

GRADUATE STUDIES CATALOG 2018–2019



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TABLE OF CONTENTS

Graduate and Professional Catalog	4	Classics (CLAS)	131
Programs	4	Communication Studies (COMM)	132
Graduate Certificates	4	Community and Regional Planning (CRPL)	134
Post-Baccalaureate Teacher Certification	12	Community Development (CDEV)	137
Courses	20	Computer Science and Engineering (CSCE)	142
Accounting (ACCT)	22	Construction Engineering (CONE)	151
Actuarial Science (ACTS)	26	Construction Management (CNST)	153
Advertising and Public Relations (ADPR)	28	Criminology and Criminal Justice (CRIM)	156
Agribusiness (ABUS)	30	Economics (ECON)	157
Agricultural Economics (AECN)	30	Education (EDUC)	163
Agricultural Engineering (AGEN)	33	Education and Human Sciences (CEHS)	163
Agricultural Leadership Education & Communications (ALEC)	36	Educational Administration (EDAD)	163
Agricultural Sciences (AGRI)	40	Educational Psychology (EDPS)	173
Agronomy (AGRO)	40	Electrical and Computer Engineering (ECEN)	183
Animal Science (ASCI)	49	Engineering (ENGR)	191
Anthropology (ANTH)	55	Engler Agribusiness Entrepreneurship Program (EAEP)	193
Architectural Engineering (AREN)	61	English (ENGL)	194
Architecture (ARCH)	66	Entomology (ENTO)	203
Art History and Criticism (AHIS)	72	Entrepreneurship (ENTR)	207
Art Theory and Practice (ARTP)	75	Environmental Engineering (ENVE)	207
Art-Ceramics (CERM)	76	Ethnic Studies (ETHN)	208
Art-Drawing (DRAW)	77	Finance (FINA)	209
Art-Graphic Design & Illustration (GRPH)	77	Food Science and Technology (FDST)	211
Art-Painting (PANT)	78	Forensic Science (FORS)	216
Art-Photography (PHOT)	78	French (FREN)	217
Art-Printmaking (PRNT)	79	Geography (GEOG)	219
Art-Sculpture (SCLP)	79	Geology (GEOL)	224
Art-Special Topics (ARTS)	80	Geosciences (GEOS)	229
Art-Watercolor (WATC)	80	German (GERM)	230
Astronomy (ASTR)	80	Gerontology (GERO)	233
Biological Chemistry (BIOC)	81	Graduate Business Administration (GRBA)	235
Biological Sciences (BIOS)	83	Graduate College (GRDC)	238
Biological Systems Engineering (BSEN)	94	Great Plains Study Program (GPSP)	239
Biomedical Engineering (BIME)	97	Greek (GREK)	239
Broadcasting (BRDC)	97	Hebrew (HEBR)	239
Chemical and Biomolecular Engineering (CHME)	99	History (HIST)	239
Chemistry (CHEM)	102	Horticulture (HORT)	248
Child, Youth and Family Studies (CYAF)	110	Hospitality, Restaurant and Tourism Management (HRTM)	254
Civil Engineering (CIVE)	124	Human Sciences (HUMS)	255
		Industrial and Management Systems Engineering (IMSE)	256
		Integrative Biomedical Sciences (IBMS)	256
		Interior Design (IDES)	256

Journalism & Mass Communications-New Core (JOMC)	257
Journalism (JOUR)	258
Journalism - Graduate (JGRD)	259
Judaic Studies Program (JUDS)	261
Landscape Architecture (LARC)	261
Latin (LATN)	261
Law (LAW)	261
Life Sciences (LIFE)	316
Management (MNGT)	316
Marketing (MRKT)	320
Materials Engineering (MATL)	323
Mathematics (MATH)	325
Mechanical Engineering (MECH)	334
Mechanized Systems Management (MSYM)	342
Medieval and Renaissance Studies (MRST)	344
Meteorology (METR)	345
Modern Languages (MODL)	349
Music (MUSC)	350
Music - Applied (MUAP)	360
Music - Composition (MUCP)	363
Music - Ensembles (MUEN)	363
Music - Opera (MUOP)	366
Music Education (MUED)	366
Music Ensemble (credit only) (MUCO)	369
Music Ensemble (degree credit) (MUDC)	369
Natural Resources (NRES)	370
Nutrition and Health Sciences (NUTR)	382
Philosophy (PHIL)	388
Physics (PHYS)	391
Plant Health Program (DPLH)	393
Plant Pathology (PLPT)	394
Political Science (POLS)	395
Psychology (PSYC)	398
Raikes School of Computer Science and Management (RAIK)	405
Religious Studies Program (RELG)	406
Russian (RUSS)	406
Science Literacy (SCIL)	407
Social Work (SOCW)	407
Sociology (SOCI)	407
Spanish (SPAN)	411
Special Education (SPED)	414

Speech-Language Pathology and Audiology (SLPA)	424
Statistics (STAT)	430
Supply Chain Management and Analytics (SCMA)	436
Survey Research and Methodology (SRAM)	438
Teaching, Learning and Teacher Education (TEAC)	440
Textiles, Merchandising and Fashion Design (TMFD)	468
Theatre Arts (THEA)	475
Turfgrass and Landscape Management (TLMT)	480
Veterinary and Biomedical Sciences (VBMS)	480
Veterinary Medicine (VMED)	484
Water Science (WATS)	487
Women's and Gender Studies Program (WMNS)	487
Graduate Studies Policies	490
General	490
Conduct, Academic Integrity, and Related Policy	490
Governance	491
Guidelines for Good Practice in Graduate Education	491
Admission	494
Admission Categories	495
Admission into Concurrent or Combined Programs	496
Admission of Faculty and Staff	496
Admission of International Students	497
Registration, Credit, and Grades	497
Academic Leave of Absence	498
Grades (Including In Progress and Incomplete)	499
Graduate Credit	500
Registration Requirements	501
Tuition and Fees	502
Academic Program Requirements	503
Majors, Minors, and More	503
Doctoral Degrees	504
Master's Degrees	508
Educational Specialist Degree	509
Certificate Programs	510
Probation and Termination	510
Funding	511
Assistantships	511
Fellowships	513
Loans and Need-Based Funding	513
Faculty	514
Professional Studies Policies	515
Archived Catalogs	515

Index	516
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GRADUATE AND PROFESSIONAL CATALOG

Most post-baccalaureate study at the University of Nebraska-Lincoln is overseen by the Office of Graduate Studies and covered by Graduate Studies Policies (p. 490). A few programs are instead covered by Professional Studies Policies (p. 515) (Master of Architecture, Doctor of Veterinary Medicine, Doctor of Plant Health), and Law has its own catalog (<https://catalog.unl.edu/law>).

Programs

Graduate Programs

Entering a program: What's offered and how to apply. Graduate Programs by College (<http://www.unl.edu/gradstudies/prospective/programs/colleges>) (outside this catalog) lists current offerings by level and major, linked to summary pages with application requirements, specializations, contacts, and more. This catalog contains related policy details, primarily in the Graduate Studies: Admission (p. 494) section.

Progressing through a program: Milestones, courses, and other requirements for completion.

- Degree programs: See Steps to Degree Completion (<http://www.unl.edu/gradstudies/current/degrees>) (outside this catalog) for overall milestones and deadlines, with links to related policy details in this catalog. Additional **program-specific requirements** are managed by academic departments; consult an advisor for details.
- Non-degree programs:
 - Graduate Certificates (p. 4)
 - Teacher Certification (p. 12)

Professional Programs

For details, refer to program websites or consult an advisor.

- Master of Architecture (<http://architecture.unl.edu/prospective-student/professional-programs>)
- Doctor of Veterinary Medicine (<http://vetmed.unl.edu>) (with Iowa State University)
- Doctor of Plant Health (<http://dph.unl.edu>)
- See also: Law Catalog (<https://catalog.unl.edu/law>)

Graduate Certificates

Agricultural Sciences and Natural Resources

Advanced Horticulture

To earn the Graduate Certificate in Advanced Horticulture:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_AdvancedHorticulture)
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours from the following course list, with a grade of B or higher in all courses.

Choose from

HORT 824	Plant Nutrition and Nutrient Management	3
HORT 843E	Advanced Interiorscaping	3
HORT 843K	Advanced Arboriculture	3
HORT 844A	Environmental Nursery Production Practices	3
HORT 844E	General Viticulture	3
HORT 888	Business Management for Agricultural Enterprises	3
HORT 842E	Floral Crops Production and Handling	2
or HORT 843A	Greenhouse Crop Production	
HORT 842B	Plant Physiology	3
or HORT 842J	Water Issues in Lawn and Landscape	

Floriculture and Nursery Production Management

To earn the Graduate Certificate in Floriculture and Nursery Production Management:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_Floriculture)
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as outlined here, with grades of B or higher in all classes. Only 1 course per "or" group below may be applied toward this certificate.

Core Courses (min 5 cr)

HORT 824	Plant Nutrition and Nutrient Management	
or HORT 842	Plant Physiology	
HORT 842E	Floral Crops Production and Handling	
or HORT 843A	Greenhouse Crop Production	
or HORT 844A	Environmental Nursery Production Practices	
Electives (min 7 cr)		
HORT 843B	Seed Sciences	3
HORT 843E	Advanced Interiorscaping	3
HORT 844B	Environmental Stress Physiology	1
HORT 888	Business Management for Agricultural Enterprises	3
ENTO 803	Management of Horticultural Crop Insects	3
or ENTO 812	Entomology and Pest Management	
or ENTO 813	Biological Control of Pests	
or ENTO 820	Insecticide Toxicology	
AGRO 896	Independent Study	1-6
or ENTO 896	Independent Study in Entomology	
or HORT 842A	Plant Pathology	

Food Safety and Defense

To earn the Graduate Certificate in Food Safety and Defense:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_FoodSafety).
2. Consult an advisor to develop a plan of study.
3. Complete a minimum of 12 credit hours, with 9 credit hours in core courses and a minimum of 3 elective credit hours.

Core Courses (9 cr)		
FDST 871	A Multidisciplinary Overview of Food Safety and Security (Kansas State Univ)	2
FDST 805	Food Microbiology (Univ of Nebraska)	3
FDST 872	Principles of Hazard Analysis and Critical Control Point System (Kansas State Univ)	2
FDST 873	Food-borne Toxicants (Iowa State Univ)	2
Electives (minimum 3 cr)		
FDST 855	Microbiology of Fermented Foods (Univ of Nebraska, 2 cr)	2
FDST 874	Food Laws, Regulations, and the Regulatory Process (Iowa State Univ, 2 cr)	2
FDST 875	Rapid Methods in Food Microbiology (Kansas State Univ, 2 cr)	2
FDST 876	Risk Assessment for Food, Agriculture, and Veterinary Medicine (Iowa State Univ, 3 cr)	3
FDST 877	Advanced Food Microbiology and Biotechnology (Univ of Missouri-Columbia, 3 cr)	3

Grassland Management

To earn the Graduate Certificate in Grassland Management:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_GrasslandManagement).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as planned. Coursework may be transferred in on a case-by-case basis with approval of the student's advisor.

Available Courses

AGRO 843	Ecology of Invasive Species	3
AGRO 846	Forage Quality	3
AGRO 847	Grassland Fire Ecology	3
AGRO 848	Grassland Monitoring and Assessment	2
AGRO 849	Watershed Management in Grasslands	3
AGRO 851	Grassland Plant Identification	2

Ornamentals, Landscape, and Turf

To earn the Graduate Certificate in Ornamentals, Landscape, and Turf:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_Landscape).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here, with grades of B or higher in all classes.

Core Courses (minimum 6 cr)

HORT 824	Plant Nutrition and Nutrient Management	3
or HORT 842B	Plant Physiology	
or HORT 842J	Water Issues in Lawn and Landscape	
HORT 843K	Advanced Arboriculture	3
Electives (minimum 6 cr)		
HORT 814	Turfgrass Disease Management	1
HORT 843J	Herbicide Action	4
HORT 844B	Environmental Stress Physiology	1
HORT 880	Modified Rootzones	1

HORT 888	Business Management for Agricultural Enterprises	3
HORT 813	Turfgrass and Landscape Weed Management	1
or HORT 843M	Weed Science	
ENTO 803	Management of Horticultural Crop Insects	3
or ENTO 812	Entomology and Pest Management	
or ENTO 813	Biological Control of Pests	
or ENTO 820	Insecticide Toxicology	
AGRO 896	Independent Study	1-6
or ENTO 896	Independent Study in Entomology	
or HORT 842A	Plant Pathology	

Arts and Sciences

Digital Humanities

To earn the Graduate Certificate in Digital Humanities:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_DigitalHumanities).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here. The certificate program is comprised of interdisciplinary coursework between English, History, and Modern Languages, and requires an internship component. Two specific courses are required; the remaining six credit hours may be drawn from courses approved by the Certificate Program Advisor. Examples of regularly taught courses that may be easily applied toward the certification are included below.

Required Courses

MODL 946 / HIST 946 / ENGL 946	Interdisciplinary Readings in Digital Humanities	3
HIST 895 / ENGL 895 / MODL 895	Internship in Digital Humanities	3

Example Electives (6 cr needed)

ANTH 935	Seminar in Archaeology	3
ENGL 878 / ENGL 478	Digital Archives and Editions	3
ENGL 898 / ENGL 498	Special Topics	1-6
HIST 870	Digital History	4
HIST 970	Seminar in Digital History	3

Geographic Information Science

To earn the Graduate Certificate in Geographic Information Science:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_GeographicInformationScience)
2. Consult an advisor to develop a plan of study.
3. Complete 22 credit hours and a comprehensive examination. These must include the following unless a student can demonstrate that he/she has previously taken equivalent courses or has professional experience that would provide equivalent training.

Core Courses

GEOG 812 / NRES 812	Introduction to Geographic Information Systems	4
GEOG 818 / NRES 818	Introduction to Remote Sensing	4
GEOG 827	Introduction to the Global Positioning System (GPS)	2
GEOG 898	Advanced Special Problems	1-24
Electives		
GEOG 817	Cartography II: Electronic Atlas Design and Production	3
GEOG 819 / AGRO 819 / GEOL 819	Applications of Remote Sensing in Agriculture and Natural Resources	4
GEOG 820	Digital Image Analysis of Remote Sensing Data	4
GEOG 822	Advanced Techniques in Geographic Information Systems	4
GEOG 844	Geo-demographic and Geographic Information Systems (GIS)	3
GEOG 922	Seminar in Geographic Information Systems (GIS)	3
CIVE 853	GIS in Water Resources	3
CIVE 962	Application of Geographic Information Systems GIS to Transportation	3
CRPL 830	Planning with GIS	3
CRPL 895	Selected Topics in Community and Regional Planning	1-9
CRPL 832	Advanced Spatial Analysis with GIS	3
CRPL 833	GIS in Environmental Design and Planning	3
STAT 831	Spatial Statistics	3

Teaching of Writing

To earn the Graduate Certificate in Teaching of Writing:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_TeachingOfWriting)
2. Consult an advisor to develop a plan of study.
3. Complete 5 courses as listed below for a total of 15-18 credit hours, which may include up to 6 cr outside the English Department.

Required: Take at least one

ENGL 857A	Composition and Rhetorical Theory
ENGL 957	Composition Theory and Practice
ENGL 957B	Nebraska Writing Project

Electives in English

ENGL 857	Composition Theory and Practice
ENGL 857B	Nebraska Writing Project
ENGL 875	Rhetoric
ENGL 875A	Rhetorical Theory: Rhetoric of Women Writers
ENGL 895	Internship in Teaching English
ENGL 895A	Nebraska Writing Project Internship
ENGL 880	Writing Center Theory, Practice, and Research

ENGL 882 Literacy Issues and Community

ENGL 973 Seminar in Literacy Studies

ENGL 976 Seminar in Rhetorical Theory

ENGL 992B Place Conscious Teaching

Other Electives (maximum 6 cr)

TEAC 813 Studies in Teaching English as a Second Language

TEAC 818 Teaching Writing in K-12 Schools

TEAC 838 Linguistics for the Classroom School Teacher

TEAC 840 Culture and Schooling

TEAC 921 Seminar in Literacy Studies

TEAC 944A Curriculum as Aesthetic Text

TEAC 950 Contextual Research in English/Language Arts

TEAC 952 Language and Learning

TEAC 953 Seminar on Writing in the Curriculum

Business Administration**Business Analytics**

To earn the Graduate Certificate in Business Analytics:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_BusinessAnalytics).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as listed below, in this sequence starting with GRBA 851. (Exception: Certificate applicants admitted in 2014 may begin the sequence with ECON 817 and take GRBA 851 in the summer.)

Required courses

GRBA 851	Business Analytics	3
ECON 817	Introductory Econometrics	3
MRKT 850	Data Driven Marketing Strategy	3
SCMA 853	Business Data Mining and Descriptive Analytics	3

Supply Chain Management Systems

To earn the Graduate Certificate in Supply Chain Management Systems:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_SupplyChain)
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours: GRBA 815 plus 3 of the other 4 courses listed, with a grade of C or better in each.

Required

GRBA 815	Supply Chain Management Strategies	3
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Elective: Take 3 of the following 4

SCMA 831	Advanced Enterprise Systems	3
SCMA 832	Planning and Controlling Supply Chain Systems	3

SCMA 834	Advanced Topics in Lean Supply Chain Management	3
SCMA 844	Managing Logistics in the Supply Chain	3

Survey Research and Methodology

To earn the Graduate Certificate in Survey Research and Methodology:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_SRAM)
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours (1 required course plus 3 of the 4 electives) as described here.

Required

SRAM 865 / SOC1 865	Survey Design and Analysis	3
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Elective: Take 3 of the following 4

SRAM 816	Principles of Survey Analysis	3
SRAM 818 / SOC1 818	Data Collection Methods	3
SRAM 819 / SOC1 819	Applied Sampling	3
SRAM 947 / SOC1 947 / PSYC 947	Questionnaire Design	3

Education and Human Sciences

Behavior Specialist

To earn the Graduate Certificate in Behavior Specialist:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_BehaviorSpecialist).
2. Consult an advisor to develop a plan of study.
3. Complete 18 credit hours as listed below, with a grade of B- or higher in all classes.

Required Courses

SPED 809	Autism Spectrum Disorders (ASDs): Effective Assessment and Intervention	3
SPED 824	Functional Behavioral Assessment	3
SPED 843	Characteristics of Emotional & Learning Disorders	3
SPED 907B	Seminar in Special Education - Behavior Disorders	1-3
SPED 954	School Mental Health and Behavior Interventions	3
SPED 942	Strategic Interventions for Students with Behavioral Needs	1-3

Community College Leadership

To earn the Graduate Certificate in Community College Leadership:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_CommunityCollegeLeadership).

2. Consult an advisor to develop a plan of study.
3. Complete 15 credit hours as described here.

Required Courses

EDAD 923	The Community/Junior College	3
EDAD 929	Organizational Development and Change	3
EDAD 935	Workforce, Economic, and Community Development	3
EDAD 934	Teaching and Learning in the Community College	3
EDAD 912B	Emerging Issues in Community College Leadership	3

Early Childhood Special Education

To earn the Graduate Certificate in Early Childhood Special Education:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_EarlyChildhoodSpecialEd).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as listed below, with grades of B= or higher in all courses.

Required Courses

SPED 860	Issues in Early Childhood Special Education	3
SPED 861 or SPED 862	Infants with Disabilities and Home Visiting Preschool Children with Disabilities in a Classroom	3
SPED 960	Family and School Collaboration in Special Education	3
SPED 863 or SPED 882	Medically Fragile infants Specialized Instruction for Students with Severe and Multiple Disabilities	3

Early Literacy

To earn the Graduate Certificate in Early Literacy:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_EarlyLiteracy).
2. Consult an advisor to develop a plan of study.
3. Complete 15 credit hours as described below, with an overall minimum GPA of 3.0. Only one course per "or" group may be applied toward the certificate.

Required

TEAC 802	Contemporary Children's Literature: Principles and Practices	3
TEAC 854	Literature in Education	1-9
TEAC 817	Emerging Reading and Language	3
TEAC 813A or TEAC 811	Second Language Acquisition Reading Processes and Practices	1-3

Electives (choose 2)

CYAF 874	Assessment in Early Childhood	3
PSYC 889	Child Behavior and Development	3
TEAC 811	Reading Processes and Practices	1-6
TEAC 836A	Professional Development: Literacy Coaching	3

TEAC 890	Workshop Seminar (section must be approved by advisory committee)	1-12
SLPA 887	Language and Learning Disorders	3
SPED 802	Advanced Assessment Techniques	3
SPED 805	Code-based Reading Instruction	1-3
SPED 815	Reading and Writing Disabilities: Elementary Students	2
or SPED 815A	Practicum in Reading and Writing Disabilities-Elementary	
SPED 890	Workshop Seminar	1-12

Family Financial Planning

To earn the Graduate Certificate in Family Financial Planning:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_FamilyFinancialPlanning).
2. Consult an advisor to develop a plan of study.
3. Complete 18 credit hours as listed here.

Required Courses

CYAF 821	Insurance Planning for Families	3
CYAF 823	Estate Planning for Families	3
CYAF 828	Retirement Planning, Employee Benefits and the Family	3
CYAF 836	Financial Planning Case Studies	3
CYAF 840	Personal Income Taxation	3
CYAF 883	Investing for the Family's Future	3

Financial & Housing Counseling

To earn the Graduate Certificate in Financial & Housing Counseling:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_FinHousingCounseling)
2. Consult an advisor to develop a plan of study.
3. Complete 18 credit hours as listed below.

Required Courses

CYAF 825	Reading in the Content Area	3
CYAF 822	Financial Counseling	3
CYAF 824	Fundamentals of Financial Planning	3
CYAF 841	Housing/Real Estate	3
Electives: Choose 2 courses (6 cr)		
CYAF 821	Insurance Planning for Families	3
CYAF 823	Estate Planning for Families	3
CYAF 826	Military Personal Financial Readiness	3
CYAF 828	Retirement Planning, Employee Benefits and the Family	3
CYAF 840	Personal Income Taxation	3
CYAF 883	Investing for the Family's Future	3
CYAF 897B	Practicum in Family Financial Planning	3-6

K-3 Mathematics Specialist

To earn the Graduate Certificate in K-3 Mathematics Specialist:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_MathSpecialist).
2. Consult an advisor to develop a plan of study.
3. Complete 18 credit hours as described: the prerequisite course, then the 5 required courses.

Prerequisite

MATH 800P	Number and Operation for K-3 Mathematics Specialists	3
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Required Courses

MATH 801P	Geometry, Measurement, and Algebraic Thinking for K-3 Mathematics Specialists	3
MATH 802P	Number, Geometry and Algebraic Thinking II for K-3 Math Specialists	3
TEAC 808A	Improvement of Instruction in School Mathematics Primary: K-3	3
TEAC 808J	Improvement of Instruction in School Mathematics Special Topics	3
TEAC 907	Seminar in Elementary School Mathematics	3

Medical Family Therapy

To earn the Graduate Certificate in Medical Family Therapy:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_MedicalFamilyTherapy).
2. Consult an advisor to develop a plan of study. There are two approaches to completing this certificate:
 - **Approach A:** Those who hold a qualifying degree will be able to complete the certificate program within one year by taking the four core courses and practicum. For information on qualifying degrees and prerequisites, contact the department.
 - **Approach B:** Those who do not hold a qualifying degree may complete the certificate as a standalone non-degree objective or as part of the Child, Youth and Family Studies master's degree with a specialization in Marriage and Family Therapy. Requirements:
 - The core courses and practicum (as for option A)
 - The seven "other required courses" listed below
 - Nine credit hours in individual development and family relations. Courses offered through UNL, UNMC, UNO, and other institutions will be considered on an individual basis. Courses from the UNL Marriage and Family Therapy Program which fulfill this include: CYAF 872, 881, 882, 883, 888, 980, 984.
3. Complete 15 (option A) or 45 (option B) credit hours as described here.

Core Courses and Practicum

CYAF 951	Theoretical Foundations of Marriage and Family Therapy	3
FMED 741:	Theory and Practice of Medical Family Therapy (UNMC)	3
FMED 742:	Families, Health, and Illness (UNMC)	3

FMED 743: Applied Medical Family Therapy (UNMC)	3
FMED 744: Clinical Practicum (UNMC)	3
Other Required Courses	
CYAF 952 Psychopathology and Dysfunctional Interactions	3
CYAF 954 Assessment in Family Therapy	3
CYAF 955 Clinical Family Therapy (Must take both 955A and 955B)	3
CYAF 956 Couples and Sex Therapy	3
CYAF 953 Issues and Ethics for Family Professionals	3
CYAF 865 Research Design and Methods	3
Individual development and family relations (9 cr, courses vary)	

Mixed Methods Research

To earn the Graduate Certificate in Mixed Methods Research:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_MixedMethodsResearch).
2. Consult an advisor to develop a plan of study. Participants must complete two statistics courses, one measurements course, two qualitative methods courses, and one mixed methods course. See EDPS QQPM courses (<http://cehs.unl.edu/documents/edpsych/QQPM Sched2015-19.pdf>) for details about when these are offered. With advisor and committee approval, students may transfer in three credit hours in either the Statistics area or the Qualitative Methods area; credit hours must be from an accredited institution.
3. Complete 18 credit hours as described here, with a grade of B or better in each course.

Statistics: Choose 2 courses (6 cr)

EDPS 859 Statistical Methods ¹	3
EDPS 860 Applications of Selected Advanced Statistics ¹	3
EDPS 941 Intermediate Statistics: Experimental Methods	3
EDPS 942 Intermediate Statistics: Correlational Methods	3
EDPS 971 Structural Equation Modeling	3
EDPS 972 Multivariate Analysis	3

Measurement: Choose 1

EDPS 870 Introduction to Educational and Psychological Measurement ¹	3
EDPS 970 Theory and Methods of Educational Measurement	3

Qualitative Methods: Choose 2 courses (6 cr)

EDPS 900K Qualitative Approaches to Educational Research ¹	3
EDPS 935 Seminar in Qualitative Research ¹	3
EDPS 930A Ethnographic Methods	1-3
EDPS 930D Discourse Analysis Across School, Home and Community Settings	1-3

Mixed Methods: Choose 1

EDPS 936 Mixed Methods Research ¹	3
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¹ EDPS 859, EDPS 860, EDPS 870, EDPS 900K, EDPS 935, and EDPS 936 may be completed online.

Nutrition, Non-coding RNAs, and Extracellular Vesicles (N2V)

To earn the Graduate Certificate in Nutrition, Non-coding RNAs, and Extracellular Vesicles (N2V):

1. Apply and get admitted toward this certificate objective.
2. Consult an advisor to develop a plan of study.
3. [Course and credit hour requirements coming soon...]

Quilt Studies

To earn the Graduate Certificate in Quilt Studies:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_QuiltStudies).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here: three required courses and one elective approved by the Certificate Program Advisor.

Required Courses

TMFD 818 Quilts, History, Culture	3
TMFD 905A Advanced Problems: Textiles	1-6
TMFD 905D Advanced Problems: Design	1-6

Elective (3 cr): Examples of regularly taught courses that may be applied:

TMFD 997 Internship	1-9
TMFD 978 Seminar in Textile History (Various topics offered as 1-week summer seminars. E.g., Colonial Revival Quilts, Quilts of the Depression Era, A Century of Quilts in Women's Lives, 18th and 19th Century Dyeing and Printing Techniques, Quilts of India and Pakistan, Repair and Stabilization of Quilts.)	1-3
TMFD 890 Workshop/Seminar (Craft, Culture, and Fashion)	1-3

Reading Intervention

To earn the Graduate Certificate in Reading Intervention:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_ReadingIntervention).
2. Consult an advisor to develop a plan of study.
3. Complete 13-15 credit hours as described here: two core courses, one required workshop, and two other TEAC/SPED courses.

Required Courses

TEAC 811B Special Topics in Reading (Response to Intervention)	1-6
SPED 802 Advanced Assessment Techniques	3
TEAC 893 Workshop Seminar (Response to Intervention)	1-12

Elective: Choose two courses (6-8 cr)

TEAC 811 Reading Processes and Practices (other than Response to Intervention)	1-6
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TEAC 806	Reading and Writing Disabilities: Adolescents	2	TEAC 813M	Teaching Multilingual Learners in Content Areas	3
TEAC 806A	Reading Center Practicum II	2	TEAC 833A	Comparative Education Survey	3
TEAC 836A	Professional Development: Literacy Coaching	3	TEAC 833B	Comparative Education: Special Topics/Travel Study	3-9
TEAC 838	Linguistics for the Classroom School Teacher	3	TEAC 897E	Student Teaching Internship: English as a Second Language	1-10
TEAC 886	Assessment, Evaluation, and Instruction of At-Risk Readers (specific section must be approved for inclusion by the advisory committee)	1-3	TEAC 838	Linguistics for the Classroom School Teacher	3
TEAC 886B	Internship in Literacy Assessment and Instruction	1-3	TEAC 921D	Seminar in Literacy Studies: Language, Culture, and Education	1-9
TEAC 890	Workshop Seminar	1-12			

Sensory Disabilities

To earn the Graduate Certificate in Sensory Disabilities:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_SensoryDisabilities).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here.

Required Courses

SPED 846	Foundations of Visual Impairment: Programs and Services for Individuals with Visual Impairments	3
SPED 872	Psychology and Sociology of Deafness	3
SPED 960	Family and School Collaboration in Special Education	3
SPED 852	Instructional Methods for Teachers of Students with Visual Impairments	3
or SPED 873	Deaf or Hard of Hearing: Content Methods	

Teaching English to Speakers of Other Languages

To earn the Graduate Certificate in Teaching English to Speakers of Other Languages:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_TeachingEnglish).
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here: 4 courses at 3 credit hours each, maintaining a 3.25 GPA for these courses and earning a grade of B or better in each course. Up to 6 credit hours of relevant previous coursework may be applied.

Required Courses

TEAC 813A	Second Language Acquisition	1-3
TEAC 813K	Linguistics for Language Teachers	1-3, 3
TEAC 813P	Teaching English as an International Language	3
Elective: Take at least 1 of these courses		
TEAC 813D	World Languages Assessment	1-3
TEAC 813E	Special Topics in TESOL	1-6
TEAC 813J	Intercultural Communication	3

TEAC 813M	Teaching Multilingual Learners in Content Areas	3
TEAC 833A	Comparative Education Survey	3
TEAC 833B	Comparative Education: Special Topics/Travel Study	3-9
TEAC 897E	Student Teaching Internship: English as a Second Language	1-10
TEAC 838	Linguistics for the Classroom School Teacher	3
TEAC 921D	Seminar in Literacy Studies: Language, Culture, and Education	1-9

Transdisciplinary Childhood Obesity Prevention

To earn the Graduate Certificate in Transdisciplinary Childhood Obesity Prevention:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_ChildhoodObesity).
2. Consult an advisor to develop a plan of study.
3. Complete 14 credit hours as described here, with a grade of B- or better in each course. Participants must also complete a PhD or MS. *With permission, substitutions of equivalent courses may be accepted.*

Required Courses

NUTR 810	Transdisciplinary Obesity Prevention	3
NUTR 910	Research Planning and Grant Writing for Childhood Obesity	3
NUTR 986	Graduate Seminar	1-2
NUTR 911	Practicum: Experiential Learning Experiences in Childhood Obesity Prevention	1

Graduate-level statistics course

Elective: Choose one

EDPS 800	Foundations of Educational Research	3
NUTR 805	Research Methods	3
CYAF 865	Research Design and Methods	3

World Language Teaching: German

To earn the Graduate Certificate in World Language Teaching: German:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_TeachingGerman)
2. Consult an advisor to develop a plan of study.
3. Complete 15 credit hours as described below.

Choose any 5 of these:

TEAC 922	Seminar in the Learning and Teaching of Foreign Languages	3
TEAC 922C	The Interpretive Mode: Reading and Listening in the German Language Classroom (formerly 922B)	3
TEAC 922G	Interpersonal and Presentational Writing in the German Language Classroom (formerly 922F)	3
TEAC 922P	Assessment in the German Language Classroom (formerly 922O)	3

TEAC 922T	Planning in the German Language Classroom (formerly 922S)	3
TEAC 922X	Technology-Enhanced German Language Instruction (formerly 922W)	3
TEAC 922Z	Teaching for Intercultural Communicative Competence in the Foreign Language Classroom	3

World Language Teaching: Spanish

To earn the Graduate Certificate in World Language Teaching: Spanish:

1. Apply and get admitted toward this certificate objective. (http://www.unl.edu/gradstudies/prospective/programs/Cert_TeachingSpanish)
2. Consult an advisor to develop a plan of study.
3. Complete 15 credit hours as described below.

Choose any 5 of these:

TEAC 922	Seminar in the Learning and Teaching of Foreign Languages	3
TEAC 922B	The Interpretive Mode: Reading and Listening in the Spanish Language Classroom	3
TEAC 922F	Interpersonal and Presentational Writing in the Spanish Language Classroom	3
TEAC 922O	Assessment in the Spanish Language Classroom	3
TEAC 922S	Planning in the Spanish Language Classroom	3
TEAC 922W	Technology-Enhanced Spanish Language Instruction	3
TEAC 922Z	Teaching for Intercultural Communicative Competence in the Foreign Language Classroom	3

Youth Development

To earn the Graduate Certificate in Youth Development:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_YouthDevelopment).
2. Consult an advisor to develop a plan of study and choose a focus: Youth Development Specialist or Youth Program Management and Evaluation.
3. Complete 13 credit hours as described here: a one-hour foundations course plus 12 hours listed below. *Some courses listed here require admission to a Child, Youth and Family Studies graduate degree program or permission.*

May be applied to either focus

CYAF 878	Youth Policy (Michigan State Univ)	3
CYAF 880	Contemporary Youth Issues (Various topics; UNL, Kansas State Univ, Texas Tech Univ, or North Dakota State Univ)	3

Required for the Youth Development Specialist focus

CYAF 861	Foundations of Youth Development (at home univ)	1
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CYAF 864	Community Youth Development (Michigan State Univ)	3
CYAF 868	Adolescents and Their Families (UNL or Kansas State Univ)	3
CYAF 872	Youth Development (UNL or North Dakota State Univ)	3
CYAF 875	Youth in Cultural Contexts (Michigan State Univ)	3

Required for the Youth Program Management and Evaluation focus

CYAF 861	Foundations of Youth Development (at home univ)	1
CYAF 873	Program Design, Evaluation and Implementation (UNL)	3
CYAF 863	Youth Professionals as Consumers of Research (UNL)	3
CYAF 869	Administration and Program Management (UNL or Kansas State Univ)	3

Engineering

Construction Engineering & Management

To earn the Graduate Certificate in Construction Engineering & Management:

1. Apply and get admitted toward this certificate objective.
2. Consult an advisor to develop a plan of study.
3. *[Course and credit hour requirements coming soon...]*

Fine and Performing Arts

Music Entrepreneurship

To earn the Graduate Certificate in Music Entrepreneurship:

1. Apply and get admitted toward this certificate objective.
2. Consult an advisor to develop a plan of study.
3. Complete 12 credit hours as described here. These courses are offered each fall and spring term, with the business courses (ENTR) also offered in summer. *Although these are not part of the regular Master of Music program, they may be used as electives in some master's or doctoral programs in Music.*

MUSC 898	Special Topics in Music	3
ENTR 821	Initiating and Managing Entrepreneurial Growth	3
ENTR 822	Managing Rapid Growth and Change in Organizations	3
MUSC 894	Music Internship	1-3

Journalism and Mass Communications

Public Relations and Social Media

To earn the Graduate Certificate in Public Relations and Social Media:

1. Apply and get admitted toward this certificate objective (http://www.unl.edu/gradstudies/prospective/programs/Cert_PublicRelations).
2. Consult an advisor to develop a plan of study.

3. Complete 12 credit hours as described here, with grades of B or higher in all classes.

Required courses

ADPR 830	Strategic Communications: Advertising Issues and Strategies	3
ADPR 834	Digital Insight & Analytics	3
ADPR 850	Public Relations Theory and Strategy	3
ADPR 866	Social Media Theory and Practice	3

Post-Baccalaureate Teacher Certification

Students who already hold a bachelor's degree may pursue Nebraska Department of Education (NDE) Teacher Certification (<https://www.education.ne.gov/tcert>)—including endorsements and administrative certificates—at the graduate level.

- Preparation:** Consult UNL's Certification Officer (<http://cehs.unl.edu/cehs/applying-your-teaching-certificate>) or the relevant academic department to ensure that you understand the requirements and know what to select when you apply.
- Application:** Apply via the Application for Admission to Graduate Study (<http://go.unl.edu/gradapp>) and get admitted.
- Progress and completion:** Consult an advisor, then enroll and complete requirements as described. Questions about specific certifications and their requirements should be directed to the departments listed as contacts. For broader questions about completing NDE requirements at UNL, contact UNL's Certification Officer.

Administrative Endorsements

Curriculum Supervisor (Grades PK-12) (36 cr)

Contact: Departments of Educational Administration, 402-472-3728, and Teaching, Learning and Teacher Education, 402-472-2231.

This is an Administrative Certificate/Endorsement that requires the completion of 36 graduate credit hours. For admission to the master's degree or certificate program and to be recommended for administrative certification and endorsement, students must also satisfy additional NDE state requirements, including but not limited to, possession of a valid Regular Teaching Certificate, evidence of two years of successful teaching experience, human relations training, special education training, and basic skills competency. Candidates must apply to both the Department of Educational Administration and to the Department of Teaching Learning and Teacher Education.

EDAD 811	Principal Practicum	3
EDAD 830	Administrative Theory in Educational Organizations	3
EDAD 851	Faculty and Staff Appraisal	3
EDAD 903	Issues in Community Relations	3
EDAD 948	Instructional Leadership: Emerging Trends and Practices	3
Select one of the following:		3
EDAD 833	Educational Finance	
EDAD 837	Education Law	
EDAD 852	School Culture and Student Behavior	

TEAC 800	Inquiry into Teaching and Learning	3
TEAC 801	Curriculum Inquiry	3
TEAC 888	Teacher as Scholarly Practitioner	3
Select two of the following approved graduate courses:		6
TEAC 846A	The Middle Level Curriculum	
TEAC 846B	Studies in Middle Level Schooling: Leadership	
TEAC 848	Introduction to Curriculum Studies	
TEAC 944	Seminar in Curriculum Studies	
TEAC 944A	Curriculum as Aesthetic Text	
TEAC 944B	Special Topics in Curriculum	
TEAC 944D	Curriculum Evaluation	
TEAC 944E	Curriculum as Spatial Text	
Select one of the following foundations of education:		3
TEAC 830	Introduction to Philosophy of Education	
TEAC 831	Studies in the Foundations of Education	
TEAC 832	Higher Education in America	
TEAC 834	Ethics and Education	
TEAC 840	Culture and Schooling	
TEAC 840A	Culture and Schooling: Gender	
TEAC 840B	Culture and Schooling: Gender and Science	
TEAC 840D	Culture and Schooling: Special Topics	
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	
TEAC 902	Colloquium in Educational Policy and Practice	

Total Credit Hours 36

Each student must satisfactorily complete a Professional Portfolio, approved by an advisor.

Principal (Grades PK-8 or 7-12) (36-45 cr)

Contact: Department of Educational Administration, 402-472-3728.

This is an Administrative Certificate/Endorsement that requires the completion of 36 graduate credit hours if at the same level as one's teaching endorsement or 45 cr if pursuing this endorsement at a different level.

For admission to the master's degree or certificate program and to be recommended for administrative certification and endorsement, students must also satisfy additional NDE state requirements, including but not limited to, possession of a valid Regular Teaching Certificate, evidence of two years of successful teaching experience at the relevant level, human relations training, special education training, and basic skills competency.

EDAD 811	Principal Practicum	3
EDAD 830	Administrative Theory in Educational Organizations	3
EDAD 833	Educational Finance	3
EDAD 837	Education Law	3
EDAD 851	Faculty and Staff Appraisal	3
EDAD 852	School Culture and Student Behavior	3
EDAD 903	Issues in Community Relations	3
EDAD 800	Foundations of Research and Methods of Inquiry in Educational Administration	3
Select one of the following:		3

TEAC 801	Curriculum Inquiry	
TEAC 848	Introduction to Curriculum Studies	
TEAC 944	Seminar in Curriculum Studies	
Select one of the following:		3
TEAC 800	Inquiry into Teaching and Learning	
TEAC 946	Instructional Improvement and Decision Making	
TEAC 948	Instructional Leadership: Emerging Trends and Practices	
An approved College of Education and Human Sciences course outside the departments of EDAD or TLTE		3
An elective approved by an advisor		3
Total Credit Hours		36

Each student must satisfactorily complete a Professional Portfolio approved by an advisor.

Special Education Supervisor (Birth-12)

Contact: Department of Educational Administration, 402-472-3728.

Details coming soon.

Superintendent (Grades PK-12) (66 cr)

Contact: Department of Educational Administration, 402-472-3728.

This is an Administrative Certificate/Endorsement that requires the completion of 60 graduate credit hours and completion of a specialist of doctoral program in educational administration. For admission to the six year specialist program or the Ed.D. and to be recommended for administrative certification and endorsement, students must also satisfy additional NDE state requirements, including but not limited to, possession of a valid Regular Teaching Certificate, evidence of two years of successful teaching experience, human relations training, special education training, and basic skills competency.

EDAD 801	Cross-Cultural Leadership Studies	3
EDAD 811	Principal Practicum	3
EDAD 830	Administrative Theory in Educational Organizations	3
EDAD 833	Educational Finance	3
EDAD 835	Business Management of Schools	3
EDAD 837	Education Law	3
EDAD 851	Faculty and Staff Appraisal	3
EDAD 852	School Culture and Student Behavior	3
EDAD 901	System-Level School Improvement	3
EDAD 903	Issues in Community Relations	3
EDAD 905	Issues in Governance of Educational Institutions	3
EDAD 906	Issues in System Level Administration	3
EDAD 800	Foundations of Research and Methods of Inquiry in Educational Administration	3
EDAD 987C	Superintendent Internship	3
EDAD 995	Doctoral Seminar (representing the Superintendent Academy I and II)	6
Select 3 hours of the following:		3
TEAC 801	Curriculum Inquiry	
TEAC 848	Introduction to Curriculum Studies	

TEAC 944	Seminar in Curriculum Studies	
Select 3 hours of the following:		3
TEAC 800	Inquiry into Teaching and Learning	
TEAC 946	Instructional Improvement and Decision Making	
TEAC 948	Instructional Leadership: Emerging Trends and Practices	
An approved College of Education and Human Sciences course outside the departments of EDAD or TLTE		3
Approved electives with the recommendation of no more than 6 hrs from the department of EDAD		9
Total Credit Hours		66

Each student must satisfactorily complete a Professional Portfolio, approved by an advisor.

Teaching Endorsements: Initial teacher certification at the graduate level Elementary Education (Grades K-6) (44 cr with MA; Initial, Subject, Field)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

This is a 14-month accelerated program with Master of Arts "MA+et" degree.

TEAC 893	Workshop Seminar	1
TEAC 894A	Professional Practicum Experiences: Elementary (K-6)	1
TEAC 800	Inquiry into Teaching and Learning	3
TEAC 801	Curriculum Inquiry	3
TEAC 808	Improvement of Instruction in School Mathematics	3
TEAC 811A	Teaching Reading	3
TEAC 822A	Principles and Practices in Social Studies Education: Special Topics	3
TEAC 840D	Culture and Schooling: Special Topics	3
TEAC 841	Content Area Reading, Grades 4-12	3
TEAC 842A	Objectives and Methods of Science Teaching: Elementary	3
TEAC 889	Masters Seminar	3
TEAC 890	Workshop Seminar	3
TEAC 897A	Student Teaching Internship: Elementary (K-6)	6
CYAF 971	Seminar in Child Development	3
SPED 801A	Accommodating Exceptional Learners in the Elementary School Classroom	3
Total Credit Hours		44

English Language Arts (Grades 7-12) (with MA; Field)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Details coming soon.

Family and Consumer Science Education (Grades 6-12) (90-91 cr; Initial, Field)

Contact: Department of Child, Youth and Family Studies, 402-472-8209.

CYAF 160	Human Development and the Family	3
CYAF 222	Introduction to Family Finance	3
CYAF 280	Family Science	3
CYAF 333	Families in the Economy	3
CYAF 380	Working with Families in Communities and Schools	3
CYAF 382	Working with Parents	3
CYAF 403	Student Teaching Seminar in Family and Consumer Sciences	3
CYAF 851	Learning and Teaching Principles and Practice in Family and Consumer Sciences	3
CYAF 852	Curriculum Principles and Practices in Family and Consumer Sciences	4
CYAF 894J	Professional Practicum Experiences	2
CYAF 897J	Student Teaching in Family and Consumer Sciences	10
NUTR 244	Scientific Principles of Food Preparation	3
NUTR 245	Scientific Principles of Food Preparation Laboratory	1
NUTR 250	Human Nutrition and Metabolism	3
NUTR 372	Food Safety and Sanitation	3
TMFD 123	Clothing and Society: You Are What You Wear	3
or CYAF 493	Special Topics in Contemporary Family Issues	
EDPS 851	Psychology of Adolescence	3
EDPS 854	Human Cognition and Instruction	3
EDPS 297	Professional Practicum Experiences II	1
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
TEAC 825	Work-Based Learning/Coordinating Techniques	3
Select one of the following:		3
TEAC 830	Introduction to Philosophy of Education	
TEAC 831	Studies in the Foundations of Education	
TEAC 834	Ethics and Education	
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	3
TEAC 880A	Teaching with Technology: Survey of Instructional Technology	3
Select 15-16 hours from these areas of emphasis:		15-16
<i>Nutrition and Health (15 hrs)</i>		
NUTR 100	Healthy Living	
NUTR 131	The Science of Food	
NUTR 251	Nutrition Through the Life Cycle	
NUTR 253	Cultural Aspects of Food and Nutrition	
NUTR 344	Nutrition and Food for Optimal Health	
NUTR 430	Nutritional Anthropology	
<i>Hospitality and Food Service (16 hrs)</i>		
HRTM 289	Introduction to the Event Industry	
HRTM 373	Catering	

HRTM 489	Advanced Event Operations	
NUTR 370	Food Production Management	
NUTR 371	Applied Food Production Laboratory	
<i>Textiles, Merchandising and Fashion Design (15 hrs)</i>		
TMFD 123	Clothing and Society: You Are What You Wear	
or CYAF 493	Special Topics in Contemporary Family Issues	
TMFD 206	Textiles	
TMFD 212	Product Development II: Apparel Analysis and Development	
TMFD 213	Merchandising I: Textile and Apparel Industry	
TMFD 407	History of Dress	
TMFD 408	Textiles, Technology and Culture	
TMFD 410	Body, Dress and Identity	
<i>Family Studies (15 hrs)</i>		
CYAF 285	Dating and Couple Relationships	
CYAF 322	Advanced Family Finance	
CYAF 446	Addictions and Families	
CYAF 458	Family Stress and Crisis, Coping and Recovery	
CYAF 488	Child and Family Policy	
CYAF 493	Special Topics in Contemporary Family Issues	
CYAF 495	Special Topics in Family and Cultural Diversity	
<i>Child Studies (15 hrs)</i>		
CYAF 271 & CYAF 271L	Infancy and Infancy Laboratory	
CYAF 371	Methods of Working with Infants in Programs and Communities	
CYAF 374	Curriculum Planning in Early Childhood Education	
CYAF 383	Literacy Methods for Young Children	
CYAF 384	Math, Science & Nature Integrated Methods Birth - Kindergarten:World of Wonder	
CYAF 210	Applied Methods of Social Emotional Development and Guidance	
CYAF 210L	Applied Methods of Social Emotional Development and Guidance	
CYAF 474	Assessment in Early Childhood	
<i>Health Occupations</i>		
CYAF 446	Addictions and Families	
CYAF 471	Human Sexuality and Society	
CLAS 116	Scientific Greek and Latin	
GERO 200	Introduction to Gerontology	
GERO 307	Death and Dying	
PHIL 106	Philosophy and Current Issues	

Total Credit Hours

90-91

Mathematics (Grades 7-12) (42 cr with MA; Initial, Subject, Field)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

This is a 14-month program with a Master of Arts ("MA+mt") degree. Must have a bachelor's degree in science, technology, engineering or mathematics and have completed 21 hours in mathematics at the calculus level with a grade of B or better.

TEAC 800	Inquiry into Teaching and Learning	3
TEAC 801	Curriculum Inquiry	3
TEAC 840D	Culture and Schooling: Special Topics	3
TEAC 851P	Learning and Teaching Principles and Practices: Secondary Mathematics	3
TEAC 852P	Curriculum Principles and Practices Secondary Mathematics	3
TEAC 889	Masters Seminar	3
TEAC 894P	Professional Practicum Experiences: Secondary Mathematics	2
TEAC 897P	Student Teaching Internship: Secondary Mathematics	4
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
EDPS 991	Seminar in Educational Psychology and Measurements	3
MATH 805T	Discrete Mathematics for Middle Level Teachers	3
MATH 810T	Algebra for Algebra Teachers	3
MATH 812T	Geometry for Geometry Teachers	3
MATH elective chosen with advisor		3
Total Credit Hours		42

Science (Grades 7-12) (42 cr with MA; Initial, Subject, Field)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

This is a 14-month program with a Master of Arts ("MA+st") degree. All content course requirements must be completed prior to starting the program. For a single subject endorsement (biology or chemistry or physics or earth and space science), must have 24 hrs of lab-based courses in one subject area and 12 hrs of lab-based courses distributed equally among the other three ancillary areas. For a field endorsement in science, must have 24 hrs of lab-based courses in one core subject area and a minimum of 12 hrs each of lab-based courses in the other ancillary science areas.

TEAC 800	Inquiry into Teaching and Learning	3
TEAC 801	Curriculum Inquiry	3
TEAC 803B	Student Teaching Seminar: Secondary Education	3
TEAC 813M	Teaching Multilingual Learners in Content Areas	3
TEAC 842E	Objectives and Methods of Science Teaching: Special Topics	3
TEAC 851V	Learning and Teaching Principles and Practices: Secondary Science	3
TEAC 852V	Curriculum Principles and Practices Secondary Science	3
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	3

TEAC 880A	Teaching with Technology: Survey of Instructional Technology	3
TEAC 889	Masters Seminar	3
TEAC 894V	Professional Practicum Experiences: Secondary Science	2
TEAC 897V	Student Teaching Internship: Secondary Science	4
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
EDPS 991	Seminar in Educational Psychology and Measurements	3
Total Credit Hours		42

Special Education: Early Childhood (Birth - K) (33+22 cr; Initial, Subject)

Contact: Department of Special Education and Communication Disorders at 402-472-2141.

Prerequisites: Bachelor's degree from accredited institution; acceptance into the teacher education program in CEHS and admission with full graduate standing in the master's degree program in Department of Special Education and Communication Disorders; prerequisite courses (22 cr):

EDPS 362 / EDPS 854	Learning in the Classroom	3
SPED 201	Introduction to Special Education	3
SPED 212	Assessment Techniques for Diverse Learners	3
or CYAF 474	Assessment in Early Childhood	
SPED 362	Early Childhood Special Education	3
SPED 454	Behavior Management	3
SPED 496Y	Directed Field Experience: Inclusion	1
TEAC 330 / TEAC 861	Multicultural Education	3
TEAC 331 / TEAC 831	School and Society	3
Total Credit Hours		22

Required completion (or equivalent) (33 cr):

CYAF 970	Advanced Early Childhood Education	3
SPED 860	Issues in Early Childhood Special Education	3
SPED 861	Infants with Disabilities and Home Visiting	3
SPED 862	Preschool Children with Disabilities in a Classroom	3
SPED 863	Medically Fragile infants	3
SPED 876 or SLPA 251	Language Development for Teachers Normal Language Development	3
SPED 882	Specialized Instruction for Students with Severe and Multiple Disabilities	3
SPED 896Q	Directed Field Experience: Early Childhood Special Education	3
SPED 897Q	Student Teaching: Early Childhood Special Education	3

SPED 960	Family and School Collaboration in Special Education	3
TEAC 410 / TEAC 810	Educational Program for Kindergarten Children	3
Total Credit Hours		33

Speech Language Pathologist (Birth-Grade 12) (Subj)

Contact: Department of Special Education and Communication Disorders at 402-472-2141.

Details coming soon.

World Language: French (Grades 7-12) (80 cr; Subject)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Must also enroll in a master's degree program.

FREN 101	Beginning French I	5
FREN 102	Beginning French II	5
FREN 201	Second-Year French I	3
FREN 202	Second-Year French II	3
FREN 203	Conversation and Composition I	3
FREN 204	Conversation and Composition II	3
FREN 301	Representative Authors I	3
FREN 302	Representative Authors II	3
FREN 303	Advanced Composition, Grammar, and Conversation I	3
FREN 304	Advanced Composition, Grammar, and Conversation II	3
FREN 319	French Phonetics	3
Select two of the following:		6
FREN 321	French Civilization I	
FREN 322	French Civilization II	
FREN 323	Aspects of Francophone Civilization	
One FREN 400-level course		3
EDPS 851	Psychology of Adolescence	3
EDPS 854	Human Cognition and Instruction	3
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
TEAC 803B	Student Teaching Seminar: Secondary Education	3
Select one of the following:		3
TEAC 830	Introduction to Philosophy of Education	
TEAC 831	Studies in the Foundations of Education	
TEAC 834	Ethics and Education	
TEAC 851R	Learning and Teaching Principles and Practices: Secondary Modern Languages	3
TEAC 852R	Curriculum Principles and Practices Secondary Modern Languages	3
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	3
TEAC 880A	Teaching with Technology: Survey of Instructional Technology	3
TEAC 894R	Professional Practicum Experiences: Secondary Modern Language	3

TEAC 897R	Student Teaching Internship: Secondary Modern Language	4
Total Credit Hours		80

World Language: German (Grades 7-12) (80 cr; Subject)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Must also enroll in a master's degree program.

GERM 101	Beginning German I	5
GERM 102	Beginning German II	5
GERM 201	Second-Year German I	3
GERM 202	Second-Year German II	3
GERM 203	Composition and Conversation I	3
GERM 204	Composition and Conversation II	3
GERM 301	German for Professional Purposes	3
GERM 302	Contemporary German Culture: Film, Literature, Theater	3
GERM 303	Advanced Communication: Exploring Contested Identities	3
GERM 304	Sustainability and Migration	3
GERM 321	German Civilization I	3
GERM 398	Special Topics in German	3
Two GERM 400-level courses		6
EDPS 851	Psychology of Adolescence	3
EDPS 854	Human Cognition and Instruction	3
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
TEAC 803B	Student Teaching Seminar: Secondary Education	3
Select one of the following:		3
TEAC 830	Introduction to Philosophy of Education	
TEAC 831	Studies in the Foundations of Education	
TEAC 834	Ethics and Education	
TEAC 851R	Learning and Teaching Principles and Practices: Secondary Modern Languages	3
TEAC 852R	Curriculum Principles and Practices Secondary Modern Languages	3
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	3
TEAC 880A	Teaching with Technology: Survey of Instructional Technology	3
TEAC 894R	Professional Practicum Experiences: Secondary Modern Language	3
TEAC 897R	Student Teaching Internship: Secondary Modern Language	4
Total Credit Hours		80

World Language: Spanish (Grades 7-12) (80 cr; Subject)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Must also enroll in a master's degree program.

SPAN 101	Beginning Spanish I	5
SPAN 102	Beginning Spanish II	5

SPAN 201	Second-Year Spanish I	3
SPAN 202	Second-Year Spanish II	3
SPAN 203	Intensive Conversation	3
SPAN 204	Intensive Writing	3
SPAN 303	Advanced Reading for Comprehension	3
SPAN 304	Advanced Writing	3
SPAN 319	Sound Systems of Spanish	3
SPAN 321	Exploring Hispanic Culture: Spain	3
SPAN 331	Latin American Civilization	3
SPAN 403 or SPAN 405	Syntactic Structures of Spanish Advanced Grammar	3
Select two of the following:		6
SPAN 304	Advanced Writing	
SPAN 311	Introduction to Hispanic Literature: Latin America	
SPAN 312	Representative Spanish-American Authors II	
SPAN 314	Introduction to Hispanic Literature: Spain	
SPAN 315	Representative Authors of Spain	
SPAN 317	Introduction to Linguistics	
SPAN 398	Special Topics in Spanish	
EDPS 851	Psychology of Adolescence	3
EDPS 854	Human Cognition and Instruction	3
SPED 801B	Accommodating Exceptional Learners in the Secondary School Classroom	3
TEAC 803B	Student Teaching Seminar: Secondary Education	3
Select one of the following:		3
TEAC 830	Introduction to Philosophy of Education	
TEAC 831	Studies in the Foundations of Education	
TEAC 834	Ethics and Education	
TEAC 851R	Learning and Teaching Principles and Practices: Secondary Modern Languages	3
TEAC 852R	Curriculum Principles and Practices Secondary Modern Languages	3
TEAC 861	Education for a Pluralistic Society: Foundation and Issues	3
TEAC 880A	Teaching with Technology: Survey of Instructional Technology	3
TEAC 894R	Professional Practicum Experiences: Secondary Modern Language	3
TEAC 897R	Student Teaching Internship: Secondary Modern Language	4
Total Credit Hours		80

Teaching Endorsements: Added endorsements at the graduate level Assessment Leadership (Grades P-12) (18 cr; Supplemental)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Persons with this endorsement may assist in or facilitate the development of assessment programs for students in Pre-Kindergarten through grade 12.

Must have or qualify for a standard teaching certificate and complete a master's degree or specialist program.

TEAC 894A	Professional Practicum Experiences: Elementary (K-6)	3
TEAC 894B	Professional Practicum Experiences: Elementary Art	3
TEAC 894E	Professional Practicum Experiences: English as a Second Language	3
TEAC 894J	Professional Practicum Experiences: Business Education	3
TEAC 991	Field Studies in Education	6
Total Credit Hours		18

Bilingual Education (Grades K-6, 7-12) (Supplemental)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Details coming soon.

English as a Second Language (Grades K-12) (18 cr; Supplemental)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Must have a valid initial teaching certificate or parallel with one in progress.

TEAC 813A	Second Language Acquisition	3
TEAC 813B	ESL: Teaching and Curriculum	3
TEAC 813J	Intercultural Communication	3
TEAC 813K or TEAC 838	Linguistics for Language Teachers Linguistics for the Classroom School Teacher	3
TEAC 813M	Teaching Multilingual Learners in Content Areas	3
TEAC 897E	Student Teaching Internship: English as a Second Language	3
Total Credit Hours		18

Information Technology (Grades K-12) (19 cr; Supplemental)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Must have a valid initial teaching certificate or parallel with one in progress.

TEAC 851L	Learning and Teaching Principles and Practices: Information Technology	3
TEAC 860	Production and Utilization of Instructional Materials	3
TEAC 882A	Modern Programming Tools	3
TEAC 882B	Database and Interactive Web Development	3
TEAC 882D	Artificial Intelligence, and APIs in the Design of Learning Experiences	3

TEAC 882J	Creation of Instructional Activities for Portable Devices	3
TEAC 894L	Professional Practicum Experiences: Information Technology	1
Total Credit Hours		19

Instructional Technology Leadership (Grades P-12) (Supplemental)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Details coming soon.

Reading Specialist (Grades P-12) (30-32 cr; Subject)

Contact: Department of Teaching, Learning and Teacher Education, 402-472-2231.

Persons with this endorsement may teach, provide leadership for professional development in the area of reading, and assess and interpret data to determine and implement instructional options for teaching students.

Must have a valid initial teaching certificate and one year of teaching experience.

TEAC 802	Contemporary Children's Literature: Principles and Practices	3
TEAC 811	Reading Processes and Practices	3
TEAC 836A	Professional Development: Literacy Coaching	3
TEAC 838	Linguistics for the Classroom School Teacher	3
TEAC 839	Literature for Adolescents	3
TEAC 841	Content Area Reading, Grades 4-12	3
TEAC 886 / SPED 886	Assessment, Evaluation, and Instruction of At-Risk Readers	3
TEAC 886B / SPED 886B	Internship in Literacy Assessment and Instruction	3
Select one of the following Options:		6-8
Option 1:		
TEAC 957B / ENGL 957B	Nebraska Writing Project	
Option 2 (select 6-8 hrs):		
TEAC 817	Emerging Reading and Language	
TEAC 854B	Literature in Education: Multiethnic Literature for Children and Adolescents	
TEAC 890	Workshop Seminar	
TEAC 990	Workshop Seminar	
TEAC 921	Seminar in Literacy Studies	
TEAC 950	Contextual Research in English/Language Arts	
TEAC 951	Seminar in Reading Education	
TEAC 952	Language and Learning	
TEAC 953	Seminar on Writing in the Curriculum	
TEAC 989 / EDPS 989	Psychology of Reading and Writing	
SPED 805 / SPED 805A	Code-based Reading Instruction	

TEAC 806 / SPED 806	Reading and Writing Disabilities: Adolescents	
TEAC 806A / SPED 806A	Reading Center Practicum II	
SPED 815 / SPED 815A	Reading and Writing Disabilities: Elementary Students	
Total Credit Hours		30-32

School Counselor (Grades K-6 or 7-12) (47 cr; Subject, Field)

Contact: Department of Educational Psychology, 402-472-2223.

Must have a valid initial teaching certificate and 2 years of teaching experience and must also be admitted into a master's degree program in Educational Psychology.

EDPS 800	Foundations of Educational Research	3
EDPS 853	Psychological Assessment I	3
EDPS 859	Statistical Methods	3
EDPS 866	Counseling Pre-Practicum	3
EDPS 868	Multicultural Counseling	3
EDPS 869	Psychopathological Disorders of Childhood and Adolescence	3
or EDPS 985	Couple and Family Counseling	
EDPS 870	Introduction to Educational and Psychological Measurement	3
EDPS 964	Counseling Theories and Intervention Techniques	3
EDPS 965A	Group Counseling: Social Psychological Aspects	3
EDPS 974	Guidance and Counseling in Schools	3
EDPS 975	Occupations and Vocational Psychology	3
EDPS 984	Ethics and Ethical Decision Making in Counseling and Education	3
EDPS 997A	Practicum in Counseling	4
Choose a level: K-6 (850 + 997B/K-6) or 7-12 (851 + 997B/7-12)		
EDPS 850	Child Psychology (K-6 or 7-12)	3
or EDPS 851	Psychology of Adolescence	
EDPS 997B	Field Placement in Counseling (at K-6 level or 7-12 level)	4
Total Credit Hours		47

To add a K-6 endorsement to a 7-12 endorsement, a student must also take EDPS 850 Child Psychology and EDPS 997B Field Placement in Counseling at the K-6 grade level.

To add a 7-12 endorsement to a K-6 endorsement, a student must also take EDPS 851 Psychology of Adolescence and EDPS 997B Field Placement in Counseling at the 7-12 grade level.

School Psychologist (Grades P-12) (65 cr; Field)

Contact: Department of Educational Psychology, 402-472-2223.

Must have an undergraduate degree in psychology, educational psychology, education or a related field. This is an educational specialist degree program.

Select one of the following:	3
EDPS 850 Child Psychology	
EDPS 851 Psychology of Adolescence	
PSYC 991 Research Methods in Social and Personality Psychology	
EDPS 854 Human Cognition and Instruction	3
EDPS 859 Statistical Methods	3
EDPS 863 Introduction to Applied Behavior Analysis	3
EDPS 867 Ethical and Professional Practice in School Psychology	3
EDPS 869 Psychopathological Disorders of Childhood and Adolescence	3
EDPS 870 Introduction to Educational and Psychological Measurement	3
EDPS 900B Single-Case Experimental Designs in Educational Research	3
EDPS 950 Intellectual Assessment	4
EDPS 951 Academic and Behavioral Assessment	3
EDPS 952 Systems of Consultation in School Psychology	3
EDPS 954 School Mental Health and Behavior Interventions	3
EDPS 981 School Practice in School Psychology	8
EDPS 868 Multicultural Counseling	3
EDPS 958A Internship in School Psychology	3
EDPS 996A Research Other Than Thesis	6
SPED	6
Total Credit Hours	63

Special Education: Deaf or Hard of Hearing (Grades P-12) (45 cr; Subject)

Contact: Department of Special Education and Communication Disorders, 402-472-2141.

Must have a valid initial teaching certificate in Elementary Education a Secondary Content area or Special Education-Mild/Moderate Disabilities. Students without a Special Education certificate are required to take the listed prerequisite courses. Proficiency requirements: Demonstrated proficiency in American Sign Language: successful completion of SLPA 202 Second Year American Sign Language II or minimum level of Intermediate on Sign Communication Proficiency Interview or EIPA or other approved measure before completion of the program.

Prerequisites

SPED 201 Introduction to Special Education (or equivalent)	3
SPED 212 Assessment Techniques for Diverse Learners	3
SPED 414 Instructional Methods for Students with Mathematics Learning Disabilities	3
or SPED 814 Instructional Methods for Students with Mathematics Learning Disabilities	
SPED 454 Behavior Management	3
Select one of the following:	3
SLPA 251 Normal Language Development	

SLPA 452 / SLPA 852 Normal Language Development During School Years	
SPED 876 Language Development for Teachers	
Credit Hours Subtotal:	15
Core Requirements	
SPED 472 Educating Students with Sensory Disabilities	3
or SPED 872 Psychology and Sociology of Deafness	
SPED 873 Deaf or Hard of Hearing: Content Methods	3
SPED 874 Deaf or Hard of Hearing: Language Arts & Literacy (3 cr prior to Fall 2017)	3-4
SPED 875 Itinerant Teaching Methods for Students with Sensory Disabilities	3
SPED 896D Directed Field Experience: Deaf/Hard of Hearing	3
SPED 897D Student Teaching: Deaf/Hard of Hearing	3
SPED 960 Family and School Collaboration in Special Education	3
SLPA 450 / SLPA 850 Audiology for Educators of the Deaf or Hard of Hearing	3
SLPA 884 / SPED 884 Speech and Language Development of the Hearing Impaired	3
Credit Hours Subtotal:	27-28
Total Credit Hours	42-43

Special Education: Early Childhood (Birth - K) (30 cr; Subject)

Contact: Department of Special Education and Communication Disorders, 402-472-2141.

Must have a valid initial teaching certificate in Elementary Education (K-6), Special Education (K-6 or K-12), Early Childhood Education (P-3) or Inclusive Early Childhood (Birth thru grade 3) and admission to the graduate certificate or master's degree program in special education.

Prerequisite Courses

SPED 201 Introduction to Special Education	3
SPED 454 Behavior Management	3
SPED 212 Assessment Techniques for Diverse Learners	3
or CYAF 474 Assessment in Early Childhood	
Credit Hours Subtotal:	9

Required Courses (or equivalent)

CYAF 970 Advanced Early Childhood Education	3
SPED 860 Issues in Early Childhood Special Education	3
SPED 861 Infants with Disabilities and Home Visiting	3
SPED 862 Preschool Children with Disabilities in a Classroom	3
SPED 863 Medically Fragile infants	3
SPED 876 Language Development for Teachers	3
SPED 882 Specialized Instruction for Students with Severe and Multiple Disabilities	3
SPED 896Q Directed Field Experience: Early Childhood Special Education	3

SPED 960	Family and School Collaboration in Special Education	3
TEAC 810	Educational Program for Kindergarten Children	3
Credit Hours Subtotal:		30
Total Credit Hours		39

Special Education: Early Intervention Specialist (Birth - K) (24 cr; Supplemental)

Contact: Department of Special Education and Communication Disorders, 402-472-2141.

Prerequisites: Must have a valid initial teaching certificate in Special Education (K-6 or K-12) and application to the graduate certificate or master's degree program in special education.

Required completion (or equivalent) of 24 credit hours:

SPED 860	Issues in Early Childhood Special Education	3
SPED 861	Infants with Disabilities and Home Visiting	3
SPED 862	Preschool Children with Disabilities in a Classroom	3
SPED 863 or SPED 882	Medically Fragile infants Specialized Instruction for Students with Severe and Multiple Disabilities	3
SPED 896Q	Directed Field Experience: Early Childhood Special Education	3
SPED 960	Family and School Collaboration in Special Education	3
CYAF 874	Assessment in Early Childhood (or equivalent)	3
CYAF 970	Advanced Early Childhood Education	3
Total Credit Hours		24

Special Education: Visual Impairment (Birth - Grade 12) (36 cr; Subject)

Contact: Department of Special Education and Communication Disorders, 402-472-2141.

Persons with this endorsement may teach students with visual impairments from birth through age 21. Visual impairment includes blindness, low vision (legal blindness and low vision) and vision loss associated with other impairments.

Must have a valid teaching certificate.

The following core classes must be completed for the endorsement:

SPED 454	Behavior Management (or equivalent)	3
SPED 846	Foundations of Visual Impairment: Programs and Services for Individuals with Visual Impairments	3
SPED 847	Introduction to Eye Anatomy of Students with Visual Impairments	3
SPED 849	Braille Codes and Material Adaptations for Students with Visual Impairments	3

SPED 851	Intermediate Braille Codes & Instructional Material Adaptations for Students with Visual Impairments	3
SPED 852	Instructional Methods for Teachers of Students with Visual Impairments	3
SPED 853	Orientation and Mobility Skills for Students with Visual Impairments	3
SPED 872	Psychology and Sociology of Deafness	3
SPED 882	Specialized Instruction for Students with Severe and Multiple Disabilities	3
SPED 897V	Student Teaching: Visual Impairments	3
SPED 960	Family and School Collaboration in Special Education	3
SPED 852A	Applied Technology Methods for Students with Visual Impairments	1
SPED 852B	Applied Instructional Methods to Teach Students with Visual Impairments	2
Total Credit Hours		36

Proficiency requirements: Pass braille proficiency exam before completion of the program.

Courses

About these courses

Graduate and professional courses are grouped here by **subject**. Some subjects align one-to-one with majors; some do not. Some courses are **crosslisted** at more than one level (like MATH 415/MATH 815) or in more than one subject (like ENGL 830J/MUSC 830J).

- **Graduate courses** (numbered 800-999) make up the bulk of the A-to-Z subject pages linked below. See also: Graduate Enrollment Toolbox (<http://www.unl.edu/gradstudies/current/enroll>).
- **Professional courses** (numbered 500-799) are in these subjects only: Architecture (ARCH) (p. 66), Landscape Architecture (LARC) (p. 261), Law (LAW) (p. 261), Plant Health (DPLH) (p. 393), Veterinary Medicine (VMED) (p. 484).
- For **undergraduate courses** (0-499) see instead Undergraduate Catalog: Courses (<https://catalog.unl.edu/undergraduate/courses>).

A

- Accounting (ACCT) (p. 22)
- Actuarial Science (ACTS) (p. 26)
- Advertising and Public Relations (ADPR) (p. 28)
- Agribusiness (ABUS) (p. 30)
- Agricultural Economics (AECN) (p. 30)
- Agricultural Engineering (AGEN) (p. 33)
- Agricultural Leadership Education & Communications (ALEC) (p. 36)
- Agricultural Sciences (AGRI) (p. 40)
- Agronomy (AGRO) (p. 40)
- Animal Science (ASCI) (p. 49)
- Anthropology (ANTH) (p. 55)
- Architectural Engineering (AREN) (p. 61)
- Architecture (ARCH) (p. 66)
- Art History and Criticism (AHIS) (p. 72)

- Art Theory and Practice (ARTP) (p. 75)
- Art-Ceramics (CERM) (p. 76)
- Art-Drawing (DRAW) (p. 77)
- Art-Graphic Design & Illustration (GRPH) (p. 77)
- Art-Painting (PANT) (p. 78)
- Art-Photography (PHOT) (p. 78)
- Art-Printmaking (PRNT) (p. 79)
- Art-Sculpture (SCLP) (p. 79)
- Art-Special Topics (ARTS) (p. 80)
- Art-Watercolor (WATC) (p. 80)
- Astronomy (ASTR) (p. 80)

B

- Biological Chemistry (BIOC) (p. 81)
- Biological Sciences (BIOS) (p. 83)
- Biological Systems Engineering (BSEN) (p. 94)
- Biomedical Engineering (BIME) (p. 97)
- Broadcasting (BRDC) (p. 97)

C

- Chemical and Biomolecular Engineering (CHME) (p. 99)
- Chemistry (CHEM) (p. 102)
- Child, Youth and Family Studies (CYAF) (p. 110)
- Civil Engineering (CIVE) (p. 124)
- Classics (CLAS) (p. 131)
- Communication Studies (COMM) (p. 132)
- Community and Regional Planning (CRPL) (p. 134)
- Community Development (CDEV) (p. 137)
- Computer Science and Engineering (CSCE) (p. 142)
- Construction Engineering (CONE) (p. 151)
- Construction Management (CNST) (p. 153)
- Criminology and Criminal Justice (CRIM) (p. 156)

E

- Economics (ECON) (p. 157)
- Education (EDUC) (p. 163)
- Education and Human Sciences (CEHS) (p. 163)
- Educational Administration (EDAD) (p. 163)
- Educational Psychology (EDPS) (p. 173)
- Electrical and Computer Engineering (ECEN) (p. 183)
- Engineering (ENGR) (p. 191)
- Engler Agribusiness Entrepreneurship Program (EAEP) (p. 193)
- English (ENGL) (p. 194)
- Entomology (ENTO) (p. 203)
- Entrepreneurship (ENTR) (p. 207)
- Environmental Engineering (ENVE) (p. 207)
- Ethnic Studies (ETHN) (p. 208)

F

- Finance (FINA) (p. 209)
- Food Science and Technology (FDST) (p. 211)

- Forensic Science (FORS) (p. 216)
- French (FREN) (p. 217)

G

- Geography (GEOG) (p. 219)
- Geology (GEOL) (p. 224)
- Geosciences (GEOS) (p. 229)
- German (GERM) (p. 230)
- Gerontology (GERO) (p. 233)
- Graduate Business Administration (GRBA) (p. 235)
- Graduate College (GRDC) (p. 238)
- Great Plains Study Program (GPSP) (p. 239)
- Greek (GREK) (p. 239)

H

- Hebrew (HEBR) (p. 239)
- History (HIST) (p. 239)
- Horticulture (HORT) (p. 248)
- Hospitality, Restaurant and Tourism Management (HRTM) (p. 254)
- Human Sciences (HUMS) (p. 255)

I

- Industrial and Management Systems Engineering (IMSE) (p. 256)
- Integrative Biomedical Sciences (IBMS) (p. 256)
- Interior Design (IDES) (p. 256)

J

- Journalism & Mass Communications-New Core (JOMC) (p. 257)
- Journalism (JOUR) (p. 258)
- Journalism - Graduate (JGRD) (p. 259)
- Judaic Studies Program (JUDS) (p. 261)

L

- Landscape Architecture (LARC) (p. 261)
- Latin (LATN) (p. 261)
- Law (LAW) (p. 261)
- Life Sciences (LIFE) (p. 316)

M

- Management (MNGT) (p. 316)
- Marketing (MRKT) (p. 320)
- Materials Engineering (MATL) (p. 323)
- Mathematics (MATH) (p. 325)
- Mechanical Engineering (MECH) (p. 334)
- Mechanized Systems Management (MSYM) (p. 342)
- Medieval and Renaissance Studies (MRST) (p. 344)
- Meteorology (METR) (p. 345)
- Modern Languages (MODL) (p. 349)
- Music (MUSC) (p. 350)
- Music - Applied (MUAP) (p. 360)
- Music - Composition (MUCP) (p. 363)
- Music - Ensembles (MUEN) (p. 363)
- Music - Opera (MUOP) (p. 366)

- Music Education (MUED) (p. 366)
- Music Ensemble (credit only) (MUCO) (p. 369)
- Music Ensemble (degree credit) (MUDC) (p. 369)

N

- Natural Resources (NRES) (p. 370)
- Nutrition and Health Sciences (NUTR) (p. 382)

P

- Philosophy (PHIL) (p. 388)
- Physics (PHYS) (p. 391)
- Plant Health Program (DPLH) (p. 393)
- Plant Pathology (PLPT) (p. 394)
- Political Science (POLS) (p. 395)
- Psychology (PSYC) (p. 398)

R

- Raikes School of Computer Science and Management (RAIK) (p. 405)
- Religious Studies Program (RELG) (p. 406)
- Russian (RUSS) (p. 406)

S

- Science Literacy (SCIL) (p. 407)
- Social Work (SOCW) (p. 407)
- Sociology (SOCL) (p. 407)
- Spanish (SPAN) (p. 411)
- Special Education (SPED) (p. 414)
- Speech-Language Pathology and Audiology (SLPA) (p. 424)
- Statistics (STAT) (p. 430)
- Supply Chain Management and Analytics (SCMA) (p. 436)
- Survey Research and Methodology (SRAM) (p. 438)

T

- Teaching, Learning and Teacher Education (TEAC) (p. 440)
- Textiles, Merchandising and Fashion Design (TMFD) (p. 468)
- Theatre Arts (THEA) (p. 475)
- Turfgrass and Landscape Management (TLMT) (p. 480)

V

- Veterinary and Biomedical Sciences (VBMS) (p. 480)
- Veterinary Medicine (VMED) (p. 484)

W

- Water Science (WATS) (p. 487)
- Women's and Gender Studies Program (WMNS) (p. 487)

Accounting (ACCT)

ACCT 801 Fraud Examination and Internal Audit**Crosslisted with:** ACCT 401**Prerequisites:** ACCT Major or Permission; ACCT 314 and ACCT 309 with grade of C or better.**Description:** Principles and methodologies of detecting and deterring fraud using accounting, auditing, and investigative skills. Also introduces the fundamentals of internal auditing in a changing business environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**ACCT 802 Accounting Standards****Prerequisites:** ACCT 810 with a grade of C or better, or permission**Description:** Analysis of changes in authoritative audit and accounting pronouncements. Besides topical coverage, recent discussion memoranda, technical bulletins, interpretations and statements of policy will be emphasized as to their integration into the accounting framework.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACCT 803 Seminar in Financial Accounting****Prerequisites:** Admission to the Masters of Professional Accountancy (MPA) program; or permission of MPA faculty adviser and instructor**Description:** The economic characteristics of accounting information as they relate to the role played by financial accounting reports in allocating capital.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ACCT 916**ACCT 804 Advanced Accounting****Crosslisted with:** ACCT 404**Prerequisites:** ACCT Major or Permission; ACCT 314 with grade of C or better.**Description:** Special accounting problems relating to the preparation of combined and consolidated financial statements for accounting entities with branch offices and with subsidiaries, both domestic and foreign; partnership accounting; accounting for foreign currency transactions and translations; governmental and not-for-profit accounting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACCT 807 Professional Responsibility and Ethics in Accounting****Prerequisites:** Admission to the Master of Professional Accountancy (MPA) program; or permission of MPA faculty adviser and instructor**Description:** Standards of ethical financial reporting and corporate governance in the context of the legal, regulatory, and social environments of corporate business. Acts of law and sanctions imposed for violations of standards of financial reporting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ACCT 808 Business Valuation and Financial Statement Analysis

Prerequisites: ACCT 313 and FINA 361 with grades of C or better.

Description: Provides a broad framework for using financial statement analysis to evaluate a firm's business operations and to predict its future condition using concepts and principles learned in previous accounting and finance courses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 809 Accounting Information Systems (AIS)

Crosslisted with: ACCT 409

Prerequisites: ACCT Major or Permission; ACCT 309 with a grade of C or better.

Description: Identify, document, evaluate, and suggest improvements to accounting information systems (AIS). Focus on impact of new technology on business transactions in an AIS, and how the information system influences and supports business decisions. Current events in the AIS field.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 810 Auditing

Crosslisted with: ACCT 410

Prerequisites: ACCT Major or Permission; ACCT 309 and 314, both with a grade of C or better.

Description: Duties and responsibilities of auditors, methods of conducting various kind of audits; audit working papers; the preparation of the audit report; the auditor's certificate; special problems in the audit of different kinds of enterprises.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ACCT 802; ACCT 832

ACCT 813 Corporate Tax Accounting

Crosslisted with: ACCT 413

Prerequisites: ACCT Major or Permission; ACCT 312 with a grade of C or better.

Description: Federal income taxation for corporations. Tax laws associated with formation, operation, distribution, redemption, and reorganizations are analyzed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 814 Governmental and Not-For-Profit Accounting

Prerequisites: ACCT 314 with a grade of C or better; Admission to the Master of Professional Accountancy (MPA) program; or permission of MPA faculty advisor and instructor

Description: Accounting and reporting for governmental units and organizations established as not-for-profit corporations. Expanded treatment of fund accounting and reporting for agencies operated in and for the general public interest.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 815 Tax Research and Planning

Prerequisites: ACCT 312/812 with a grade of C or better; Admission to the Master of Professional Accountancy program

Description: Development of skills in identifying problems, interpreting facts, conducting research, and communicating results in the field of Federal taxation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 816 Special Topics in Federal Taxation

Prerequisites: ACCT 312/812 with a grade of C or better; Admission to the Master of Professional Accountancy program

Description: Areas of Federal law that are especially relevant in the prevailing economic and political climate.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 817 The Income Tax and Management Decisions

Prerequisites: Courses constituting the equivalent of the undergraduate Common Body of Knowledge requirement for CBA

Description: The impact of Federal income tax law on management decisions, more from the viewpoint of recognizing problems than prescribing solutions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 819 Partnership Tax Accounting

Prerequisites: ACCT 412/812 with a grade of C or better; Admission to the Master of Professional Accountancy program

Description: Federal income taxation for partnerships. Tax laws associated with formation, operation, distribution, disposal, and dissolution.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 831 Seminar in Auditing

Prerequisites: Admission to the Masters of Professional Accountancy (MPA) program; or permission of MPA faculty advisor and instructor

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 832 Applied Auditing

Prerequisites: ACCT 410/810

Description: Introduction to auditing concepts from a theoretical perspective. Applied course to plan, perform, and complete an audit.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 837 Taxation-Individual Income Tax

Description: The structure and content of the federal income tax system, focusing on taxation of individuals. Income, deductions, income splitting, capital gains, and tax accounting. Technical proficiency in solving tax problems and an understanding of the tax policy decisions implicit in the technical rules.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: LAW 745, LAW 745G

ACCT 838 Taxation-Corporate

Prerequisites: LAW 637G.

Description: Advanced federal income tax focusing on income taxation of corporations and shareholders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 840 Fraud Examination

Prerequisites: Admission to the Master of Professional Accountancy (MPA) program; or permission of MPA faculty advisor and instructor

Description: Fraud and how fraud differs from other crimes. Fraud techniques, schemes, and actual fraud cases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 841 Fraud Detection and Prevention

Prerequisites: ACCT 201 and ACCT 202

Notes: Aimed at non-accountants.

Description: The focus is on fraud prevention and detection of risks and weakness that allow fraud to occur. Criminal theory, ethics training, tone-at-the-top, and desirable company policies and codes are covered in more depth.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 848 Business Planning

Prerequisites: LAW 632/G, 638/G

Description: Process of planning business transactions in a way that takes into account many relevant bodies of law as well as the needs of clients. Learn the goals and methods of business planning, the role of ethics in providing legal advice, factors that influence the choice of business entity for a venture, legal rules applying to partnerships and limited liability companies ("LLCs"), relevant laws dealing with corporations and securities regulation, laws that pertain to corporate restructurings, and laws applying to the purchase, sale, or merger of corporate businesses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

ACCT 850 Accounting and Data Analytics

Prerequisites: Admission to the Masters of Professional Accountancy program.

Description: Fundamentals of data exploration, analysis, and communication in an accounting setting. Emphasis on written communication and data visualization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

ACCT 857 Controllershship

Prerequisites: Admission to either the Masters of Professional Accountancy (MPA) or MBA program; or permission of MPA faculty adviser and instructor; ACCT 808 or GRBA 810

Description: Rudiments of conceptual framework for designing and evaluating management accounting and control systems for business firms and situations. Case studies on the management aspects of budgeting, standard setting, variance analysis, cost allocation, operating control, transfer pricing, capital budgeting, performance evaluation, and other pertinent topics relating to managerial uses of accounting data.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

ACCT 858 Seminar in Managerial Accounting

Prerequisites: Admission to either the Masters of Professional Accountancy (MPA) or MBA program; or permission of MPA faculty adviser and instructor

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 863 Taxation-Individual Income II

Description: Most important tax principles affecting business and investments, as well as an introduction to basic tax procedure (both administrative and judicial), civil and criminal fraud, tax research, and certain ethical issues common in tax practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 888 Financial Reporting and Analysis

Prerequisites: Intermediate financial accounting or ACCT 805; permission of the MBA director

Description: How to effectively utilize accounting information presented in financial statements. Analysis of primary financial statements, revenue recognition practices, the financial reporting system, the effects of accounting method choice on reported financial data, and firm valuation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

ACCT 906 Seminar in Comparative Accounting Systems

Prerequisites: Permission (ordinarily at least two senior-level courses in accounting or ACCT *801 and suitable supporting courses)

Description: A research seminar on the conceptual framework underlying selected accounting systems or subsystems. The specific systems studied vary depending upon interest and background of enrolled students, but ordinarily include insurance or other regulatory systems, governmental or other not-for-profit systems, Securities and Exchange Commission regulations, federal income tax rules, and foreign systems. Contrasts with traditional financial and managerial reporting systems and the reasons for the differences that exist.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

ACCT 916 Seminar in Contemporary Accounting Theory: Empirical Tests and Methodologies

Prerequisites: ACCT 803

Description: Empirical validations and implications of accounting information. The convergence of accounting with other disciplines such as: behavioral sciences; portfolio theory; and information theory. Recent empirical studies such as: implications of the efficient capital market hypothesis on external financial reporting, information content of financial reports, and market perceptions of external accounting information.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 920 History and Philosophy of Accounting Thought

Prerequisites: Admission to the Master of Professional Accountancy (MPA) program; or permission of MPA faculty advisor and instructor

Description: The historical development of accounting thought and the individuals, institutions, organizations, and philosophies that shaped its past and present and will influence its future.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 945 Partnership Taxation

Prerequisites: ACCT 812 or LAW 637G.

Description: Survey of important principles of partnership taxation.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ACCT 967 Estate Planning

Prerequisites: Prereq: LAW 637/G

Description: Federal estate and gift taxation, related income tax rules, estate planning concepts, and state inheritance taxation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 968 Estate Planning Problems

Prerequisites: LAW 767G.

Description: Problems of planning and implementing estate plans for clients of substantial wealth with emphasis on skills of drafting the various legal instruments usually required for comprehensive estate planning.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ACCT 969 Tax Policy Seminar

Description: Policies of federal income taxation with emphasis on current legislative proposals and alternatives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 984 Seminar in Selected Topics

Prerequisites: Admission to PhD program and permission.

Description: Topics vary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 990 Accountancy Internship

Prerequisites: Admission to MPA program, permission of MPA adviser, and acceptance into approved internship program

Notes: Maximum of 6 sem hrs can be counted towards the MPA degree.

Description: Students present oral and written reports to faculty seminar once a semester. Independent study of theories, principles, practices, techniques, and strategies utilized in the accounting field. Practical experience in professional accounting situations through a preapproved internship program.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

ACCT 991 Seminar in Capital Market Research in Accounting

Prerequisites: Admission to PhD program, completion of research tools requirement, and permission

Description: Capital market effects of accounting measurements and presentation, foundation of capital market research in accounting, methodology in conducting capital market research, and implication of capital market effects on accounting policy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 992 Seminar in Behavioral Accounting Research

Prerequisites: Admission to PhD program, completion of research tools requirements, and permission

Notes: MNGT 960 recommended.

Description: Behavioral factors in accounting system, design, audit judgment, decision making using accounting data, performance evaluation, accounting policy formation, and other accounting-related tasks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 993 Seminar in Analytical Accounting Models

Prerequisites: Admission to PhD program and permission

Description: Measurement alternatives through modeling of choices and economic analysis of information choices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACCT 995 Seminar in Contemporary Managerial Accounting: Selected Topics

Prerequisites: ACCT 858 or equivalent

Notes: May be repeated for credit if different subject matter.

Description: Special subjects in contemporary managerial accounting.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

ACCT 996 Directed Reading or Research

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 24

Format: IND

ACCT 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Actuarial Science (ACTS)

ACTS 810 Introduction to Credibility, Smoothing of Data, and Simulation

Crosslisted with: ACTS 410

Prerequisites: STAT 463

Description: Full, partial, Buhlmann, and Buhlmann-Straub credibility models. Introduction to empirical Bayes and statistical distributions used to model loss experience. Application of "polynomial splines" to actuarial data. Simulation of "discrete" and "continuous random" variables in context of actuarial models. Simulation to "p-value" of hypothesis test. "Bootstrap method" of estimating the "mean squared error" of an estimator.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ACTS 404

ACTS 825 Survival Models

Crosslisted with: ACTS 425

Prerequisites: STAT 463 with a grade of "C" or better.

Description: Parametric and tabular survival models. Estimation based on observations that might not be complete. Concomitant variables. Use of population data. Applications to groups with impaired lives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ACTS 404

ACTS 830 Actuarial Applications of Applied Statistics

Crosslisted with: ACTS 430

Prerequisites: STAT 463 with a grade of "C" or better.

Notes: Data sets processed and analyzed using statistical software.

Description: Introduction to forecasting in actuarial science. Simple and multiple regression, instrumental variables, time series methods, and applications of methods in forecasting actuarial variables. Interest rates, inflation rates, and claim frequencies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ACTS 840 Interest Theory

Crosslisted with: ACTS 440

Prerequisites: MATH 208 or 208H with a grade of "Pass" or "C" or better, or parallel

Notes: Grade only

Description: Application of financial mathematics to problems involving valuation of financial transactions; equivalent measures of interest; rate of return on a fund; discounting or accumulating a sequence of payments with interest; and yield rates, length of investment, amounts of investment contributions or amounts of investment returns for various types of financial transactions; loans and bonds. Introduction to the mathematics of modern financial analysis. Calculations involving yield curves, spot rates, forward rates, duration, convexity, and immunization.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: ACTS 405; ECON 365; FINA 365; FINA 338; FINA 363; FINA 367; FINA 375; FINA 382; FINA 401; FINA 450; FINA 461; FINA 861; FINA 465, FINA 865

ACTS 841 Introduction to Financial Economics**Crosslisted with:** ACTS 441**Prerequisites:** MATH 208 with grade of "C" or better or concurrent.**Description:** Financial mathematics concepts related to short sales, forwards, options, futures, and swaps, and their use in risk management, hedging and investment strategies, fundamental concepts of put-call parity and no-arbitrage, and interest rate models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACTS 842 Principles of Pension Valuation****Crosslisted with:** ACTS 442**Prerequisites:** ACTS 471/871 with a grade of "C" or better.**Description:** Actuarial cost methods. Determination of normal costs and accrued liability. Effect on valuation results due to changes in experience, assumptions and plan provisions. Valuation of ancillary benefits. Determination of actuarially equivalent benefits at early or postponed retirement and optional forms of payment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACTS 850 Stochastic Processes for Actuaries****Crosslisted with:** ACTS 450**Prerequisites:** STAT 463 with a grade of "C" or better.**Description:** Introduction to stochastic processes and their applications in actuarial science. Discrete-time and continuous-time processes; Markov chains; the Poisson process; compound Poisson processes; non-homogeneous Poisson processes; arithmetic and geometric Brownian motions. Applications of these processes in computation of resident fees for continuing care retirement communities. Pricing of financial instruments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACTS 870 Life Contingencies I****Crosslisted with:** ACTS 470**Prerequisites:** ACTS 440 and STAT 462, each with a grade of "C" or better.**Notes:** First course of a two-course sequence that includes ACTS 471.**Description:** Theory and applications of contingency mathematics in the areas of life and health insurance, annuities, and pensions. Probabilistic models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ACTS 403**ACTS 871 Life Contingencies II****Crosslisted with:** ACTS 471**Prerequisites:** ACTS 470 and STAT 462, each with a grade of "C" or better.**Notes:** Second course of a two-course sequence that includes ACTS 470.**Description:** Life insurance reserve for models based on a single life.

Introduction to multiple life models for pensions and life insurance and to multiple decrement models.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ACTS 403**ACTS 873 Introduction to Risk Theory****Crosslisted with:** ACTS 473**Prerequisites:** STAT 462 with a grade of "C" or better.**Description:** Applications of compound distributions in modeling of insurance loss. Continuous-time compound Poisson surplus processes, computation of ruin probabilities, the distributions of the deficit at the time of ruin, and the maximal aggregate loss. The effect of reinsurance on the probability of ruin.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ACTS 403**ACTS 874 Introduction to Property/Casualty Actuarial Science****Crosslisted with:** ACTS 474**Prerequisites:** STAT 462 with a grade of "C" or better.**Description:** Mathematical, financial, and risk-theoretical foundations of casualty actuarial science. Risk theory, loss reserving, ratemaking, risk classification, credibility theory, reinsurance, financial pricing of insurance, and other special issues and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACTS 875 Actuarial Applications in Practice****Crosslisted with:** ACTS 475**Prerequisites:** ACTS 471/871; FINA 307/307H or FINA 338**Description:** Principles and practices of pricing and/or funding and valuation for life, health, property and liability insurance, and annuities and pension plans. Commercially available actuarial modeling software.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ACTS 930 Fundamentals of Pension Mathematics****Description:** Basic theory of pension mathematics. Funding methods, unit credit, entry age normal, aggregate cost, actuarial assumptions, tax deductible contributions, multi-employer pension plans, deposit administration dividend formulas, variable annuities, and ERISA.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ACTS 950 Seminar in Actuarial Science**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Advertising and Public Relations (ADPR)

ADPR 829 Jacht**Prerequisites:** By permission only. Requires interview process and submission of portfolio.**Description:** Jacht is an innovative educational experience that puts into practice advertising, public relations, marketing, media, research and creative skills and knowledge in a startup ad agency environment. Students must think holistically about integrated marketing communications strategies and how a campaign contributes to the revenue of an agency as well as to the success of the client being served. Students must consider the broader business goals of both the startup agency and of real-world clients. Students are expected to adhere to strict deadlines and to deliver high quality work on time.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 830 Strategic Communications: Advertising Issues and Strategies****Description:** Seminar for graduate students who do not have the equivalent of an undergraduate degree in advertising. Business of advertising and promotion, and the processes and planning involved in strategic promotional communication. Current issues and strategies faced by advertising practitioners, the importance of branding, integrated marketing communications and promotion. Creation of a strategic marketing plan.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 833 Art Direction****Crosslisted with:** ADPR 433**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, ADPR 283, and ADPR 333.**Notes:** Has individual and team projects.**Description:** Visual and graphic design as applied to the corporate environments of advertising and public relations. Print and electronic design principles, strategies and elements using traditional and new digital technologies. Development of creative materials for actual clients, corporate identities, electronic presentations, professional creative portfolios, non-traditional resumes, and World Wide Web (WWW) sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 834 Digital Insight & Analytics****Crosslisted with:** ADPR 434**Prerequisites:** Junior standing; JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** A study of the digital communication landscape. Course explores how various channels of digital communication can be used to analyze audiences, connect with them and ultimately build brands.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 837 International/Multicultural Public Relations****Crosslisted with:** ADPR 437**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** Content and discussions on global issues affecting the public relations profession, the professional, the specialized practices, and the engagement of stakeholders simultaneously at home and at transnational levels.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 838 Global Advertising****Crosslisted with:** ADPR 438**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, ADPR 283.**Description:** Global advertising and communication. Cultural, economic, political and social differences that affect advertising strategy and execution in foreign markets. Advertising a USA product or service in the global market.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 847 Strategic and Creative Concepting****Crosslisted with:** ADPR 447**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283**Description:** The alternative and advanced methods of communicating a message, a need, a perception or attitude. Creative storytelling and problem-solving, critique and analysis, and how to creatively communicate with strategic thinking and design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 850 Public Relations Theory and Strategy****Crosslisted with:** ADPR 450**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283**Description:** Philosophies and theories that underlie the discipline and profession of public relations. The critical and supportive perspectives used to gain insight into the history and direction of public relations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ADPR 851 Public Relations Techniques**Crosslisted with:** ADPR 451**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** Multimedia tools in advertising, public relations, direct marketing, and sales promotion. Promotional writing, publications development, and media relations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 857 Crisis Management in Corporations and Nonprofits****Crosslisted with:** ADPR 457**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** Role of public relations in prevention of crises, response to crises, and recovery from crises. How to preempt, prepare for and respond to corporate, nonprofit and government sector crises from a public relations perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 858 Interactive Media Design****Crosslisted with:** ADPR 458**Prerequisites:** Junior standing, JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** Communication strategies and tactics using interactive media. Exploration of interactive's role in strategic communications, user experience, information architecture, interactive design and development using current web technologies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 859 Writing for Digital Media****Crosslisted with:** ADPR 459**Prerequisites:** Junior standing, JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, ADPR 283.**Description:** Analysis and preparation of radio and television commercials and announcements in terms of content and production techniques. Development of structure and functions of the broadcast advertising media. Regulations, responsibilities, audience analysis, and promotion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 864 Sports Media Relations & Promotions****Crosslisted with:** ADPR 464, SPMC 464, SPMC 864**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221 and ADPR 283.**Description:** Issues in sports media relations and integrated marketing communications. Background of the unpredictable nature of the sports industry and the relationships with its various publics and the media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 866 Social Media Theory and Practice****Crosslisted with:** ADPR 466**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** Key theories related to the study of social media, important social media monitoring and management practices, and advertising/PR opportunities on the most popular social and mobile media platforms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 880 Japanese Visual Culture in Context****Crosslisted with:** ADPR 480, ARTP 480, ARTP 880**Prerequisites:** Permission**Notes:** Letter grade only. A study abroad course that includes four days on campus in Lincoln and two and one-half weeks in Japan.**Description:** Test and hone visual literacy skills in a foreign country.

Observe, analyze, and interpret visual information without the aid of text in the native Japanese language. Sharpen perceptual and analytical skills through daily drawing, writing, and photography in Japan. Increase global awareness through analysis of an issue.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**ADPR 881 Advertising and Public Relations Research****Description:** Research in the planning, development and evaluation of advertising. The research process, use of secondary sources of information and how to analyze data from these sources. The planning and execution of primary research. Survey techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 882 Direct Advertising****Crosslisted with:** ADPR 482**Prerequisites:** Junior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Notes:** Assignments provide practical experience.**Description:** Fundamentals of direct advertising, data base building and management, the economics of the industry, development and testing of effective creative materials, product selection and pricing, telemarketing, business to business direct advertising, lead-generating programs, the use of electronic and print media in the direct advertising mix and fund-raising for worthy causes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ADPR 883 Portfolio Development****Crosslisted with:** ADPR 483**Prerequisites:** Junior standing; JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.**Description:** How to improve individual portfolios of creative work and execute a variety of creative pieces that demonstrate improvement in their collections.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

ADPR 884 Brands & Branding

Description: The managerial philosophy, techniques, and processes in advertising. Organizational structures, integrated marketing communications, strategic planning, marketing planning, advertising planning, advertising research, budgeting, and decision paradigms.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ADPR 888 Media Sales and Promotion

Crosslisted with: ADPR 488

Prerequisites: Junior standing, JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, ADPR 283.

Description: Techniques for print and electronic media sales and promotion. Rate structures, legal requirements, and social and economic effects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ADPR 889 Advertising and Public Relations Campaigns

Crosslisted with: ADPR 489

Prerequisites: Senior standing and JOMC 101, JOMC 130-134, ADPR 151, ADPR 221, and ADPR 283.

Notes: Requires working in teams.

Description: Conduct research and evaluate the findings to develop and present an integrated marketing communications strategy and creative materials for a multimedia advertising and public relations campaign needed by a client. Application of knowledge, experience, and skills learned in previous courses to a new situation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ADPR 891 Special Topics in Advertising

Crosslisted with: ADPR 491

Notes: May be repeated up to three times so long as the topics are different. 12 hours max special topics hours at all levels (100, 200, 300, 400) per degree.

Description: Topics vary each term.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 12

Format: LEC

ADPR 896 Independent Study in Advertising and Public Relations

Crosslisted with: ADPR 496

Prerequisites: Permission

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

ADPR 930 Integrated Media Communications Capstone Seminar

Prerequisites: Completion of at least two thirds of required coursework (24 hours) and Memorandum of Courses filed

Description: Capstone course in the Integrated Media Communications (IMC) specialization. Reflect on different theories and concepts and apply those theories and concepts to real-life examples and professional goals in a final paper and presentation to faculty and peers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Agribusiness (ABUS)

ABUS 855 Marketing and Globalization

Crosslisted with: MRKT 855

Prerequisites: GRBA 813 or equivalent

Description: Globalization and resulting changes in the business environment. Access to new consumers, new supplies. The effect on consumer choices. Readings from scholarly and popular press, videos, and a "real world" application. Marketing strategies developed for Nebraska firms and organizations such as value-added food marketers.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Agricultural Economics (AECN)

AECN 801 Advanced Farm Management and Linear Programming

Crosslisted with: AECN 401

Prerequisites: AECN 201.

Description: The role of budgeting and linear programming in analyzing farm organization problems, theory of linear programming, linear program design, and analysis of linear programmed solutions to farm organization problems. Includes goal programming, multiple objective programming, risk programming, and financial modeling.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AECN 804 Agricultural Law

Description: Legal problems and issues of unique importance to lawyers serving the agricultural sector. Representative topics include economic and environmental regulation of agriculture; organizing the farm business; financing agricultural production; marketing agricultural products; and managing agricultural risk.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AECN 812 Organization and Performance of Agricultural Markets

Description: Economic theory of industrial organization and performance applied to agricultural input, raw product, and processed product markets. Buyer market power at first-handler level, spatial markets, vertical integration and contract coordination, and organizational forms unique to agriculture.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AECN 901B

AECN 814 Agricultural Price Analysis

Description: Economic relationships among the forces that determine the demand, supply and prices for agricultural commodities, products, and factors of production within and across markets. Theoretical foundations reviewed covering individual consumer demand, commodity and factor markets and price determination. Empirical methods applied in analyzing demand, supply and prices, and the factors affecting them. Multiple projects, including interpreting the results, to reinforce understanding of economic behavior.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AECN 815 Analytical Methods in Economics and Business

Crosslisted with: ECON 815

Prerequisites: MATH 104 or 106

Description: Equilibrium Analysis: Applications in business, finance, and economics. Market equilibria, accumulations, and economics.

Optimization: profit, cost, and utility functions. Constrained optimization problems with utility functions. Constrained optimization problems in production and consumer allocations; Kuhn and Tucker conditions; static and dynamic input-output Models.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: ECON 917

AECN 821 Orientation to Research

Description: Introduction to approaches to agricultural economics research. Critical evaluation of agricultural economics literature. Identify an area of research interest and present a review of current literature in the area.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

AECN 827A Static Optimization with Mathematical Programming

Description: Optimization methods in economics, organized into modules, each of which introduces the fundamental methods used in the analysis of a particular class of economic problems. Each module is taught within the framework of consumer, firm, or social welfare optimization problems.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

AECN 832 Economics of Agricultural Production

Prerequisites: AECN 201, ECON 373, MATH 104

Description: Static economic analysis of multi-variant agriculture response functions. Resource and enterprise choice, cost functions, resource evaluation, and size and scale economies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AECN 840 Applied Welfare Economics and Public Policy

Prerequisites: AECN/ECON *873

Description: Principles of welfare economics applied to policy issues in agriculture and natural resources. Review of measures of household welfare, willingness to pay, and notions of Pareto optimality, aggregate welfare and market failure. Practical methods of comparative statics analysis of the effect of public policies on consumer and firm behavior, and on market equilibrium. Theory of externalities and welfare implications of market versus non-market allocation of public goods examined. Applications include evaluation of such policies as taxes, price supports, quotas, pollution controls, environmental damage liability, and intellectual property rights.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AECN 852 Agricultural Finance

Crosslisted with: AECN 452

Prerequisites: AECN 201 or 4 hrs accounting.

Description: Principles and concepts of financial management of farm and agribusiness firms developed. Various strategies for acquiring and using capital resources by the individual firm explored. Institutions providing the sources of agricultural credit are individually studied.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AECN 416

AECN 856 Environmental Law

Crosslisted with: AECN 456, NREE 456

Prerequisites: Junior standing. AECN 357/NREE 357.

Notes: Available through Online and Distance Education.

Description: Administrative law, risk assessment, environmental impact review, Clean Air Act, Clean Water Act, non-point pollution control, wetlands regulations pesticide and toxic substance regulation, solid and hazardous waste regulation, drinking water protection, land use regulation, energy policy, and international environmental law.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: PSI

AECN 857 Water Law**Crosslisted with:** AECN 457, NREE 457, WATS 457**Prerequisites:** AECN/NREE 357.**Description:** Environmental impact review; public trust doctrine; endangered species; land use controls; wetlands regulation; surface and ground water rights; Indian and federal water rights; impact of water quality regulations on water allocation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** PSI**AECN 865 Resource and Environmental Economics II****Crosslisted with:** AECN 465, NREE 465, WATS 465**Prerequisites:** MATH 104 and one course in statistics.**Description:** Application of resource economics concepts and empirical tools to resource management problems. Public policy issues involving environmental quality, land and water management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 868 Advanced Resource and Environmental Economics****Prerequisites:** AECN/ECON 873, AECN 865, ECON 817**Description:** Application of conceptual and empirical tools for analyzing resource problems. Both public and private dimensions of resource management are considered with emphasis on public policy. Economics of environmental quality, management of exhaustible and renewable resources, valuation of non-market goods and key elements of environmental policy analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AECN 901J**AECN 873 Microeconomic Models and Applications****Crosslisted with:** ECON 873**Prerequisites:** ECON 211, 212, and 215**Description:** This course is intended for MA Option II students and others who do not plan to proceed to PhD studies. Analysis of microeconomic decision-making by individuals and firms with emphasis on consumer demand, production, cost and profit, market structure and the economics of games, uncertainty, and information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 883 Ecological Economics****Crosslisted with:** NRES 883, CDEV 883**Prerequisites:** AECN 141 or ECON 212 or equivalent**Description:** A synthesis across the notion of "utility" as represented in traditional environmental and natural resource economics, "ecology" in ecological economics, and "community" in behavioral economics. Ideas from thermodynamics with a focus on renewable resources. Development, organization, and enhancement of eco-business, eco-industry, eco-government and eco-communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 893 Law and Economics****Description:** Introduction to economic tools and their application to the law. Overview of the principles of microeconomics and their application to various areas of private law (e.g., torts, contracts, property) and public law (e.g., environmental, constitutional, and criminal law & procedure).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 896 Special Topics in Agricultural Economics****Prerequisites:** 12 hrs agricultural economics or closely related areas and permission**Description:** Focused agricultural economics topics through research, narrowly targeted literature review, or extension of course work.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**AECN 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**AECN 901 Directed Study of Advanced Topics in Agricultural Economics****Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**AECN 901A Production Economics****Prerequisites:** ECON 912A and 911A, or permission**Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 901B Agricultural Industrial Organization****Prerequisites:** AECN 812**Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AECN 901D International Agricultural Trade**Prerequisites:** ECON 821 or permission**Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 901E Agricultural Development****Prerequisites:** ECON 912A and 911A, or permission**Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 901J Natural Resource Economics****Prerequisites:** AECN 868**Description:** Significant literature in selected fields of agricultural and resource economics to provide a broad background for conducting research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 902 Research in Agricultural Economics****Prerequisites:** Appropriate section of AECN 901**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**AECN 902A Production Economics****Prerequisites:** AECN 901A.**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 902B Agricultural Industrial Organization****Prerequisites:** AECN 901B.**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 902D International Agricultural Trade****Prerequisites:** AECN 901C.**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 902E Agricultural Development****Prerequisites:** AECN 901D.**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 902J Natural Resource Economics****Prerequisites:** AECN 901E.**Description:** Investigation of a research issue in a field of agricultural economics. Identification of an issue, discovery and interpretation of relevant research, rigorous development of an additional contribution to the resolution of the issue.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 921 Seminar in International Trade and Finance****Crosslisted with:** ECON 921**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AECN 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Agricultural Engineering (AGEN)

AGEN 824 Machine Design in Agricultural Engineering**Crosslisted with:** AGEN 424**Prerequisites:** Senior standing; AGEN 324; and MECH 130**Description:** Design of machine elements. Definition, analysis, and solution of a design problem in agricultural engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

AGEN 841 Animal Waste Management**Crosslisted with:** AGEN 441, BSEN 441, BSEN 841**Prerequisites:** Senior standing.**Description:** Characterization of wastes from animal production. Specification and design of collection, transport, storage, treatment, and land application systems. Air and water pollution, regulatory and management aspects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGEN 846 Unit Operations of Biological Processing****Crosslisted with:** BSEN 446, BSEN 846, AGEN 446**Prerequisites:** AGEN/BSEN 225; and AGEN/BSEN 344**Description:** Application of heat, mass, and moment transport in analysis and design of unit operations for biological and agricultural materials. Evaporation, drying, distillation, extraction, leaching, thermal processing, membrane separation, centrifugation, and filtration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** BSEN 935**AGEN 853 Irrigation and Drainage Systems Engineering****Crosslisted with:** AGEN 453, BSEN 453, BSEN 853**Prerequisites:** CIVE 310 or MECH 310; AGEN 344 or BSEN 344.**Description:** Analytical and design consideration of evapotranspiration, soil moisture, and water movement as related to irrigation and drainage systems; analysis and design of components of irrigation and drainage systems including water supplies, pumping plants, sprinkler systems, and center pivots.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 854, MSYM 854**AGEN 854 Irrigation Laboratory and Field Course****Crosslisted with:** MSYM 854**Prerequisites:** AGEN 453/853, or MSYM 452/852**Notes:** Offered during the summer pre-session in even calendar years.**Description:** A laboratory and field course which emphasizes irrigation water supply and distribution systems. Laboratory topics include performance of surface, sprinkler, and drip irrigation systems; pipeline hydraulics; flow in streams, canals, and irrigation pipelines; irrigation pumping systems; irrigation well hydraulics; and soil water properties. The field trip includes visits to irrigation water supply and hydroelectric power projects; water resources agencies; irrigation field research sites; and manufacturers and installers of agricultural irrigation systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Offered:** SUMMER**AGEN 860 Instrumentation and Controls****Crosslisted with:** AGEN 460, BSEN 460, BSEN 860**Prerequisites:** ELEC 211 or ELEC 215.**Description:** Analysis and design of instrumentation and controls for agricultural and biological production, management and processing. Theory of basic sensors and transducers, analog and digital electrical control circuits, and the interfacing of computers with instruments and controls. Emphasis on signal analysis and interpretation for improving system performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGEN 889 Seminar I****Crosslisted with:** BSEN 889**Description:** Introduction into departmental and campus resources, professionalism, preparation and delivery of presentations, technical writing, and additional topics as arranged by enrolled students.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGEN 892 Special Topics in Agricultural Engineering****Crosslisted with:** AGEN 492**Prerequisites:** Permission**Description:** Subject matter in emerging areas of Agricultural Engineering not covered in other courses within the curriculum. Topics, activities, and delivery methods vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**AGEN 896 Special Problems****Crosslisted with:** BSEN 896**Prerequisites:** Permission**Description:** Investigation and written report on engineering problems not covered in sufficient depth through existing courses. Topic varies by semester.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND

AGEN 897 Masters Project**Crosslisted with:** BSEN 897, MSYM 897**Prerequisites:** Admission to M.S. in Agricultural and Biological Systems Engineering or M.S. in Mechanized Systems Management, and permission of major advisor**Notes:** Intended for students who are pursuing an Option II or III master's degree in Agricultural and Biological Systems Engineering, or Mechanized Systems Management.**Description:** Conception, design, development, and completion of a project that requires data collection, synthesis, analysis of results, and the development of a final written report that will be defended in the final oral examination.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**AGEN 898 Internship****Crosslisted with:** BSEN 898**Prerequisites:** Permission**Notes:** Students required to write an internship report of their creative accomplishments after completion of the internship. Students may spend up to nine months at the cooperating partner's workplace.**Description:** Solution of engineering or management problems through a non-academic experience within the private sector or a government agency. The experience entails all or some of the following: research, design, analysis, and testing on an engineering problem. A plan, which documents how the individual will demonstrate creativity during the internship must be approved prior to the internship.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**AGEN 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**AGEN 923 Advanced Design in Agricultural Engineering****Prerequisites:** Agricultural engineering or permission**Description:** The use of theories of failure, fatigue, stress concentrations, shock and impact analysis in the design of machine members.

Laboratory work includes an in-depth study of the testing and analysis of machine components.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGEN 941 Agricultural Waste Management****Crosslisted with:** BSEN 941**Prerequisites:** Permission**Description:** Aerobic, anaerobic, and physical-chemical treatment, energy recovery and protein synthesis processes for high-strength organic materials; agricultural applications including composting, ammonia stripping, nitrification, denitrification, and land disposal of organic and chemically treated materials.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGEN 953 Advanced Irrigation and Drainage Systems Engineering****Prerequisites:** AGEN 853, MATH 821 or permission**Description:** Advanced analytical considerations of environmental aspects of soil-plant systems; movement of water in soils; water movement through plants; and irrigation and drainage systems for controlling water in the soil-plant environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGEN 954 Hydrologic Modeling of Small Watersheds****Prerequisites:** AGEN 854 and CIVE 822**Description:** Mathematical modeling of the runoff process for small rural and urban watersheds. Appraisal of techniques for estimating runoff volume and peak discharges for ungaged watersheds; hydrograph synthesis; composite hydrographs; and frequency relationships of rainfall and runoff.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**AGEN 955 Solute Movement in Soils****Crosslisted with:** AGRO 955, CIVE 955, GEOL 985**Prerequisites:** MATH 208; AGRO 861 or GEOL 888 or MSYM 852 or CIVE 858**Description:** Examination of the theory and experimental evidence available to characterize the movement of chemicals in soil. Both saturated and unsaturated flow conditions examined. Initial presentation of basic theoretical concepts. Remainder of class a discussion of the literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AGEN 957 Modeling Vadose Zone Hydrology**Crosslisted with:** BSEN 957, CIVE 957, GEOL 957**Prerequisites:** MATH 221/821 or equivalent. AGEN/BSEN 350 or NRES 453/853 or equivalent.**Notes:** Typically offered spring semester in even years.**Description:** Principles and modeling of fluid flow and solute transport in the vadose zone. Topics include hydraulic properties of variably saturated media, application of Darcy's Law in variably saturated media, hydrologic and transport processes in the vadose zone, and solution of steady and unsteady flow problems using numerical techniques including finite element methods. Contemporary vadose zone models will be applied to engineering flow and transport problems. Review and synthesis of classic and contemporary research literature on vadose zone hydrology will be embedded in the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**AGEN 989 Seminar II****Crosslisted with:** BSEN 989**Description:** Developing a graduate program, orientation to research, grant and research proposal preparation, experimental design and analysis, manuscript preparation and review, preparations and delivery of technical presentations, and research management.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGEN 998 Advanced Topics****Crosslisted with:** BSEN 998**Prerequisites:** Permission**Description:** Individual study in advanced engineering topics that are not covered in regular course work or thesis. Topic varies by term.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**AGEN 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Agricultural Leadership Education & Communications (ALEC)

ALEC 800 Overview to Program Planning**Crosslisted with:** ALEC 400**Prerequisites:** ALEC 305 or ALEC/TEAC 805/NUTR 806.**Notes:** Designed for individuals interested in developing and/or improving program planning skills.**Description:** Theoretical and applied considerations for identifying content, design, implementation, and evaluation of educational programs that vary in length from several hours to several months.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 801 Theoretical Foundations of Leadership****Description:** Major research thrusts in leadership field. Historical and contemporary research studies, surveying the literature, developing theory, and conceptualizing original research questions and problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ALEC 433, ALEC 833; ALEC 802; ALEC 901**ALEC 802 Developing Leadership Capacity in Organizations and Communities****Prerequisites:** ALEC 801 or equivalent**Description:** Leadership capacity in individuals and organizations. Impact of leadership on organizational outcomes and means for diagnosing leadership developmental needs. Assessing, creating and implementing a comprehensive leadership development program for an organization or community.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 804 Problems of Beginning Agriscience Teachers****Description:** Problems in instructional planning and methodology and in organizing secondary and continuing education, FFA, and agriculture experience programs.**Credit Hours:** 2-5**Min credits per semester:** 2**Max credits per semester:** 5**Max credits per degree:** 5**Format:** LEC**ALEC 805 Advanced Teaching Strategies****Crosslisted with:** NUTR 806, TEAC 805**Description:** Contemporary and innovative teaching strategies, emphasizing learner-centered instruction, suitable to teaching in college and postsecondary institutions, outreach programs public schools, and other settings. Students participate in active learning as they apply learning theory in practice, prepare and demonstrate teaching methods, and plan for instruction in discipline areas of their choice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ALEC 400, ALEC 800; TEAC 905, ALEC 905

ALEC 807 Supervisory Leadership**Crosslisted with:** ALEC 407, CYAF 807**Prerequisites:** ALEC 302**Description:** Knowledge and theoretical basis for practicing supervisors in a changing workplace where supervisors have increasing responsibilities due to the flattening or organizational structures, solving supervisory challenges in organizing and planning, problem solving and decision making, performance appraisal and leading a diverse workforce.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 809 Diffusion of Innovations: Through an Extension Context****Description:** A change agent influences innovative decisions in a direction deemed desirable by a business, agency, or organization. Overview of key characteristics of change agents as well as processes by which they influence the introduction, adoption, and diffusion of technological changes in society. Prepares those who are responsible for bringing about change in their community and within the Extension system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ALEC 810 Environmental Leadership****Crosslisted with:** ALEC 410, NRES 413, NRES 813**Prerequisites:** Junior standing.**Notes:** Offered on the World Wide Web (WWW) fall semester of odd-numbered years and in the classroom fall semester of even numbered-years.**Description:** Major leaders in conservation and ecology that emphasizes agricultural and cultural issues and relationships with the environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 812 Multimedia Applications for Education and Training****Crosslisted with:** ALEC 412, NUTR 812**Description:** Practical applications in developing and evaluating multimedia resources for students. Surveys new applications, creates and develops various instructional materials, and reviews current practice against relevant theory. Use current software packages to develop materials for various audiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 814 Classic Figures in Leadership****Crosslisted with:** ALEC 414**Description:** Leadership theory in an applied context. Leadership analyzed through a variety of genres: autobiography, drama, fiction, tracts and treaties, speeches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 816 Management Strategies in Distance Education Environments****Description:** Management strategies for a variety of distance education situations. Planning, organization, motivation, and control provide a framework for analyzing distance education in formal and non-formal, large and small, private and public, and established and emerging organizations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 818 Community Engagement****Crosslisted with:** CDEV 818**Description:** A foundational knowledge of community engagement. This will include understanding a community's readiness to change; strategies to engage community's members and strategies to determine goals and indicators to achieve change. Participants will review and critique various community engagement and readiness processes, gaining an understanding of approaches advantages and limitations. Through case studies, experiential learning and discussions, participants will develop a skillset for community engagement processes that lead to long term change.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ALEC 820 Improvement of Instructional Programs for Post-High-School Occupational Education****Crosslisted with:** ALEC 420**Description:** Designing new instructional programs, expanding the impact of student behavioral objectives, and evaluating the total instructional program.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 824 Foundation of Career and Technical Education****Crosslisted with:** ALEC 424**Description:** Scope and structure of career and technical education within the educational system. Teacher's role and responsibilities in dealing with legislative mandates in planning, management, and evaluation of a local program.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 826 Program Evaluation****Prerequisites:** ALEC 833 recommended**Description:** Builds upon program development in extension programming and provides a basic overview of program evaluation principles and methods. Applies program evaluation principles in extension education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ALEC 828 Leadership in Public Organizations**Crosslisted with:** ALEC 428, NRES 428, NRES 828**Prerequisites:** Junior standing.**Description:** Leadership in theories, research, and practices in public organizations and natural resource agencies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 830 Introduction to the Development of Distance Education Courses****Crosslisted with:** ENTO 830**Description:** Introduction to practical aspects of developing and facilitating distance education courses. Create and facilitate interaction, assessments, course delivery, assignments, course etiquette and ADA compliance. Develop a distance course module grounded in distance education theory and instructional design principles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 833 Dynamics of Effective Leadership in Groups & Teams****Crosslisted with:** ALEC 433**Prerequisites:** ALEC 801 or parallel**Description:** This course will cover the foundational knowledge of team and group dynamics theory and its relationship to the practice of leadership in organizations and communities. Development of leadership, followership, and teamwork skills in small groups and teams. Focus on team and group decision making, problem solving, and creativity, peer assessment, and evaluation using real-world situations and contexts. Critically apply team and group dynamic theories and research to leadership in organizations and communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 845 Research in Leadership Education****Crosslisted with:** CYAF 845**Description:** Steps in preparing a research proposal, including statement of the research question, review of relevant literature, and determination of an appropriate research design and methodology. Research methodology, including both quantitative and qualitative procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 866 Leadership and Diversity in Organizations and Communities****Crosslisted with:** ALEC 466**Prerequisites:** Junior standing.**Description:** Leadership theories and their applications to human diversity in organizations and communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 877 Leadership and Motivation****Crosslisted with:** ALEC 477**Description:** Classic and contemporary motivation theories applied to leadership in organizations and communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 888 Leadership, Power and Influence****Crosslisted with:** ALEC 488**Description:** Organizational influence processes, power, and politics in organizations and communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ALEC 890 Workshop Seminar****Prerequisites:** Permission**Description:** Work, singly or in groups, on practical educational problems, done under the supervision of staff with assistance of selected educational consultants.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**ALEC 893 Technical Agricultural Workshop****Prerequisites:** Permission**Description:** Group study of technology in agricultural occupations. Workshops, special meetings, and assignments.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**ALEC 896 Independent Study in Leadership Education****Crosslisted with:** ALEC 496**Prerequisites:** Permission.**Description:** Projects to research, literature review, or extension of course work.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** IND**ALEC 897 Special Topics****Description:** Readings, in-depth discussions and analysis of current theory, issues and problems, research and practice in leadership education and/or communication. Offered to address emerging topics not covered in other courses.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ALEC 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

ALEC 901 Leading Change in Rural America and Beyond

Prerequisites: ALEC 801, 18 hours graduate credit, or permission

Description: Skills in leading change in the 21st Century in rural communities and organizations. Strategies for planning, organizing, and institutionalizing change. Develop a change plan for a community or organization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 903 Teacher Education in Agriscience

Description: Preparation of agriscience teachers to supervise and mentor student teachers, evaluate/coach performance, and instructional delivery.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 904 Seminar in Leadership Studies

Description: Ideas, theories, and practices on recent and emerging leadership research themes.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ALEC 905 Practicum in Postsecondary Teaching

Crosslisted with: TEAC 905

Prerequisites: ALEC 805 or permission

Description: Work with a faculty mentor in a discipline of choice and an instructional supervisor to prepare instruction and teach students in a postsecondary setting. Practicum students are assisted in arranging for the practicum and are provided consultation and feedback during the practicum. Lesson planning and reflective papers are part of the practicum experience.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 1

Format: FLD

ALEC 906 Theoretical Foundations of Distance Education

Prerequisites: ALEC 806 recommended

Description: Major theoretical concepts and research finding of distance education, as broadly conceived. Emphasis on analyzing and deconstruction of major ideas influencing distance education in formal and non-formal settings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 908 Organization of the Agricultural Mechanics Program

Description: Philosophy, objectives, procedures, and techniques used in organizing the program of agricultural mechanics instruction for secondary and post-high school students and adults. Determining units of instruction, evaluating student effort, procedures in shop instruction, selection of equipment, and integration into the vocational agriculture program.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 910 Leadership in Cross-cultural Systems

Prerequisites: ALEC 801 recommended

Description: Issues of leading people in the global marketplace. Focus on understanding the impact of cultural differences, comparing and contrasting domestic and multinational leadership challenges, and review of current multinational leadership.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 913 Program Development in Occupational Education

Description: Philosophy and objectives of occupational education. Techniques of program development, choosing instructional areas, determining sequences, planning time distributions, integrated course of study and meeting individual needs, youth activities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ALEC 914 Leadership and Personality

Description: Personality type and its implications for personal, team, and organizational leadership effectiveness.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

ALEC 995 Doctoral Seminar in Leadership Studies

Prerequisites: Permission

Description: Outcome-based scholarly activity approved in consultation with doctoral advisor. While working on either an individualized or small group basis, develop, execute, and report one or more projects addressing the interaction between research and practice in the field of leadership.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: IND

ALEC 996 Research Other Than Thesis

Prerequisites: Permission.

Description: Research in selected problems in leadership education.

Credit Hours: 2-6

Min credits per semester: 2

Max credits per semester: 6

Max credits per degree: 6

Format: IND

ALEC 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Agricultural Sciences (AGRI)

AGRI 810 Research Strategies in Agriculture

Description: Practical topics related to the planning, organization, administration, financing and reporting of research in agriculture.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

AGRI 828 Scientific Illustration

Crosslisted with: ENTO 828, AGRO 828, HORT 828

Prerequisites: 12 hrs agricultural and/or biological sciences.

Description: Prepare scientifically accurate, high quality illustrations and graphics for the teaching, presentation, and publication of scientific information. Drawing techniques, drafting, copyright, and publication and presentation of scientific art work.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRI 862 Invasive Pests and International Trade

Crosslisted with: AGRI 462

Notes: Offered fully online.

Description: Examination of the global issue of the impact of invasive pests on international trade, food production, and ability to feed increasing populations in the future. Focus on how local changes have biological, economic and social consequences at the global level and impact sustainability. Covers pest introductions and pathways, impact on global agriculture and trade, principles and practices in agricultural pest risk analysis and international cooperation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRI 888 Teaching Undergraduate Science

Crosslisted with: AGRI 488, SCIL 488, SCIL 888

Description: The dynamics of undergraduate student learning. Begin to develop the reflective practice of progressive instructional improvement. Interpreting improved educational outcomes in terms of the ability of the instructor to manipulate undergraduate student interactions with instructional materials in an active learning environment.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Offered: FALL

AGRI 896 Independent Study in Agricultural Sciences

Crosslisted with: AGRI 496

Prerequisites: Advanced approval of the plan of work and permission.

Description: Individual or group projects in activities such as research, literature review, extension of course work, or preparation of teaching materials.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 12

Format: IND

AGRI 897 Master of Applied Science Project

Crosslisted with: AGRO 897, HORT 897, NRES 897

Prerequisites: Admission to Master of Applied Science degree program

Notes: Project activity for the Master of Applied Science degree.

Description: Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

AGRI 899 Master of Applied Science Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Description: Thesis in support of candidate for a Master of Applied Science degree.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: LEC

Agronomy (AGRO)

AGRO 801 Biology of Plant Pathogens

Crosslisted with: PLPT 801, HORT 801

Prerequisites: PLPT 369 or equivalent; an introduction to biochemistry course

Description: Molecular and cellular approach to the study of plant pathological principles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

AGRO 802 Ecology and Management of Plant Pathogens

Crosslisted with: PLPT 802, HORT 802

Prerequisites: PLPT 369 or equivalent; an introduction to biochemistry course

Description: Principles of plant disease epidemiology and disease control through cultural, biological, chemical and host plant resistance strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

AGRO 803 Scientific Writing and Communication

Crosslisted with: AGRO 403, HORT 403, HORT 803

Prerequisites: Senior standing or higher, an ACE 1 written communication course, an ACE 2 oral communication course, and permission of instructor.

Description: Reading and critiquing, writing, and presenting scientific information. Use research data to compose a manuscript in standard scientific format, and prepare and present a poster to a general audience. Ethical issues in research and writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 806 Plant Ecophysiology: Theory and Practice

Crosslisted with: HORT 406, HORT 806, NRES 406, NRES 806, AGRO 406

Prerequisites: Junior standing; 4 hrs ecology; and 4 hrs botany or plant physiology.

Description: Principles of plant physiology which underlie the relationship between plants and their physical, chemical and biotic environments.

An introduction to the ecological niche, limiting factors and adaptation.

An overview of the seed germination and ecology, plant and soil water relations, nutrients, plant energy budgets, photosynthesis, carbon balance and plant-animal interactions. An introduction to various field equipment used in ecophysiological studies.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

AGRO 807 Plant-Water Relations

Crosslisted with: NRES 807

Prerequisites: AGRO 325 or equivalent; MATH 106 recommended

Description: Quantitative study of water relations in the soil-plant-atmosphere system. Basic physical processes, which describe the movement of water in the soil and the atmosphere, and the physiological processes, which describe water movement inside of the plant. Stomata physiology and the effects of internal water deficits on photosynthesis, respiration, nitrogen metabolism, cell division and cell enlargement. Results from integrative models used to study the relative importance of environmental versus physiological factors for several plant-environment systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

AGRO 808 Microclimate: The Biological Environment

Crosslisted with: AGRO 408, GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, GEOG 808, HORT 808, METR 808, NRES 808

Prerequisites: Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering.

Description: Physical factors that create the biological environment.

Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGRO 907, HORT 907, METR 907, NRES 907; BSEN 954, NRES 954

Groups: Physical Geography

AGRO 809A Case studies in plant breeding: Breeding for Disease Resistance

Crosslisted with: AGRO 409A, HORT 409A, HORT 809A

Description: The application of fundamental genetics principles in inheritance, gene mapping and DNA analysis to decision making by plant breeders with the goal of improving disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of plant breeders who will use these discoveries in their work.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

AGRO 809B Case Studies in plant breeding: Transgenic strategies for disease resistance

Crosslisted with: AGRO 409B, HORT 409B, HORT 809B

Description: The application of basic science and technology by plant genetic engineering experts with the goal of teaming with plant breeders to improve disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of genetic engineers and plant breeders who will use these discoveries in their work.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

AGRO 810 Plant Molecular Biology

Crosslisted with: BIOC 810, HORT 810

Prerequisites: AGRO 215 or BIOS 206; BIOC 831

Description: Molecular genetic basis of biological function in higher plants. Genome organization, gene structure and function, regulation of gene expression, recombinant DNA, and genetic engineering principles. Material taken primarily from current literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

AGRO 811 Crop Genetic Engineering**Crosslisted with:** AGRO 411**Description:** Basic steps required to produce genetically engineered crops. Genetic engineering procedures used to develop current crops and innovations that will lead to future products. Genetic engineering process and predicting how changes in different steps of the process influence the final crop. Application of genetic engineering technology to plan the development of new genetically engineered crops.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**AGRO 812 Crop and Weed Genetics****Crosslisted with:** AGRO 412**Notes:** A previous class in Genetics is highly recommended.**Description:** Application of classical and molecular genetic principles to the explanation of variation observed in plant families and populations. Interpretation of information gathered from whole plant trait observation and from molecular analysis. Relationships between crops and weeds. Examples from genetic studies on both crop and weed species are the basis of course.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**AGRO 813 Turfgrass and Landscape Weed Management****Crosslisted with:** HORT 813, TLMT 813**Description:** Fundamental terminology associated with turfgrass and landscape weed management. Weed identification and the cultural practices and herbicide strategies to limit weed invasion and persistence.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 814 Turfgrass Disease Management****Crosslisted with:** AGRO 414, HORT 414, HORT 814, PLPT 414, PLPT 814, TLMT 414, TLMT 814**Prerequisites:** BIOS/PLPT 369 or one semester of introductory plant pathology.**Description:** Pathogens, epidemiology, and control of diseases specific to turfgrass.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 815A Self-pollinated Crop Breeding****Crosslisted with:** ENTO 815A**Prerequisites:** AGRO 215**Description:** Self-pollinated plant breeding theory and methods. Pedigree, bulk, single seed descent, back-crossing methods and inbreeding theory.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**AGRO 815B Germplasm and Genes****Crosslisted with:** ENTO 815B**Prerequisites:** AGRO 215**Description:** Obtaining germplasm and genes from cultivated plants, wild relatives of cultivated plants, and the biosphere. Origination of crops, mutation genetics, biotechnology as a source of genes, chromosomal engineering and plant reproduction.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**AGRO 815D Cross-pollinated Crop Breeding****Crosslisted with:** ENTO 815D**Prerequisites:** AGRO 215**Description:** Cross-pollinated breeding theory and methods. Genes in populations, recurrent selection methods, creating populations, hybrid production practices, and population improvement theory.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**AGRO 816A Heterosis****Description:** Classical concepts of heterosis; genetic hypotheses for hybrid vigor; quantitative genetics of heterosis; new tools to study hybrid vigor, structure and function; organization of germplasm into heterotic groups; prediction of heterosis and hybrid performance; mechanisms for making hybrid seed; and breeding methods/concepts for developing hybrids in plants.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 816B Haploids and Doubled Haploids in Plant Breeding****Prerequisites:** AGRO 815A, B, and D**Description:** Variations in chromosome number, biology and technology of haploids/doubled haploids in higher plants, microspore embryogenesis, wide hybridizations, in vivo maize parthenogenesis-type, and radiation systems. Use of haploids in genetics research, DH systems in self-pollinated, cross-pollinated, and hybrid crop breeding.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 816E Genotype by Environment Interaction****Prerequisites:** AGRO 815A, B, and D, STAT 801A, 802 or equivalent course work**Description:** Types and causes of phenotype instability due to impacts of environmental factors. Topics include adaptation, impacts of G x E on selection and testing, selection of evaluation environments. Statistical concepts to describe/model interactions, breeding for reliability across unpredictable environments, precision phenotyping, selection for specific stresses, use of QTL's for abiotic and biotic stress stability.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING

AGRO 817 Plant Pathology Principles and Application**Crosslisted with:** PLPT 817, HORT 817**Prerequisites:** 12 hours of prior coursework in the plant sciences**Description:** Introduction to the biology of plant pathogenic organisms; pathogen-plant interactions; environmental influences; cultural, resistance, and chemical strategies for plant disease management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 818 Agricultural Biochemistry****Crosslisted with:** BIOC 818**Prerequisites:** Undergraduate major in life sciences or related area, and a course in biochemistry**Description:** A Web-based course. Biochemical underpinnings of agricultural production and processing systems. Agricultural biotechnology; bioenergetics; kinetics and enzyme regulation; interaction of biomolecules with light, photosynthesis and the balance between anabolism and catabolism in microbes, plants and animals.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** IND**Prerequisite for:** VBMS 919**AGRO 819 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** AGRO 419, GEOG 419, GEOL 419, NRES 420, GEOG 819, GEOL 819, NRES 820**Notes:** GEOG 418/NRES 418 recommended**Description:** Introduction to the practical uses of remote electromagnetic sensing in dealing with agricultural and water-resources issues.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**AGRO 820 Bioinformatics Applications in Agriculture****Crosslisted with:** AGRO 420**Prerequisites:** AGRO 215 Genetics or equivalent. Undergraduate students must be at the senior class level standing.**Description:** Introduction to applied computational methods to analyze biological data, efficiently manipulate large data sets, and automate workflows using Perl and Shell scripting. Learn strategies for assembling and analyzing data generated by modern high throughput sequencing platforms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**AGRO 821 Learning Biotechnology****Crosslisted with:** HORT 821**Description:** Investigate biotechnology and its application in solving problems and connect biotechnology to basic science concepts in biology and chemistry. Integrate individually-designed biotechnology lessons into learning standards.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 822 Integrated Weed Management****Crosslisted with:** HORT 822**Prerequisites:** 12 hrs AGRO and/or closely related HORT and/or BIOS**Description:** Principles and application of (IWM). Noxious and invasive weed species. Crops and weed control. Plant population shifts. Use of herbicides and the biologically effective dose. Critical period of weed control and weed threshold. Herbicide tolerant crops.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 824 Plant Nutrition and Nutrient Management****Crosslisted with:** HORT 824**Prerequisites:** AGRO 325 or basic course in plant physiology. A course in organic chemistry or biochemistry recommended**Notes:** Offered spring semesters.**Description:** Macro and micro nutrient elements and their function in the growth and development of plants. Role of single elements. Interaction and/or balances between elements and nutrient deficiency and/or toxicity symptoms as they affect the physiology of the whole plant. Relationship between crop nutrition and production and/or environmental considerations (e.g. yield, drought, temperature, pests).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 826 Invasive Plants****Crosslisted with:** AGRO 426, HORT 426, HORT 826, NRES 426, NRES 826**Prerequisites:** AGRO/HORT/SOIL 153; BIOS 109.**Description:** Identification, biology and ecology of weedy and invasive plants. Principles of invasive plant management by preventative, cultural, biological, mechanical and chemical means using an adaptive management framework. Herbicide terminology and classification, plant-herbicide and soil-herbicide interactions, equipment calibration and dosage calculations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 827 Turfgrass Systems Management****Crosslisted with:** AGRO 427, HORT 427, TLMT 427, HORT 827, TLMT 827**Prerequisites:** TLMT 227 and TLMT 327.**Description:** Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 828 Scientific Illustration****Crosslisted with:** ENTO 828, AGRI 828, HORT 828**Prerequisites:** 12 hrs agricultural and/or biological sciences.**Description:** Prepare scientifically accurate, high quality illustrations and graphics for the teaching, presentation, and publication of scientific information. Drawing techniques, drafting, copyright, and publication and presentation of scientific art work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AGRO 829A Food Security: A Global Perspective

Crosslisted with: ANTH 429A, ANTH 829A, AGRO 429A, HORT 429A, HORT 829A, NRES 429A, NRES 829A, NUTR 429A, NUTR 829A

Prerequisites: Junior standing

Description: Overview of the technical and sociocultural dimensions of global food insecurity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 831 Spatial Variability in Soils

Prerequisites: AGRO/SOIL 366 and STAT 801.

Notes: Offered spring semester of even-numbered years.

Description: Basic concepts of soil variability, its underlying causes. The impact spatial variability has on soil management, primarily for crop production. Geographic and geo-statistical concepts. Use of spatial information for more profitable crop production.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

AGRO 832 Learning Plant Science

Crosslisted with: HORT 832

Description: The biology of plants grown for food, fiber, fuel and fun. Connect applied plant science to basic science concepts in biology and chemistry. Integrate individually-designed plant science lessons into learning standards.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 834 Plant Biochemistry

Crosslisted with: AGRO 434, BIOC 434, BIOS 434, CHEM 434, BIOC 834, BIOS 834, CHEM 834

Prerequisites: BIOC/BIOS/CHEM 431/831.

Description: Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 835 Agroecology

Crosslisted with: AGRO 435, HORT 435, NRES 435, NRES 835

Prerequisites: For AGRO/HORT/NRES 435: Senior standing. For AGRO/NRES 835: 12 hrs biological or agricultural sciences.

Description: Integration of principles of ecology, plant and animal sciences, crop protection, and rural landscape planning and management for sustainable agriculture. Includes natural and cultivated ecosystems, population and community ecology, nutrient cycling, pest management, hydrologic cycles, cropping and grazing systems, landscape ecology, biodiversity, and socioeconomic evaluation of systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 836 Agroecosystems Analysis

Crosslisted with: AGRO 436, HORT 436, HORT 836

Prerequisites: Senior standing.

Notes: Cost of travel required. Summer travel course with multi-state faculty. Farm visits to Iowa, Minnesota and Nebraska.

Description: Analysis of production, economics, environmental impacts, and social integration aspects of farms and farming systems

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

AGRO 837 Animal, Food and Industrial Uses of Grain

Crosslisted with: AGRO 437

Prerequisites: CHEM 105 or 109, and one of the following: AGRO 204 or ASCI 250.

Description: Identification and comparison of grain quality characteristics desired by livestock feeders, human food processors and industrial users, and methods used to measure these characteristics.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

AGRO 838 Producing Grain for Animal, Food and Industrial Uses

Crosslisted with: AGRO 438

Prerequisites: CHEM 109 and one of the following: AGRO 204 or ASCI 250.

Notes: AGRO 215 and 437/837 recommended.

Description: Genetic development, production practices, and grain handling and storage procedures to deliver quality grain to livestock feeders, human food processors and industrial uses.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

AGRO 839 Organic Farming and Food Systems

Crosslisted with: AGRO 439, HORT 439, HORT 839

Prerequisites: Admission to the MS or PhD program

Description: History of organic farming and horticultural systems, organic certification, nutrient and pest management in organic systems, planning organic enterprises including production and marketing, resilience of organic systems in ecological, economic, and social terms; future issues and potentials of organic food systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 840 Great Plains Ecosystem

Crosslisted with: AGRO 440, NRES 840, RNGE 440, NRES 440

Prerequisites: Junior standing.

Notes: BIOS 101 and 101L, or equivalent, recommended.

Description: Characteristics of Great Plains ecosystems, interrelationships of ecological factors and processes, and their application in the management of grasslands. Interactions of fire, vegetation, grazing animals and wildlife.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 841 Perennial Plant Function, Growth, and Development

Crosslisted with: AGRO 441, HORT 441, HORT 841, RNGE 441

Prerequisites: AGRO 325 or equivalent.

Description: Principles of crop physiology and developmental morphology in relation to function, growth, development, and survival of perennial forage, range, and turf plants. The relationship of physiology and morphological development on plant use and management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 842 Wildland Plants

Crosslisted with: AGRO 442, NRES 842, RNGE 442, NRES 442

Prerequisites: Junior standing.

Notes: BIOS 101 and 101L, or equivalent, recommended.

Description: Wildland plants that are important to grassland and shrubland ecosystem management and production. Distribution, utilization, classification, identification (including identification by vegetative parts), uses by Native Americans, and recognition of grasses, fords, shrubs, exotic and wetland plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 843 Ecology of Invasive Species

Description: Ecological principles and their application to invasive species. Discussion of population level characteristics and community and ecosystem level effects of a wide variety of taxa including invasive microbial, fungal, plant, invertebrate, and vertebrate examples. Current global consequences and governmental policies/programs designed to limit the spread of invasives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 844 Ecosystem Monitoring and Assessment

Crosslisted with: AGRO 444, NRES 844, RNGE 444, NRES 444

Prerequisites: Junior standing.

Notes: NRES 220 or equivalent, recommended.

Description: Measurement and monitoring of the important vegetation and environmental factors used to develop management guidelines in grasslands, savannas, woodlands, and wetlands. Emphasis on using ecosystem monitoring protocols for assessment of wildlife habitat, fuels management for wild-land fire, livestock production, and watershed function. Requires field sampling and travel to local field sites.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 845 Livestock Management on Range and Pasture

Crosslisted with: AGRO 445, ASCI 451, ASCI 851, RNGE 445

Prerequisites: ASCI 250 and AGRO 240 or 340; AECN 201 recommended.

Notes: AECN 201 recommended. Capstone course. All students required to participate in a one-week field trip in central or western Nebraska prior to beginning of fall semester. Therefore, students must notify instructor at time of early registration (Dates are given in class schedule.)

Description: Analyzing the plant and animal resources and economic aspects of pasturage. Management of pasture and range for continued high production emphasized.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 846 Forage Quality

Crosslisted with: ASCI 824

Prerequisites: AGRO/RNGE 240 and ASCI 320, or equivalents; 3 cr hrs of introductory statistics; and permission

Description: The chemical characteristics of forage components. The interactions with ruminant physiology and digestion that influence forage feeding value. The laboratory procedures used to evaluate forages for grazing livestock.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: IND

AGRO 847 Grassland Fire Ecology

Prerequisites: BIOS 101 and 101L, or equivalent, recommended

Description: Ecological effects of fire on grassland ecosystems. Insight into the history of fires, the people who use them and why, the parts of a fire, how fires behave in relation to fuel and weather, and the conducting and safety of prescribed burns

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 848 Grassland Monitoring and Assessment

Prerequisites: BIOS 101 and 101L; and AGRO 240, or their equivalents, recommended.

Description: Vegetation sampling theory and plot selection. Quantitative measures used in vegetation analysis, root growth, and utilization. Similarity index, health, and trend for grassland monitoring and assessment. Use of basic statistics and the microcomputer to analyze data sets comparing methods for determination of biomass, basal cover, frequency, and density.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

AGRO 849 Watershed Management in Grasslands

Prerequisites: BIOS 101 and 101L; NRES 220; and AGRO 240, or their equivalents, recommended

Description: Management of physical/biological settings and processes along with human activities on water and watersheds considering preventative and restorative strategies in a natural resource range-land setting.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 850 Climate and Society

Crosslisted with: AGRO 450, GEOG 450, METR 450, NRES 452, GEOG 850, METR 850, NRES 852

Prerequisites: Junior standing or above.

Notes: Offered spring semester of even-numbered calendar years.

Description: Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

Groups: Physical Geography

AGRO 851 Grassland Plant Identification

Prerequisites: BIOS 101 and 101L; and AGRO 240, or their equivalents, recommended

Description: Study of plants that have ecological and/or agricultural importance in the Great Plains. Plant identification, grassland ecosystems and plants forage value, palatability, and utilization by both domestic livestock and wildlife. Cultural and historical uses of grassland.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

AGRO 852 Grazing Ecology and Management

Description: This course discusses the ecological principles of domesticated livestock grazing and their application to manage grazing lands. Theoretical and applied models of plant/animals interactions will be presented. Grazing systems and their management of ecosystem services will be presented as balance between production and conservation outcomes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 855 Soil Chemistry and Mineralogy

Crosslisted with: AGRO 455, NRES 455, NRES 855, SOIL 455

Prerequisites: AGRO/HORT/SOIL 153 or GEOL 101; CHEM 109 and 110; CHEM 221 or 251; or equivalent.

Description: Chemical and mineralogical properties of soil components. Inorganic colloidal fraction. Structures of soil minerals as a means of understanding properties, such as ion exchange and equilibria; release and supply of nutrient and toxic materials; and soil acidity and alkalinity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AGRO 858 Soil Physical Determinations

Crosslisted with: AGRO 458, NRES 458, NRES 858, SOIL 458

Prerequisites: SOIL/AGRO/GEOL/WATS 361; PHYS 141 or equivalent; MATH 102 or 103.

Description: Survey of measurement techniques and principles used in characterizing the physical properties of soils. Includes analysis of experimental design and sources of experimental error. Techniques include: particle size analysis, soil water content, pore size analysis, field sampling techniques, soil strength, and saturated hydraulic conductivity.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LAB

AGRO 860 Soil Microbiology

Crosslisted with: AGRO 460, BIOS 460, NRES 460, SOIL 460, BIOS 860, NRES 860

Prerequisites: One semester microbiology; one semester biochemistry or organic chemistry.

Description: Soil from a microbe's perspective-growth, activity and survival strategies; principles governing methods to study microorganisms and biochemical processes in soil; mechanisms controlling organic matter cycling and stabilization with reference to C, N, S, and P; microbial interactions with plants and animals; and agronomic and environmental applications of soil microorganisms.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

AGRO 861 Soil Physics

Crosslisted with: AGRO 461, GEOL 461, NRES 461, SOIL 461, WATS 461, GEOL 861, NRES 861

Prerequisites: AGRO/SOIL 153; PHYS 141 or equivalent, one semester of calculus.

Description: Principles of soil physics. Movement of water, air, heat, and solutes in soils. Water retention and movement, including infiltration and field water regime. Movement of chemicals in soils.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGEN 955, AGRO 955, CIVE 955, GEOL 985

AGRO 869 Bio-Atmospheric Instrumentation

Crosslisted with: AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, GEOG 869, HORT 807, METR 869, MSYM 869, NRES 869

Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.

Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Physical Geography

AGRO 872 Applied Soil Physics**Crosslisted with:** AGRO 472, NRES 472, NRES 872, SOIL 472, WATS 472**Prerequisites:** AGRO/HORT/SOIL 153 or equivalent; MATH 104 or MATH 106 or equivalent.**Description:** Emphasis on applied soil physics. Discussion of theoretical principles followed by field and laboratory exercises and applications. Fluxes of water, solutes, air, and heat through the soil. Emphasis on water infiltration, water retention, other soil hydraulic properties. Components of soil water balance. Management of soil water.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475, POLS 875**Prerequisites:** Senior standing.**Notes:** Capstone course.**Description:** Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**AGRO 878 Plant Anatomy****Crosslisted with:** BIOS 478, BIOS 878, AGRO 478, HORT 478, HORT 878**Prerequisites:** 8 hrs biological sciences**Notes:** BIOS 109 recommended.**Description:** Development, structure, and function of tissues and organs of the higher plants. Relationships of structure to physiology and ecology of plants.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 879**AGRO 880 Modified Rootzones****Crosslisted with:** AGRO 480, HORT 480, TLMT 480, TLMT 880, HORT 880**Notes:** Offered as a five-week course.**Description:** Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 884 Water Resources Seminar****Crosslisted with:** AGRO 484, GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, GEOG 884, GEOL 884, WATS 884**Prerequisites:** Junior or above standing**Description:** Seminar on current water resources research and issues in Nebraska and the region.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AGRO 888 Business Management for Agricultural Enterprises****Crosslisted with:** HORT 488, HORT 888, EAEP 488, AGRO 488, ENTR 488, EAEP 888, ENTR 888, ABUS 488**Description:** Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. Requires the completion of a shadowing assignment and the analysis of case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 889 Urbanization of Rural Landscapes****Crosslisted with:** AGRO 489, CRPL 489, HORT 489, HORT 889, CRPL 889**Prerequisites:** Senior standing or graduate standing.**Description:** Development converts rural landscapes into housing, roads, malls, parks, and commercial uses. This process fragments landscapes and changes ecosystem functions, drives up land prices, and pushes agriculture into more marginal areas. This multi-disciplinary, experiential course guides students in learning about the urbanization process, the impacts on landscapes, people, and the community, and the choices that are available to informed citizens.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 894 Graduate Degree Project Credits****Crosslisted with:** HORT 894**Prerequisites:** Admission to Master of Agronomy or Horticulture degree program**Notes:** Project activity for the nonthesis option II MS degree.**Description:** Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**AGRO 896 Independent Study****Crosslisted with:** AGRO 496, RNGE 496, SOIL 496**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** IND

AGRO 897 Master of Applied Science Project**Crosslisted with:** AGRI 897, HORT 897, NRES 897**Prerequisites:** Admission to Master of Applied Science degree program**Notes:** Project activity for the Master of Applied Science degree.**Description:** Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**AGRO 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser.**Notes:** P/N only.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**AGRO 906 Crop Growth and Yield Modeling****Crosslisted with:** NRES 906**Prerequisites:** AGRO 325/HORT 325 Introductory Plant Physiology or equivalent**Notes:** Recommended: AGRO 406/806 NRES 406/806 HORT 406/806 Plant Ecophysiology or equivalent.**Description:** Understanding and use of crop simulation models and ability to build crop models. Studying principles and quantitative descriptions of crop production ecology. Offered fall semester of odd-numbered calendar years.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 907 Agricultural Climatology****Crosslisted with:** HORT 907, METR 907, NRES 907**Prerequisites:** NRES 808; STAT 801A or equivalent**Description:** Offered spring semester of odd-numbered calendar years. Analysis and use of climatological data as applied to agricultural activities and the use of climatological information to assist in decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**AGRO 919 Plant Genetics****Crosslisted with:** HORT 919**Prerequisites:** AGRO 215**Description:** Focus student learning on principles related to mendelian, population, and molecular genetics of plants including allelisms, nonallelic gene interaction, linkage and recombination, mode of inheritance, mutation, epigenetics, DNA-based markers and mapping techniques, inheritance of qualitative and quantitative traits, and plant transformation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 920 Xenobiotics in the Environment****Crosslisted with:** ENTO 920, EOHT 920, HORT 920, NRES 920**Prerequisites:** Recommend one course each in organic chemistry, soil science, biochemistry, plant physiology, microbiology and ecology**Description:** Fate and ecotoxicological impacts of biologically foreign compounds in soil-water-plant environments; uptake, mechanisms of toxicity and metabolism in plants and other biota. Herbicides and other pesticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 931 Population Genetics****Crosslisted with:** ASCI 931, HORT 931**Prerequisites:** AGRO 215 and STAT 801A**Description:** Structure of populations, forces affecting gene frequency and frequency of genotypes, continuous variation, population values and means, genotypic and environmental variances and covariances.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** AGRO 932, STAT 847; ASCI 932; ASCI 933; ASCI 944, STAT 844**AGRO 932 Biometrical Genetics and Plant Breeding****Crosslisted with:** STAT 847**Prerequisites:** AGRO 931**Notes:** STAT 802 recommended. Offered odd-numbered calendar years.**Description:** Theoretical concepts involved in planning breeding programs for the improvement of measurable morphological, physiological, and biochemical traits that are under polygenic control in crop plants of various types.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 940 Forage Evaluation****Crosslisted with:** ASCI 924**Prerequisites:** Permission**Description:** Offered even-numbered calendar years. Analytic procedures and research methods used in evaluating biochemical components and nutritive value of forages. An evaluation of the impact of forage quality on forage breeding and animal performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AGRO 955 Solute Movement in Soils**Crosslisted with:** AGEN 955, CIVE 955, GEOL 985**Prerequisites:** MATH 208; AGRO 861 or GEOL 888 or MSYM 852 or CIVE 858**Description:** Examination of the theory and experimental evidence available to characterize the movement of chemicals in soil. Both saturated and unsaturated flow conditions examined. Initial presentation of basic theoretical concepts. Remainder of class a discussion of the literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 963 Genetics of Host-Parasite Interaction****Crosslisted with:** HORT 963, PLPT 963**Prerequisites:** BIOS 820; and permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AGRO 965 Plant Virology****Crosslisted with:** PLPT 965, HORT 965**Prerequisites:** PLPT 801 or 802; and permission.**Notes:** PLPT 865 is offered odd-numbered calendar years.**Description:** Virus molecular biology; virosphere; virus-vector relationships; plant resistance to virus infection economic impact and control of plant diseases by viruses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**AGRO 968 Seminar in Plant Pathology****Crosslisted with:** PLPT 968, HORT 968**Prerequisites:** Permission.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**AGRO 991 Seminar Presentation and Evaluation****Crosslisted with:** HORT 991**Description:** Various topics in horticulture, agronomy or related subjects. Emphasis on techniques.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 2**Format:** LEC**AGRO 992 General Seminar****Crosslisted with:** HORT 992, NRES 992**Notes:** Agronomy and Horticulture PhD students should enroll in this course twice.**Description:** Expected of all Agronomy and Horticulture graduate students. Presentation of thesis/dissertation or non-thesis topics in agronomy, horticulture or related subjects. Agronomy and Horticulture PhD students should enroll in this course twice.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** LEC**AGRO 996 Research in Crops****Prerequisites:** 12 hrs agronomy or closely related sciences and permission**Credit Hours:** 2-5**Min credits per semester:** 2**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**AGRO 996A Research in Soils****Crosslisted with:** NRES 996A**Prerequisites:** 12 hrs AGRO or closely related sciences, and permission**Credit Hours:** 2-5**Min credits per semester:** 2**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**AGRO 999 Doctoral Dissertation****Crosslisted with:** HORT 999**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Animal Science (ASCI)

ASCI 806 Animal Science Graduate Seminar**Prerequisites:** Permission**Description:** Orientation in the animal science graduate program involving introduction to departmental research program, philosophy, and policies.

Discussion of elements of an effective seminar; experience and critique in oral presentation of research data.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 2**Format:** LEC**ASCI 810 Processed Meats****Crosslisted with:** ASCI 410**Prerequisites:** ASCI 210 or equivalent. Junior standing.**Notes:** 3 cr II classroom. 3 cr I, II, III web.**Description:** ASCI 485 is for majors in the College of Agricultural Sciences and Natural Resources with an interest in careers in livestock production units, the meat industry, or related agribusiness.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 817 Meat Technology****Prerequisites:** ASCI 410 or permission**Description:** Meat processing and fabrication technology. Practical application of tenderization, restructuring, freezing, dehydration, flavor modification, composition control and quality control technology to manufactured and processed meat products.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

ASCI 819 Meat Investigations**Crosslisted with:** ASCI 419, FDST 419, FDST 819**Prerequisites:** ASCI 210**Description:** Conduct independent research and study meat industry problems in processing, production, storage, and preparation of meat and meat products.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 820 Feedlot Nutrition and Management****Prerequisites:** CHEM 831**Notes:** Offered odd-numbered calendar years.**Description:** Nutritional requirements of and complete ration formulation for feedlot cattle. Management practices needed for successful feedlot operation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 821 Advanced Animal Nutrition****Crosslisted with:** ASCI 421**Prerequisites:** ASCI 320**Description:** Advanced course dealing with the nutrition of domestic animals. In-depth coverage of nutrients, nutrient metabolism, and nutrient requirements. Biochemical and physiological functions of nutrients in life processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927**ASCI 822 Advanced Feeding and Feed Formulation****Crosslisted with:** ASCI 422**Prerequisites:** ASCI 320 or equivalent.**Description:** Feeding practices for domestic animals. Applied animal nutrition and feed formulation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 824 Forage Quality****Crosslisted with:** AGRO 846**Prerequisites:** AGRO/RNGE 240 and ASCI 320, or equivalents; 3 cr hrs of introductory statistics; and permission**Description:** The chemical characteristics of forage components. The interactions with ruminant physiology and digestion that influence forage feeding value. The laboratory procedures used to evaluate forages for grazing livestock.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**ASCI 831 Advanced Animal Breeding****Crosslisted with:** ASCI 431**Prerequisites:** ASCI 330**Description:** Application of genetic principles to animal breeding. Critical examination of current and potential selection programs and crossbreeding systems. Determination of performance objectives. Expected responses to selection methods and dissemination of improvement in an industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 832 Genome Analysis****Crosslisted with:** ASCI 432**Prerequisites:** AGRO 215 and BIOC 321 or equivalent**Description:** Theoretical and practical aspects of: structure and function of eukaryotic genomes; genome sequencing and assembling, polymorphism and isoform detection and genotyping; gene and genome annotation; strategies used to identify genetic variants responsible for phenotypic differences; and personalized genomics, social and ethical aspects associated with genomic information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**ASCI 841 New Techniques in Reproductive Biology****Crosslisted with:** ASCI 441**Prerequisites:** ASCI 341 or equivalent.**Description:** Mammalian early embryonic development. Basic aspects of embryology and development biology. Modern technologies in animal reproductive biology, in vitro maturation and fertilization, embryo transfer, cloning, assisted reproductive technologies, transgenic animals, and embryonic stem cells.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 842 Endocrinology****Crosslisted with:** ASCI 442, BIOS 442, BIOS 842, VBMS 842**Prerequisites:** A course in vertebrate physiology and/or biochemistry.**Description:** Mammalian endocrine glands from the standpoint of their structure, their physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ASCI 843 Physiology of Animal Cells and Tissues**Crosslisted with:** ASCI 443**Prerequisites:** LIFE 121; ASCI 240 or ASCI 340 or BIOS 213; BIOC 321 or BIOC 431.**Description:** Molecular, cellular, and tissue dependent functions of neurons, skeletal and smooth muscle, vasculature, and immune cells. Cellular regulation of important physiological processes including blood flow, gas exchange, inorganic solute homeostasis, acid-base balance, water balance, appetite control, and thermal regulation will also be studied. Understand cellular and molecular processes that ensure homeostasis and promote integration of physiological systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**ASCI 845 Animal Physiology I****Crosslisted with:** VMED 645, VBMS 845**Prerequisites:** Undergraduate courses in biochemistry, biology and physiology.**Notes:** Primarily for students in animal or biological sciences or veterinary medicine.**Description:** Mammalian physiology and cellular mechanisms. Physiology of the cell, embryology, and neuro-sensory, neuromuscular, endocrine, and reproductive systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ASCI 846 Animal Physiology II****Crosslisted with:** VMED 646, VBMS 846**Prerequisites:** ASCI/VBMS 845 or BIOS 813**Notes:** ASCI/VBMS 846/BIOS 814/VMED 646 is designed for students in animal or biological sciences or veterinary medicine.**Description:** Mammalian physiology and cellular mechanisms. Physiology of the digestive, cardiovascular, respiratory, and renal systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ASCI 847 Interdisciplinary Concepts in Beef Production****Crosslisted with:** VBMS 847**Prerequisites:** Degree in veterinary medicine or animal science, or allied agricultural degree**Notes:** Classroom attendance is required during each of the modules. Between modules distance education technologies (laptop computer, Internet access, a computer operating system with a word processor, spreadsheet, and presentation software, email, etc.) are used and required for discussion and assignments.**Description:** The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**ASCI 847A Interdisciplinary Concepts in Beef Production I****Crosslisted with:** VBMS 847A**Description:** The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 847B, VBMS 847B**ASCI 847B Interdisciplinary Concepts in Beef Production II****Crosslisted with:** VBMS 847B**Prerequisites:** VBMS 847A**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 851 Livestock Management on Range and Pasture****Crosslisted with:** AGRO 445, AGRO 845, ASCI 451, RNGE 445**Prerequisites:** ASCI 250 and AGRO 240 or 340; AECN 201 recommended.**Notes:** AECN 201 recommended. Capstone course. All students required to participate in a one-week field trip in central or western Nebraska prior to beginning of fall semester. Therefore, students must notify instructor at time of early registration (Dates are given in class schedule.)**Description:** Analyzing the plant and animal resources and economic aspects of pasturage. Management of pasture and range for continued high production emphasized.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 860 Quantitative Genetics Applications of Matrix Algebra****Prerequisites:** Graduate Standing in the College of Agricultural Sciences and Natural Resources.**Notes:** This is a five week course taught by Lewis (UNL)**Description:** Principles in matrix algebra to describe and solve problems in the agricultural and life sciences, and particularly quantitative genetics. Material includes vocabulary, concepts, and, to a lesser extent, theory of matrix algebra, with application to ecological systems, genotypic transition matrices, selection indices, and the numerator relationship matrix. With matrix algebra, use least squares procedures and canonical transformation to solve problems in biological sciences.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 861U

ASCI 861U Primer to Quantitative Genetics**Prerequisites:** ASCI 860**Notes:** This is a 5 week course taught by Lewis (UNL).**Description:** Language and foundational principles of quantitative genetics. Material includes basic model for quantitative genetics (additive and non-additive genetic effects, including Mendelian sampling, and environmental effects), sources of variation, heritability, family resemblance and repeatability, selection response, and family selection. Define expected values and concepts in applied statistics.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 861V; ASCI 944, STAT 844**ASCI 861V Selection Index Theory and Application****Prerequisites:** ASCI 861U**Notes:** This is a 5-week course taught by Lewis (UNL).**Description:** Theory and application of selection indices. Material includes design of animal breeding programs, estimating selection response, constructing economic selection indices, and developing multiple-stage selection strategies. Introduces approaches for deriving economic weights, and predicting economic response to selection.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 861W; ASCI 862U; ASCI 866**ASCI 861W Economic Breeding Programs****Prerequisites:** ASCI 861V**Notes:** This is a 5-week course taught by MacNeil (Delta G) and Lewis (UNL).**Description:** Principles for developing an economic basis for multiple-trait selection to improve the profitability of production. Material includes review of concepts relevant to the selection index, introduction to the concept of systems analysis, linear programming, and simulation with emphasis on economic values useful for selection index. Critically analyze relevant literature.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 862U Linear Models in Animal Breeding****Prerequisites:** ASCI 861V**Notes:** This is a 5-week course taught by Spangler (UNL).**Description:** Principles of linear models used in animal breeding. Models discussed in the context of the random variable that is to be predicted. Material includes animal models, sire/maternal grandsire models, and sire models, models with a single and repeated records, and models with both direct and maternal effects.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 862V**ASCI 862V Genetic Prediction****Prerequisites:** ASCI 862U**Notes:** 5-week course taught by Enns (Colorado State University).

Permission required before registering. Contact the Animal Science Department at 402-472-6440.

Description: Principles for using best linear unbiased prediction (BLUP) in genetic prediction. Material includes data integrity diagnosis, contemporary grouping strategies, adjusting for known non-genetic effects, the AWK Programming Language, UNIX/Linux scripting, and use of modern computational tools to perform genetic evaluations. Emphasis on real-world datasets designed to develop applied analytical skills in animal breeding.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 862W, STAT 862W; ASCI 863U; ASCI 867**ASCI 862W Applied Variance Component Estimation in Livestock Genetics****Crosslisted with:** STAT 862W**Prerequisites:** ASCI 862V**Notes:** This is a 5-week course taught by Speidel and Enns (Colorado State University). Permission required before registering. Contact the Animal Science Department at 402-472-6440.**Description:** Principles in the estimation of (co)variance components and genetic parameters required to solve mixed models typical in livestock genetics. Focus on applied knowledge of approaches used to estimate the G and R sub-matrices of the mixed model equations. Demonstrate models commonly used in parameter estimation. Introduce scientific literature concerning implementation, and attributes of the solutions, of variance component estimation strategies.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 863U Marker-Assisted and Gene-Assisted Selection****Prerequisites:** ASCI 862V**Notes:** This is a 5-week course taught by Enns (Colorado State University). Permission required before registering. Contact the department at 402-472-6440.**Description:** Methods for incorporating genetic marker information into selection decisions in livestock. Consider statistical methodologies necessary to analyze large data available from new DNA technologies related to livestock genomes. Material includes recombination, single-gene tests, molecular breeding values, suggested producer guidelines for use of the technologies, and incorporation of genomic information into genetic prediction procedures.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 863V

ASCI 863V Introduction to Marker Association Analysis and QTL Detection**Prerequisites:** ASCI 863U**Notes:** This is a 5-week course taught by Dekkers (Iowa State University). Permission is required before registering. Contact the department at 402-472-6440.**Description:** Methodologies for using genetic markers to identify Quantitative Trait Loci (QTL) and for estimating marker-trait associations in livestock populations. Material includes the basics of linkage and linkage disequilibrium, alternate designs or population structures for QTL mapping, and statistical methods for QTL detection and genome-wide association analyses. Introduce properties and requirements of alternate designs and analysis strategies.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 863W**ASCI 863W From Markers to Gene Function: Functional Change****Prerequisites:** ASCI 863V**Notes:** This is a 5-week course taught by Thomas and Enns (Colorado State University).**Description:** Extend concepts of marker association analyses to the translation of genetic markers into functional changes in the animal genome, and impacts on animal performance, in livestock genetic improvement programs. Material includes introduction to the tools used to generate genomic data, and application of key bioinformatics websites and databases to identify causative genetic variation, and to develop gene pathways and networks**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 864 CyberSheep: a Genetic Simulation Game****Prerequisites:** Graduate Standing**Notes:** This is a 10 week course taught by Lewis (UNL).**Description:** Principles of genetic selection and mating strategies applied in livestock breeding programs. Through use of a web-based genetic simulation game (CyberSheep), develop skills in implementing a virtual animal breeding program, assess the outcomes of decision-making in terms of genetic response, inbreeding, and economic returns, and experience stochastic elements inherent to livestock systems.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 865 History and Perspectives in Animal Breeding and Genetics****Prerequisites:** Graduate Standing**Notes:** This is a 5 week course taught by Spangler and Lewis (UNL).**Description:** Historical perspective to the discipline of animal breeding and genetics. Introduction to the contributions of geneticists who have significantly impacted the discipline. Material includes pre-recorded interviews of scientists that have had an international impact in animal breeding and genetics. Critique key papers.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 866 Heterosis and Crossbreeding Systems****Prerequisites:** ASCI 861V**Notes:** This is a 5-week course taught by Cassady (South Dakota State University).**Description:** Principles of heterosis and mating systems utilizing crossbreeding. Material includes models for breed and crossbreeding effects, genetic basis of heterosis, recombination effects, composite populations, estimation of crossbreeding parameters, applications of line breeding and line crossing, and evaluation and utilization of crossbreeding systems.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 867 Prediction and Control of Inbreeding in Breeding Programs****Prerequisites:** ASCI 862V**Notes:** This is a 5-week course taught by Dekkers (Iowa State University).**Description:** Principles in the prediction and control of inbreeding in livestock breeding program. Material includes definition of inbreeding and identity by descent, impacts of inbreeding on genotype frequencies, trait means and variances, random drift, computation of inbreeding coefficients in pedigreed populations, prediction of rates of inbreeding in closed populations, and control and management of inbreeding in breeding populations.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 868 An Introduction to R Programming****Crosslisted with:** STAT 868**Prerequisites:** Graduate Standing**Notes:** This is a 5-week course taught by Maltecca (North Carolina State University).**Description:** Introduction to the R environment for statistical computing, including use of R as a high-level programming language and as a gateway for more formal low-level languages. Material includes language structure, basic and advanced data manipulation, statistical analysis with R, and using R as a programming language.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** ASCI 869, STAT 869**ASCI 869 MCMC Methods in Animal Breeding: A Primer****Crosslisted with:** STAT 869**Prerequisites:** ASCI 868**Notes:** This is a 5-week course taught by Maltecca (North Carolina State University).**Description:** Principles of Markov Chain Monte Carlo (MCMC) methods in animal breeding. Materials include random variable generation, Monte Carlo integration, stochastic search, Expectation-maximization (EM) algorithm and Monte Carlo EM, Markov Chain principles, Metropolis-Hastings algorithm, Gibbs sample, and MCMC for genomic data. Illustrations developed using R software.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

ASCI 896 Independent Study in Animal Science**Crosslisted with:** ASCI 496**Prerequisites:** 12 hrs animal science or closely related areas and permission**Description:** Individual or group projects in research, literature review, or extension of course work under the supervision and evaluation of a departmental faculty member.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 12**Format:** IND**ASCI 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ASCI 905 Animal Industry Seminar****Prerequisites:** Permission**Description:** Current problems in the field of animal industry.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 4**Format:** LEC**ASCI 917 Advanced Meat Science****Prerequisites:** CHEM 831 and FDST 848**Description:** Molecular events occurring during the conversion of muscle to meat. Molecular and cellular properties of meat responsible for the functional and palatability properties of meat products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 918 Growth and Development of Meat Animals****Prerequisites:** Strong background in biological sciences**Notes:** ASCI/VBMS 845 and 846 recommended. BIOC, BIOS, and CHEM 831 and 832 advised.**Description:** Growth and development of livestock animals with emphasis on the prenatal and postnatal differentiation and development of skeletal muscle, bone, and adipose tissue; organ growth discussed. Recent literature as well as classical concepts of animal growth discussed along with the genetic, hormonal, and nutritional factors that affect growth.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 921 Interdepartmental Nutrition Seminar****Crosslisted with:** NUTR 921**Prerequisites:** Permission**Description:** Presentation and discussion of current literature and research in the field of nutrition.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ASCI 922 Advanced Animal Nutrition (Ruminant)****Description:** Nutrient metabolism and utilization by ruminant animals for maintenance, growth, finishing, reproduction and lactation. Major emphasis on protein and energy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 924 Forage Evaluation****Crosslisted with:** AGRO 940**Prerequisites:** Permission**Description:** Offered even-numbered calendar years. Analytic procedures and research methods used in evaluating biochemical components and nutritive value of forages. An evaluation of the impact of forage quality on forage breeding and animal performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 925 Energy Metabolism****Crosslisted with:** NUTR 925**Prerequisites:** ASCI 821, BIOC 831, or NUTR 455 or 950**Notes:** Offered odd-numbered calendar years.**Description:** Critically evaluate how research in bioenergetics has contributed to scientific discoveries in the fields of nutrition, biochemistry, and physiology. Methodologies for determination of human and animal energy expenditure and body composition. Specifically, direct calorimetry, indirect calorimetry and comparative slaughter techniques. Emphasis on components of organ and tissue energy expenditures.

Background information important in other nutrition courses.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 926 Carbohydrate and Lipid Nutrition****Crosslisted with:** NUTR 926**Prerequisites:** BIOC 831, ASCI 821 or NUTR 455 or 950**Notes:** Offered even-numbered calendar years.**Description:** Nutrition and metabolism of carbohydrates and lipids by animals and humans. Emphasis on fundamental principles and current concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 927 Protein and Amino Acid Nutrition****Crosslisted with:** NUTR 927**Prerequisites:** ASCI 421/821 or NUTR 455 or 950; BIOC/BIOS/ CHEM 431/831**Notes:** Offered even-numbered calendar years.**Description:** Nutrition and metabolism of proteins and amino acids by animals and humans. Fundamental principles and current concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ASCI 931 Population Genetics**Crosslisted with:** AGRO 931, HORT 931**Prerequisites:** AGRO 215 and STAT 801A**Description:** Structure of populations, forces affecting gene frequency and frequency of genotypes, continuous variation, population values and means, genotypic and environmental variances and covariances.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGRO 932, STAT 847; ASCI 932; ASCI 933; ASCI 944, STAT 844**ASCI 932 Quantitative Animal Genetics I****Prerequisites:** ASCI 931 or equivalent**Notes:** Offered even-numbered calendar years.**Description:** Use of biometrical and population genetics and related physiology, nutrition, pathology, meats, and economics, to develop intrapopulation breeding methods capable of increasing the net bio-economic efficiency of animal production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 933 Quantitative Animal Genetics II****Prerequisites:** ASCI 931**Notes:** Offered odd-numbered calendar years.**Description:** Evaluation of methods for developing and exploiting genetic diversity among animal populations to improve bio-economic efficiency of animal production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASCI 944 Quantitative Methods for Genomics of Complex Traits****Crosslisted with:** STAT 844**Prerequisites:** ASCI 861U or AGRO/ASCI/HORT 931 or BIOS 818 or equivalent; STAT 802 or 821 or equivalent.**Description:** Quantitative genetic analysis of complex traits. Quantitative methodologies for connecting phenotypes with high-dimensional genomic information to understand polygenic traits from both prediction and inference perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**ASCI 949 Biochemistry of Nutrition****Crosslisted with:** BIOC 949, BIOS 949, NUTR 949**Prerequisites:** BIOC 832 or 839**Notes:** Offered odd-numbered calendar years.**Description:** Offered odd-numbered calendar years. Interrelationships of nutrients, nutritional state and metabolic processes. Energy metabolism, integration of nutrition and metabolism and nutritional regulation of gene function.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ASCI 996 Problems in Animal Production****Prerequisites:** Permission**Description:** Methods employed in livestock production research. Planning and conducting experiments, keeping records, and analysis of data.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**ASCI 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Anthropology (ANTH)

ANTH 806 Visualizing the Ancient City**Crosslisted with:** AHIS 406, AHIS 806, ANTH 406, CLAS 406, CLAS 806**Prerequisites:** Junior standing.**Notes:** Recommend some background knowledge of ancient art, history, or languages, a general background course such as AHIS 101, ANTH 252, CLAS 209/CLAS 210, or any of the courses listed in the Archaeology or Digital Humanities minors. Computer/design skills welcome but not necessary.**Description:** A new approach to looking at the history and development of ancient cities, combining history and archaeology with digital methods, in particular 3D modeling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 810 Gender: An Anthropological Perspective****Crosslisted with:** ANTH 410, WMNS 410, WMNS 810**Prerequisites:** 6 hrs ANTH**Description:** Theoretical approaches to gender. Emphasis is placed on cross-cultural differences in gender socialization of as it pertains to sexual behavior, power within domestic and public spheres, and the impact of gender on individual aspirations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 812 Family, Marriage, and Kinship****Crosslisted with:** ANTH 412**Prerequisites:** ANTH 212.**Description:** Cross-cultural variation in family, marriage, and kinship and theories that account for variation in these fundamental areas of social life.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology

ANTH 816 Digital Anthropologies**Crosslisted with:** ANTH 416**Prerequisites:** 12 hours of anthropology or graduate student standing**Description:** Survey of digital methods and emergent technologies in Anthropology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 817 History of Anthropological Theory****Crosslisted with:** ANTH 417**Prerequisites:** 9 hrs ANTH.**Description:** Origins and developments of anthropological theory, method, and thought. Historical growth of the discipline and schools of thought from The Enlightenment through The Contemporary Period.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 818 Ethnology and Museums****Crosslisted with:** ANTH 418**Prerequisites:** 6 hours of anthropology including ANTH 212.**Description:** Explores historical and contemporary aspects of the missions, ethical and political issues concerning exhibits and collections held by museums.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 819 Art and Anthropology of Native North Americans****Crosslisted with:** ANTH 419**Description:** Explores the art of indigenous peoples in the United States. A spectrum of styles, contexts and symbolic meaning will be studied in addition to social aspects of taste, and issues concerning cultural appropriation and the repatriation of religious iconography.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 822 Medical Anthropology****Crosslisted with:** ANTH 422**Description:** Focuses on theoretical and applied significance of health related practices in local and cross-cultural contexts. Cultural constructions of disease, intervention and treatment strategies explored historically and contemporarily.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Biological Anthropology**ANTH 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, AGRO 429A, AGRO 829A, HORT 429A, HORT 829A, NRES 429A, NRES 829A, NUTR 429A, NUTR 829A**Prerequisites:** Junior standing**Description:** Overview of the technical and sociocultural dimensions of global food insecurity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 830 Nutritional Anthropology****Crosslisted with:** ANTH 430, NUTR 430, NUTR 830**Prerequisites:** ANTH 242 or equivalent.**Description:** Anthropological approaches to the study of nutrition. Background to nutrition science; bio-cultural aspects of obesity, fertility, lactose intolerance, and infant feeding practices; biological differences in nutritional requirements, fertility, and mortality; interpretation of nutritional deficiencies in skeletal remains; reconstructing prehistoric diets from archaeological evidence; and evaluation of relationships between dietary patterns and dental remains in fossil record.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Biological Anthropology**ANTH 831 Historical Archaeology: Current Topics****Crosslisted with:** ANTH 431**Description:** Development of Historical Archaeology and current research in the field.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 832 History and Theory of Archaeology****Crosslisted with:** ANTH 432**Prerequisites:** 9 hrs ANTH.**Description:** Current concepts and theories used in archaeology to interpret the archaeological record.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**ANTH 833 North American Archaeology****Crosslisted with:** ANTH 433**Prerequisites:** 9 hrs ANTH including ANTH 232**Description:** An areal survey of North American archaeology, methodology, history, and current trends of research. North American prehistory from earliest occupations to The Contact Period.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology

ANTH 834 Introduction to Great Plains Archaeology**Crosslisted with:** ANTH 434**Prerequisites:** 9 hrs ANTH including ANTH 232.**Description:** Introduction to the history of archaeological research, taxonomic issues, cultural sequences, and current research topics within the Great Plains area of North America.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**ANTH 835 Introduction to Heritage Management Archaeology****Crosslisted with:** ANTH 435**Prerequisites:** ANTH 232**Description:** Introduction to the nature and purpose of historic preservation as it pertains to resource management and archaeological research. Legislation that forms the basis for: cultural resource management principles; integration of state programs; and archaeological contractors; within the overall framework of land modification planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**ANTH 836 The Ancient Maya****Crosslisted with:** ANTH 436, LAMS 436**Description:** Introduction to the prehistory of the Maya region and its periphery. Features of the Ancient Maya political, economic, religious, gender and material structures. Main substantive, theoretical and political debates in Mesoamerican scholarship. Interdisciplinary research and the types of methods used to create knowledge about Maya civilization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**ANTH 837 Cultural Heritage of the American Southwest****Prerequisites:** Graduate student standing**Description:** Advanced survey of past and present indigenous cultures and heritage of the American Southwest.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 838 Archaeologies of Europe****Crosslisted with:** ANTH 438, CLAS 438, CLAS 838**Description:** Survey of the material remains of Europe and of the various approaches to the study of the European past.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**ANTH 842 Human Variation****Crosslisted with:** ANTH 442**Description:** Biological variation of modern humans worldwide through time and space. Standard measurements of phenotypic, e.g. elementary anthropometry. Biological adaptation to environment using recent theoretical perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Biological Anthropology**ANTH 843 Dental Anthropology****Crosslisted with:** ANTH 443**Description:** Cranio-facial anatomy, development and morphology as well as forensic uses of dentition.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 844 Human Osteology****Crosslisted with:** ANTH 344**Description:** Study of human osteology including histology, pathology, biomechanics and taphonomy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 848 Human Growth and Development****Crosslisted with:** ANTH 448, BIOS 448, BIOS 848**Prerequisites:** ANTH 242 and 242L, or BIOS 101 and 101L.**Description:** Biological diversity from an evolutionary perspective. The history of the study of human physical growth and biological principles of growth. Genetic, epigenetic and hormonal effects on human and other mammal growth patterns, and environmental factors that influence growth. Effects of nutrition, disease, socio-economic status, pollution, etc. Unique features of human growth in its various stages. How anthropologists interpret variation in growth patterns among human populations and the possible adaptive significance of this variation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Biological Anthropology**ANTH 851 Contemporary Issues of Indigenous Peoples in North America****Crosslisted with:** ANTH 451, ETHN 451**Prerequisites:** ANTH 351 or 352.**Description:** Political, economic, and social issues concerning indigenous peoples in North America.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology

ANTH 854 Ethnographic Field School**Crosslisted with:** ANTH 454**Prerequisites:** Permission of instructor.

Description: Advanced comparative study of the contemporary populations in a selected area of North America (occasionally outside of the USA) that may combine the traditional survey of ethnographic literature with personal observation, participation, and experiential learning activities in rural, urban, or traditional settings. The ethnographic focus (e.g., Native Americans, recent immigrants to the USA, historic practices) changes depending on research opportunities.

Credit Hours: 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**Groups:** Cultural Anthropology**ANTH 861 Geospatial Approaches in Digital Humanities and Social Sciences****Crosslisted with:** ANTH 461, CLAS 461, CLAS 861, GEOG 461, GEOG 861, HIST 461, HIST 861

Description: Study of geographic concepts and critical analysis of applications of Geographic Information Systems (GIS) in humanities and social sciences and application of geospatial tools for humanities and social science research; learn how to collect, manage, analyze, and visualize spatial data for real-world projects

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**ANTH 867 Gender and Material Culture****Crosslisted with:** TMFD 477, TMFD 877, WMNS 477, WMNS 877, ANTH 467

Prerequisites: Junior Standing; 3 hours in any of the following areas: ANTH, SOCI, HIST, AHIS, TMFD or WMNS.

Description: In depth analysis of the relationship between material culture and gender roles, categories, and performances. Engages with theoretical frameworks for material culture and gender, as well as topics such as the body, clothing, the built environment, technology and media.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 871 Digital Humanities Practicum****Crosslisted with:** ENGL 472, ENGL 872, HIST 472, HIST 872, ANTH 471, MODL 472, MODL 872**Prerequisites:** Junior standing.

Description: Provide students with real, in-depth experience in collaboratively creating digital humanities projects. Guided by faculty with expertise in a broad range of digital humanities methods and resources, students work in teams to tackle challenges proposed by UNL researchers and/or local and regional humanities organizations.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Digital Humanities**ANTH 872 Belief Systems: Animism to Zombies****Crosslisted with:** ANTH 472

Description: Explores the diversity of beliefs and rituals surrounding the mysteries of birth, life, death and beyond.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 873 Ecological Anthropology****Crosslisted with:** ANTH 473, NRES 873

Description: Human adaptive systems and their ecological contexts. The dynamic inter-relationships between subsistence, technology, social behavior, human demography, and ecological variability.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 874 Applied and Development Anthropology****Crosslisted with:** ANTH 474**Prerequisites:** ANTH 212

Description: Efforts by anthropologists and other trained specialists to influence the process of development and socioeconomic change in the modern world.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 875 Artisan Technologies Past and Present****Crosslisted with:** ANTH 475**Prerequisites:** 9 hrs ANTH.

Description: Study of selected technologies from around the world at the pre-industrial level of production. Examine hand made art and utilitarian artifacts with the goal of understanding them through replication. Analyze technology within its cultural setting.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 876 Human Rights, Environment, and Development****Crosslisted with:** ANTH 476**Prerequisites:** ANTH 212

Description: Human rights from an anthropological perspective. International human rights, development, and the environment; Western and non-Western perspectives on human rights; individual rights and collective (group) rights; social, economic, and cultural rights; women's rights; gay rights; indigenous peoples and minority groups' rights; and planetary (environmental) rights. Rights to food, culture, development, and a healthy ecosystem.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology

ANTH 877 Hunters-Gatherers**Crosslisted with:** ANTH 477**Prerequisites:** 9 hrs ANTH including ANTH 212.**Description:** Survey of hunter-gatherer society and its ecological and social adaptations. Hunters-gatherers and their important role in human history and evolution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**ANTH 878 Pro-seminar in Latin American Studies****Crosslisted with:** ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, GEOG 878, HIST 878, POLS 878, SOCI 878, MODL 878, EDPS 878**Prerequisites:** Junior standing and permission.**Notes:** Topical seminar required for all Latin American Studies majors.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Integrative Courses, Research Regional Geography Lat Am, Asian, Middle East Hist International Relations & Compar**ANTH 879 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, ANTH 479, ECON 866, GEOG 448, GEOG 848, HIST 479, HIST 879, SOCI 466, SOCI 866**Prerequisites:** Senior standing and permission.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations & Compar Variable group based on topic**ANTH 881 Landscape Archaeology****Crosslisted with:** ANTH 481**Description:** Survey of theory, method, and practice in describing and interpreting archaeological landscapes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LAB**ANTH 882 Field Methods in Ethnography****Crosslisted with:** ANTH 482**Prerequisites:** Anth 212.**Description:** Introduction to practical and theoretical issues involved in designing and undertaking qualitative field research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research**ANTH 883 Material Culture Research Methods****Crosslisted with:** TMFD 876**Prerequisites:** TMFD 830; TMFD 807 or 808; or permission.**Description:** Research methods for material culture study applied to textiles and dress. Methodologies for artifact study and skills. Fiber microscopy as a tool for artifact analysis. Conceptual development, application and evaluation of a model for artifact study.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ANTH 884 Quantitative Methods in Anthropology****Crosslisted with:** ANTH 484**Prerequisites:** 9 hrs ANTH; STAT 218 or equivalent.**Description:** Collection, management, and analysis of quantitative anthropological data. Methods of exploratory and confirmatory data analysis. Computer-assisted analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Laboratory and Field Training**ANTH 885 Pro-seminar in Anthropology****Crosslisted with:** ANTH 485**Prerequisites:** Permission.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research**ANTH 886 Digital Heritage****Description:** Exploration and deep evaluation of concept of heritage, digital heritage applications, and hands-on experience in creating digital heritage products using desktop and mobile devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LAB**ANTH 887 Analysis of Archaeological Materials****Crosslisted with:** ANTH 487**Prerequisites:** ANTH 232**Notes:** May be repeated. Topics vary by semester.**Description:** Survey of vocabulary, techniques, and ideas needed to research major materials found in archaeological sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**Groups:** Archaeology**ANTH 887A Analysis of Archaeological Materials - Ceramics****Crosslisted with:** ANTH 487A**Notes:** May be repeated. Topics vary by semester.**Description:** Survey of vocabulary, techniques, and ideas needed to research major materials found in archaeological sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC

ANTH 887B Analysis of Archaeological Materials - Lithics**Crosslisted with:** ANTH 487B**Notes:** May be repeated. Topics vary by semester.**Description:** Survey of vocabulary, techniques, and ideas needed to research major materials found in archaeological sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**ANTH 887D Analysis of Archaeological Materials - Archaeofauna****Crosslisted with:** ANTH 487D**Notes:** May be repeated. Topics vary by semester.**Description:** Survey of vocabulary, techniques, and ideas needed to research major materials found in archaeological sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**ANTH 887E Analysis of Archaeological Materials - Historic Material Culture****Crosslisted with:** ANTH 487E**Notes:** May be repeated. Topics vary by semester.**Description:** Survey of vocabulary, techniques, and ideas needed to research major materials found in archaeological sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**ANTH 888 Contentious Issues in Anthropology****Crosslisted with:** ANTH 488**Prerequisites:** 9 hrs of anthropology beyond ANTH 110.**Description:** Recent controversial issues through the integration of biological, cultural, and archaeological branches of anthropology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research**ANTH 889 GIS in Archaeology****Description:** Introduction to Geographic Information Systems (GIS) in archaeology and anthropology; lecture provides fundamental spatial concepts and a computer lab teaches skills on data acquisition, data integration, spatial analysis, and digital cartography.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 890 Advanced Field Work****Crosslisted with:** ANTH 490**Prerequisites:** ANTH 290 or equivalent.**Description:** Further practical experience in field research.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** FLD**Groups:** Laboratory and Field Training**ANTH 891 Advanced Laboratory Work****Crosslisted with:** ANTH 491**Prerequisites:** Permission.**Notes:** Only 3 credit hours will count toward the major in ANTH. Open only to advanced students wishing to complete a research project they have developed with ANTH faculty guidance.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LAB**Groups:** Laboratory and Field Training**ANTH 891A Special Topics****Crosslisted with:** JOMC 491, JOMC 891, ANTH 491A**Notes:** 12 hours max special topics hours at all levels (100, 200, 300, 400) per degree. May be repeated up to three times so long as the topics are different.**Description:** Topics vary each term.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**ANTH 894 Internship in Professional Archaeology****Prerequisites:** 9 hrs ANTH**Description:** Structured professional experience in archaeological research, administration, or curation outside the traditional academic setting.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**ANTH 895 Internship in Anthropology****Crosslisted with:** ANTH 495**Prerequisites:** Sophomore standing; and permission.**Description:** A structured professional experience outside the traditional academic setting designed to allow students to learn and use anthropological skills and knowledge and to develop professional networks.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**Groups:** Integrative Courses, Research**ANTH 896 Special Readings in Anthropology****Crosslisted with:** ANTH 496**Prerequisites:** Permission.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Groups:** Integrative Courses, Research

ANTH 898 Advanced Current Topics in Anthropology**Crosslisted with:** ANTH 498**Prerequisites:** Permission.**Description:** Seminar on current issues and problems in anthropology.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**Groups:** Integrative Courses, Research**ANTH 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ANTH 915 Seminar in Ethnology****Description:** Intensive study of theory and method in ethnology, with special attention to current research literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 921D Seminar in Literacy Studies: Language, Culture, and Education****Crosslisted with:** TEAC 921D**Description:** Research in literacy and schooling.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**ANTH 930A Ethnographic Methods****Crosslisted with:** CYAF 930A, EDPS 930A, NUTR 930A, TEAC 930A**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 935 Seminar in Archaeology****Description:** Theory and method in prehistory and historic archaeology. Current research literature in the field.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 945 Seminar in Physical Anthropology****Description:** Intensive study of theory and method in physical anthropology, with special attention to current research literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 946 Interdisciplinary Readings in Digital Humanities****Crosslisted with:** MODL 946, HIST 946, ENGL 946**Description:** Methods, theories, and practices of digital humanities scholarship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ANTH 994 Seminar in Anthropology and Geography****Crosslisted with:** GEOG 994**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**ANTH 996 Research Other Than Thesis****Description:** Research or reading in selected problems in anthropology, including the preparation of research for publication.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND

Architectural Engineering (AREN)

AREN 800 AE Graduate Seminar**Prerequisites:** Co-requisites: AREN 425 (AE 4250) or AREN 415 (AE 4150) or CIVE 334**Description:** Literature Review, reading and evaluation of technical publications concerned with theory and/or experimental data in various areas of Architectural Engineering, attendance at Architectural Engineering Graduate Project and Team Design presentations, preparation of the Master of Architectural Engineering graduate project proposal, assignments related to improving written and oral communication skills.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AREN 801 Graduate Design Project I****Prerequisites:** (UNO) AE 4010 or AE 4020; or (UNO) CIVE 3140; and permission**Notes:** Students are permitted to enroll in this course twice. Those who fail to earn a passing grade after enrolling in this course a second time will be referred to the AE Graduate Committee, and this may result in termination of their program of graduate studies. AREN 801/(UNO) AE 8010 requires a professionally-written report and oral presentation that demonstrates both mastery of the subject and a high level of writing and oral communication skills.**Description:** Perform a detailed investigation in the Option Area of the master of architectural engineering degree.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**Prerequisite for:** AREN 802

AREN 802 Graduate Design Project II**Prerequisites:** AREN 801 (AE 8010); and permission**Description:** Second of a two-course capstone design project for the MAE degree. AREN 802 (AE 8020) requires a professionally-written report and oral presentation that demonstrates both mastery of the subject and a high level of writing and oral communication skills.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**AREN 803 Interdisciplinary Team Design Project****Prerequisites:** For Acoustics and/or Mechanical option: AREN 415 (AE 4150) and AREN 430 (AE 4300). For Electrical and/or Lighting option: AREN 425 (AE 4250) and AREN 822 (AE 8220). For Structural option: CIVE 444**Notes:** This course is the 1st semester of the capstone design sequence in architectural engineering.**Description:** Develop and design the electrical, lighting, mechanical, and structural systems for a building, from programming through design development phase, as an interdisciplinary team effort.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** AREN 804**AREN 804 Interdisciplinary Team Design Project II****Prerequisites:** AREN 803**Notes:** This course is intended to be taken the semester following AREN 803. AREN 804 is the 2nd semester of the capstone design sequence in architectural engineering.**Description:** Develop and design the electrical, lighting, mechanical, and structural systems for a building, from the design development phase through construction documents, as an interdisciplinary team effort.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**AREN 805 Internship in Architectural Engineering****Description:** This course requires participation in a full time summer internship associated with an Architectural Engineering related entity. The course includes weekly assignments and a final presentation designed to create interaction between the AE entity and the intern associated with the business side of the entity. General Topics include Business Plans, Marketing, Finance and Budgets, Contracts, Legal issues and professionalism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**AREN 806 Architectural Engineering Professional Practice I****Prerequisites:** ISMG 2060**Description:** Investigation of issues related to the integration of building design processes with professional architectural engineering practice. Aspects of building design project finance, budgets, contracts, legal issues, professional licensure, professional responsibility and professional ethics. The perspective of life-cycle costing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 807**AREN 807 Architectural Engineering Professional Practice II****Prerequisites:** IMSE 206/(UNO) IMSE 2060; and AREN 806/(UNO) AE 8060**Notes:** Continuation of investigation of issues related to the integration of building design processes with professional architectural engineering design practice.**Description:** Building design specifications, estimating, bidding, building construction contract negotiations, building design project management, project team personnel management, project risk, and key regulatory measures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 808 Applied Experimental Design and Statistical Analysis****Prerequisites:** STAT 380/(UNO) 3800**Description:** Overview of advanced experimental design methods and statistical analysis techniques. Application of these to the planning, execution, analysis, and description of research in architectural engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 809 Sustainable Building Design****Prerequisites:** CIVE 341 or ARCH 332; AREN 310 (AE 3100) or AREN 841 or ARCH 333**Description:** Integrates building design with the principles of minimum resource use, energy conservation and healthy indoor environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 810 Solar Energy Systems****Prerequisites:** MECH 820 or permission**Description:** Fundamentals of solar energy system modeling analysis and design. Solar radiation modeling, surface properties of opaque and glazing materials, flat-plate collector design, solar energy storage, solar system thermal calculation, system application and design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AREN 811 Indoor Air Quality Engineering**Prerequisites:** AREN 310.**Description:** Indoor air quality. Codes, standards, HVAC equipment, commissioning, operation, maintenance, investigation, and remediation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 818; AREN 918**AREN 812 Building Control and Automation Systems****Prerequisites:** MATH 3350 ; AE 3100, AE 4120, AE 4120**Description:** Fundamental concepts of building control theory and automation. Building control: state-variable plant and closed-loop system representation, time and frequency response, stability, root-locus methods and design of building control systems. Automation: thermostats, dampers, valves, direct digital control, control of air handling units, terminal units, primary building systems, supervisory control and system optimization, communication systems, BACnet, and DDC system design and implementation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 913; AREN 915; AREN 916; AREN 917**AREN 814 Building Energy III: Advanced Building Energy System Modeling****Prerequisites:** MECH 300/(UNO) ENG 3000, AREN 310/(UNO) AE 3100, AREN 412/(UNO) AE 4120, MECH 420/(UNO) MENG 4200; or permission.**Description:** Advanced Analysis, Modeling, Diagnostics and Optimization of Building Energy Systems. Be familiar with Engineering Equation Solver (EES) Programming; Be able to build models for Air Handling Unit Systems and Vapor Compression Cycle Equipment; Be able to analyze building operating efficiency and identify faulty operating conditions; Be able to conduct retrofit energy efficiency analysis and feasibility study.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 917**AREN 815 Building Energy Simulation and Performance Contracting****Prerequisites:** AE 3100, AE 4120, AE 4140, and AE 4400 (UNO)**Description:** Integrated approach to deliver energy improvement retrofit projects that provide economical and ecological benefits. Proficiency in EnergyPlus or DOE-2 and in retrofit cost estimation will be attained and integrated into an engineering economic analysis. Partnering configurations, contracts, financing, and measurement and verification. Concepts applied to a practical class project.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 817 Theory and Application of Thermal Systems Measurement****Prerequisites:** STAT 8805 or equivalent**Description:** Analysis, theory, and methods of instrumentation for thermal system energy consumption measurement and scientific research testing. Emphasis on sensors, transducers, and error analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 818 Indoor Air Quality Design****Prerequisites:** AREN 811 or permission**Description:** Fundamentals of project management within the mechanical and electrical contracting industry. Emphasis on codes, contract documents, productivity, coordination, project control and administration, scheduling, safety, and project closeout, all from a speciality contracting perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 820 Lighting II: Theory, Design and Application****Crosslisted with:** AREN 420**Prerequisites:** (UNO) AE 3200**Notes:** Lab sessions include photometric measurements and computer applications.**Description:** Design and analysis of lighting systems; the integration between the lighting design process and the technical foundations for building lighting; design criteria; lighting design procedures lighting modes and subjective effects; and calculation tools.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 425; AREN 825; AREN 920**AREN 821 Lighting II: Advanced Design Practice****Prerequisites:** AREN 820**Description:** Design and analysis of lighting for outdoor sports, floodlighting and interior applications; economic analysis; modeling algorithms; advanced photometrics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 822 Electrical Systems for Buildings II****Prerequisites:** AE 3220**Description:** Power systems analysis and design, integration of electrical system components into functional, safe and reliable power distribution systems for commercial and industrial facilities. Per unit analysis, fault analysis, power quality, grounding, overcurrent protection coordination and complete power system design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 823 Light Sources****Prerequisites:** AREN 820**Description:** Fundamental science and principles of light generation in modern electric light sources; characteristics that influence applications of light sources.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AREN 824 Lighting Metrics**Prerequisites:** AE 3200 or equivalent**Description:** Critical survey and application of measures developed to characterize the effects of lighting systems on human perception and performance. Contrast, visibility, visual performance (Relative Visual Performance, Visibility Level); visual comfort probability; discomfort glare rating system; and unified glare rating system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 825 DAYLIGHTING****Prerequisites:** AREN 820**Description:** Use of natural light in building design. Solar position, sky luminance, distribution models, daylighting equipment, calculation methods, and psychological concepts. Extensive use of computer modeling and scale models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 826 Building Communication Systems****Prerequisites:** AREN 322 (AE 3220)**Description:** Integration of voice, data and video systems into overall building design. Scalability; wireless systems; interference; project management; current industry standards and protocols.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 830 ADV NOISE CONTROL****Crosslisted with:** AREN 430**Prerequisites:** AE 3300 or equivalent**Description:** Characterization of acoustic sources; use and measurement of sound power and intensity; sound-structure interaction; acoustic enclosures and barriers; muffling devices; vibration control; and active noise control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 833 ADV ARCH ACOUSTICS****Prerequisites:** AE 3300 or equivalent**Description:** Advanced study of the behavior of sound in rooms. Design of acoustical spaces; physical and computational modeling; measurement techniques; and introduction to sound reinforcement in rooms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 930**AREN 835 ELECTROACOUSTICS****Prerequisites:** AE 3300 or equivalent**Description:** Electrical-mechanical-acoustical circuit analogies; transducers, loudspeakers, microphones, and accelerometers; directivity; calibration techniques; and sound reinforcement systems in rooms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 841 BLDG ENERGY&ACOUSTIC****Prerequisites:** Admission to MEng program or permission**Description:** Building energy and acoustical systems: energy systems, including psychometric processes and applications; load calculations; distribution systems; acoustic fundamentals; room acoustics; and noise control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 851 Masonry and Timber Design****Prerequisites:** CIVE 440 (Reinforced Concrete Design) or equivalent; CIVE 441 (Steel Design) or equivalent.**Description:** Masonry as a structural material, Unreinforced Masonry Design, Reinforced Masonry Design, State-of-the-art Assessment methods for Existing Masonry Structures, Timber as a structural material, Timber Design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 880 Graduate Seminar in Architectural Engineering and Construction****Description:** The objectives of this course are to broaden student knowledge on engineering topics, improve presentation and professional skills, as well as learn about professional development resources available on campus. To pass the course, a student must attend a minimum of 15 Durham School Graduate Student Seminars, MAE project presentations, and/or MS/PhD thesis presentations in the College of Engineering. The student must also present one seminar within the Durham School Graduate Student Seminar series, prior to the final oral examination. All MS and PhD graduate students in architectural engineering must enroll within their first 3 semesters of matriculation.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** IND**AREN 892 Individual Instruction in Architectural Engineering****Prerequisites:** Permission**Description:** Individual instruction in Architectural Engineering at the graduate level in a selected area, under the supervision and guidance of an Architectural Engineering faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**AREN 894 SPECIAL TOPICS****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**AREN 899 MASTERS THESIS****Prerequisites:** Admission to AREN/AE (UNO) masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND

AREN 913 DYNAMIC PROGRAMMING**Prerequisites:** AE 3100, AE 4120, AE 4140 ; AREN 812**Description:** Concepts and implementation of dynamic programming for building optimal and adaptive control. Deterministic shortest-path applications and continuous-time optimal control, inventory control, perfect and imperfect state information, suboptimal and adaptive control, discounted infinite horizon and stochastic shortest-path problems including Q-Learning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 915 MOD BLDG CONTROL APP****Prerequisites:** AE 3100, AE 4120, AE 4140 ; AREN 812**Description:** Neuro-dynamic programming/reinforcement learning methodology, fuzzy logic methods, and evolutionary/genetic algorithms (GA) to building control problems. Concepts applied to case studies from problem areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 916 BLDG ENRGY SYS MDLNG****Prerequisites:** AE 420 and AREN 812; or permission**Description:** Modeling, control, and optimization of the secondary building energy systems: building envelope, room comfort zones, air handling units, cooling and heating water loops.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 917 PRIMARY ENERGY SYS****Prerequisites:** AREN 812, AREN 814 or permission**Description:** Modeling, control, and optimization of the primary building energy systems: central distribution systems, chiller systems, boiler systems, central cooling plants, central heating plants, and thermal storage systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 918 FLUID DYNAMC MODELNG****Prerequisites:** AREN 811, MECH 810, or permission**Description:** Application of computational fluid dynamics software to modeling of indoor environments. Turbulence modeling, boundary conditions, natural and forced convection flows, species transport, and fire modeling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 920 COLOR THEORY****Prerequisites:** AREN 820**Description:** Theories of color vision; theoretical and mathematical basis for chromaticity, color temperature, color rendering metrics, color matching functions, and color spaces; spectral weighing functions; and measurement of color.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 921 RSH: ILLUMINATN THRY****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 922 BEHVRL SCI LIGHT RSH****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 923 PSYCH OF LIGHTING****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 930 TOPC: ARCH ACOUSTICS****Prerequisites:** AREN 833**Description:** Current topics in architectural acoustics. Objective versus subjective measures in performance spaces, electronic enhancement of rooms, advanced computational modeling techniques, and auralization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AREN 997 RSH OTHER THAN THESI****Prerequisites:** Permission**Description:** Supervised non-thesis research and independent study.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**AREN 998 SPECIAL TOPICS****Prerequisites:** Permission**Description:** Advanced topics in architectural engineering.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 1**Format:** LEC**AREN 999 DOCTORAL DISSERTATN****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Architecture (ARCH)

Professional Courses

ARCH 500 Architecture Core Studio I: Project

Crosslisted with: ARCH 800

Prerequisites: Admission into the 3 Year Master of Architecture program or permission.

Description: Introduction to architectural design through spatial and formal projects using representational techniques. A series of collaborative and individual projects introduce design process, iteration, tectonics, representation, and structure as fundamental aspects of design that relate architecture to the human subject.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: SDO

Prerequisite for: ARCH 501, ARCH 801

ARCH 501 Architecture Core Studio II: Incorporate

Crosslisted with: ARCH 801

Prerequisites: ARCH 500

Description: The studio extends the methodologies from the preceding studio to include outside influences such as site, urbanism, program, culture, and materiality. Projects increase in scope and complexity and integrate a wide range of inputs through research and analysis.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: SDO

ARCH 510 Advanced Architectural Design I

Crosslisted with: ARCH 810

Prerequisites: Admission into the Master of Architecture program.

Description: Vertically integrated 5th and 6th year studio.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: SDO

Offered: FALL

Prerequisite for: ARCH 613, ARCH 913

ARCH 511 Advanced Architectural Design II

Crosslisted with: ARCH 811

Prerequisites: Admission into the Master of Architecture program.

Description: Vertically integrated 5th and 6th year studio.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: SDO

Offered: FALL

ARCH 518 Fabrication and Construction Team

Crosslisted with: ARCH 418, ARCH 818

Prerequisites: Permission.

Description: The shifting relationship between conceiving and making through hands-on, collaborative experience with actual design-construct projects in which students play a decisive role in all aspects of research, design and construction of the commission.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

ARCH 526 Digital Fabrication

Crosslisted with: ARCH 826

Prerequisites: Permission.

Description: Examination of the theory and application of the file-to-factory design process. Exploratory case study projects include small fabricated architectural models of forms, surface and structure.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ARCH 527 Parametric Modeling for Design

Prerequisites: ARCH 527

Description: Introduction to parametric and related basic computational concepts for design. Explorations in specific parametric modeling software techniques.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

ARCH 532A Seismic Design for Architects

Crosslisted with: ARCH 832A

Prerequisites: Permission.

Description: Introduction to basic seismic design principles. Making critical decisions concerning the overall performance of a building during an earthquake.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

ARCH 540 Details

Crosslisted with: ARCH 440, ARCH 840

Prerequisites: ARCH 341 or permission.

Description: Focused study of architectural theory and problems of practice and physicality examined in the context of the architectural detail.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ARCH 543 Architectural Representations: Theory + Application

Crosslisted with: ARCH 443, ARCH 843

Prerequisites: ARCH 311 or by Permission.

Description: Explores architectural practice relative to representational communication both internally within the design process as well as with an external audience. This course also investigates the impact of tangential techniques appropriated to the practice. Readings, discussions, and projects will focus on issues of perception and projection relative to these systems and how they impact the practice of architecture in a contemporary context. Course structure is both a theory seminar addressing the position of representation through readings, as well as a laboratory for investigating their application.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ARCH 547 African Architecture**Crosslisted with:** ARCH 347, AHIS 366, ETHN 347**Prerequisites:** Sophomore standing.**Description:** Survey of the architectural traditions of the African continent, from pre-historic times to the present day. Buildings-famous and typical-theories, and approaches that are appropriate to the specific cultural environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 558 The Changing Workplace****Crosslisted with:** ARCH 458, ARCH 858, IDES 458, IDES 858**Description:** Survey and integration of theory, methods, research and findings from the social, behavioral, and managerial sciences as they relate to the design of work environments. Factors effecting change in the contemporary workplace.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 561 Urbanism****Crosslisted with:** ARCH 461, LARC 461, ARCH 861**Prerequisites:** Admission to a professional program in the College of Architecture or permission**Notes:** Letter grade only.**Description:** Issues of contemporary urbanism and the processes of urban design. Experiential nature of cities, role of public policy, ideology, genesis and development of urban form and space.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 562 Urbanism and the Catalysts of Change****Crosslisted with:** ARCH 862**Prerequisites:** Admission into the graduate portion of the professional program in architecture or permission**Description:** Exploration into the relationship between the evolution of urbanism and the cultural, economic and scientific advances made by civilization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 563 Project Territory****Crosslisted with:** ARCH 863**Prerequisites:** Admission into the graduate portion of the professional program in architecture**Description:** Comprehensive review and examination of territorial relationships between spatial development, engineering, ecology, and architecture. Focuses on emerging factors affecting urban, suburban, and rural communities and spatial configurations beyond the binary of city and country.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 565 Configurational Formations****Crosslisted with:** ARCH 865**Prerequisites:** Admissions to the professional architecture program, or permission.**Description:** Investigation of evolutions in typological reasoning leading up to and including contemporary configurational theory. Use of graphic modeling to research, dissect, compare and discuss select topics and case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ARCH 566 Community Design Center****Crosslisted with:** ARCH 466, ARCH 866**Prerequisites:** Permission.**Description:** Community-oriented design studio. The design process and its relationship to the environmental development process.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**ARCH 567 Planting Design****Crosslisted with:** ARCH 467, ARCH 867, LARC 467, HORT 467**Prerequisites:** HORT/LARC/NRES 212; ARCH 210 or HORT/LARC 266.**Description:** Design processes, principles, and elements as applied to the use of native and ornamental plant materials. Aesthetic, functional, and micro-climatic arrangements of plant material in parks, on commercial property, on home grounds, along roadways, and in urban open spaces. Develop a palette of plants and graphics for designs.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ARCH 581 Women in Design****Crosslisted with:** ARCH 481, ARCH 881, IDES 481**Prerequisites:** Admission to the BSD program.**Description:** Intensive study of particular historical and contemporary contributions by women to the design professions related to the built environment. Evaluation of design work by and about women seen in their aesthetic and intellectual context. Examinations of the roles and values of women in design and their impact on the assumptions and issues currently held by the profession.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 582 Advanced Color Theory****Crosslisted with:** ARCH 482, ARCH 882, IDES 482, IDES 882**Prerequisites:** Admission to the third year in architecture or Interior Design Program.**Description:** Advanced color theories and their application to the Built environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ARCH 589 Design Research**Crosslisted with:** ARCH 489, ARCH 889, IDES 489, IDES 889, LARC 489**Prerequisites:** Admission to a professional program in the College of Architecture**Description:** Comprehensive overview of the complementary and contributory relationship between research and design, with a particular emphasis on design research as a projective activity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ARCH 597 Selected Topics in Architecture****Crosslisted with:** ARCH 497, ARCH 497H, ARCH 697, ARCH 897**Prerequisites:** Permission.**Description:** Group investigation of a topic in architecture originated by the instructor.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC**ARCH 598 Problems in Architecture****Crosslisted with:** ARCH 498, ARCH 498H, ARCH 898**Prerequisites:** Permission.**Description:** Individual investigation of a topic in architecture.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND**ARCH 610 Advanced Architectural Design III****Crosslisted with:** ARCH 910**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** FALL**ARCH 611 Advanced Architectural Design IV****Crosslisted with:** ARCH 911**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** SPRING**ARCH 613 Architectural Design: Terminal Project Studio I****Crosslisted with:** ARCH 913**Prerequisites:** ARCH 510/810, submission of a statement of intent and a contract with a faculty mentor**Description:** Advanced architectural design. The first part of a year-long design project initiated by the student and developed in conjunction with a faculty mentor. The first course in the sequence consists of initial studies that are further developed and completed in the following semester. These initial studies lead to a written and visual proposal that sets the parameters and the agenda for detailed formal design explorations in the following semester.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** ARCH 614, ARCH 914**ARCH 614 Architectural Design: Terminal Project Studio II****Crosslisted with:** ARCH 914**Prerequisites:** ARCH 613/913**Description:** Advanced architectural design. The second part of a year-long design project initiated by the student under the supervision and guidance of a faculty mentor. The second course in the sequence develops the formal expression and representation of a specific architectural project as described in the previous semester's work.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**ARCH 617 Product Design****Crosslisted with:** ARCH 417, ARCH 817, IDES 417**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Practical investigation in the use of materials and their fabrication process with emphasis on wood, plastic, and steel. Generate a design from conception to a finished product.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 680 Professional Practice****Crosslisted with:** ARCH 880**Description:** Orientation to professional practice through a study of the architects' and the contractors' relationships to society, specific clients, their professions, and other collaborators in the environmental design and construction fields. Ethics; professional communication and responsibility; professional organizations; office management; construction management; legal and contractual relationships; professional registration; and owner-architect-contractor relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ARCH 691 Seminar in Architecture**Crosslisted with:** ARCH 991**Prerequisites:** ARCH 550/850 and permission**Description:** Contemporary problems in design and practice.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 695 Internship****Crosslisted with:** ARCH 895**Prerequisites:** ARCH 550/850 and permission**Description:** Exposure to the architectural profession through office application including job promotion, client relations, data collection, design, production drawings, estimating, specifications, bid documents, and quality control.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**ARCH 697 Selected Topics in Architecture****Crosslisted with:** ARCH 497, ARCH 497H, ARCH 597, ARCH 897**Prerequisites:** Permission.**Description:** Group investigation of a topic in architecture originated by the instructor.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC**ARCH 699 Masters Thesis****Crosslisted with:** ARCH 899**Prerequisites:** ARCH 896; any two of ARCH 511/911, 612/812, or 613/913; admission to masters degree program and permission of major adviser**Description:** Projects to place special emphasis upon a major field of interest. Design problem or written thesis.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND

Graduate Courses

ARCH 800 Architecture Core Studio I: Project**Crosslisted with:** ARCH 500**Prerequisites:** Admission into the 3 Year Master of Architecture program or permission.**Description:** Introduction to architectural design through spatial and formal projects using representational techniques. A series of collaborative and individual projects introduce design process, iteration, tectonics, representation, and structure as fundamental aspects of design that relate architecture to the human subject.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Prerequisite for:** ARCH 501, ARCH 801**ARCH 801 Architecture Core Studio II: Incorporate****Crosslisted with:** ARCH 501**Prerequisites:** ARCH 800**Description:** The studio extends the methodologies from the preceding studio to include outside influences such as site, urbanism, program, culture, and materiality. Projects increase in scope and complexity and integrate a wide range of inputs through research and analysis.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**ARCH 810 Advanced Architectural Design I****Crosslisted with:** ARCH 510**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** FALL**Prerequisite for:** ARCH 613, ARCH 913**ARCH 811 Advanced Architectural Design II****Crosslisted with:** ARCH 511**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** FALL**ARCH 815 Architectural Design: Terminal Project Studio I****Prerequisites:** MArch/MCRP dual degree candidate. Coreq: CRPL 990.**Notes:** Submission of a statement of intent and a contract with an architecture faculty mentor is required.**Description:** Advanced architectural design. Initial investigation into the parameters and agenda leading to a proposal for the terminal studio project.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**ARCH 816 Architectural Design: Terminal Project Studio II****Prerequisites:** Permission.**Description:** Detailed formal design development of the terminal studio project established in ARCH 815 and CRPL 990.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**ARCH 817 Product Design****Crosslisted with:** ARCH 417, ARCH 617, IDES 417**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Practical investigation in the use of materials and their fabrication process with emphasis on wood, plastic, and steel. Generate a design from conception to a finished product.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ARCH 818 Fabrication and Construction Team**Crosslisted with:** ARCH 418, ARCH 518**Prerequisites:** Permission.**Description:** The shifting relationship between conceiving and making through hands-on, collaborative experience with actual design-construct projects in which students play a decisive role in all aspects of research, design and construction of the commission.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**ARCH 826 Digital Fabrication****Crosslisted with:** ARCH 526**Prerequisites:** Permission.**Description:** Examination of the theory and application of the file-to-factory design process. Exploratory case study projects include small fabricated architectural models of forms, surface and structure.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 832A Seismic Design for Architects****Crosslisted with:** ARCH 532A**Prerequisites:** Permission**Description:** Introduction to basic seismic design principles. Making critical decisions concerning the overall performance of a building during an earthquake.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ARCH 840 Details****Crosslisted with:** ARCH 440, ARCH 540**Prerequisites:** ARCH 341 or permission.**Description:** Focused study of architectural theory and problems of practice and physicality examined in the context of the architectural detail.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 843 Architectural Representations: Theory + Application****Crosslisted with:** ARCH 443, ARCH 543**Prerequisites:** ARCH 311 or by Permission.**Description:** Explores architectural practice relative to representational communication both internally within the design process as well as with an external audience. This course also investigates the impact of tangential techniques appropriated to the practice. Readings, discussions, and projects will focus on issues of perception and projection relative to these systems and how they impact the practice of architecture in a contemporary context. Course structure is both a theory seminar addressing the position of representation through readings, as well as a laboratory for investigating their application.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 858 The Changing Workplace****Crosslisted with:** ARCH 458, ARCH 558, IDES 458, IDES 858**Description:** Survey and integration of theory, methods, research and findings from the social, behavioral, and managerial sciences as they relate to the design of work environments. Factors effecting change in the contemporary workplace.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 861 Urbanism****Crosslisted with:** ARCH 461, LARC 461, ARCH 561**Prerequisites:** Admission to a professional program in the College of Architecture or permission**Notes:** Letter grade only.**Description:** Issues of contemporary urbanism and the processes of urban design. Experiential nature of cities, role of public policy, ideology, genesis and development of urban form and space.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 862 Urbanism and the Catalysts of Change****Crosslisted with:** ARCH 562**Prerequisites:** Admission into the graduate portion of the professional program in architecture**Description:** Exploration into the relationship between the evolution of urbanism and the cultural, economic and scientific advances made by civilization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 863 Project Territory****Crosslisted with:** ARCH 563**Prerequisites:** Admission into the graduate portion of the professional program in architecture**Description:** Comprehensive review and examination of territorial relationships between spatial development, engineering, ecology, and architecture. Focuses on emerging factors affecting urban, suburban, and rural communities and spatial configurations beyond the binary of city and country.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 865 Configurational Formations****Crosslisted with:** ARCH 565**Prerequisites:** Admissions to the professional architecture program, or permission.**Description:** Investigation of evolutions in typological reasoning leading up to and including contemporary configurational theory. Use of graphic modeling to research, dissect, compare and discuss select topics and case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

ARCH 866 Community Design Center**Crosslisted with:** ARCH 466, ARCH 566**Prerequisites:** Permission.**Description:** Community-oriented design studio. The design process and its relationship to the environmental development process.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**ARCH 867 Planting Design****Crosslisted with:** ARCH 467, ARCH 567, LARC 467, HORT 467**Prerequisites:** HORT/LARC/NRES 212; ARCH 210 or HORT/LARC 266.**Description:** Design processes, principles, and elements as applied to the use of native and ornamental plant materials. Aesthetic, functional, and micro-climatic arrangements of plant material in parks, on commercial property, on home grounds, along roadways, and in urban open spaces. Develop a palette of plants and graphics for designs.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ARCH 880 Professional Practice****Crosslisted with:** ARCH 680**Description:** Orientation to professional practice through a study of the architects' and the contractors' relationships to society, specific clients, their professions, and other collaborators in the environmental design and construction fields. Ethics; professional communication and responsibility; professional organizations; office management; construction management; legal and contractual relationships; professional registration; and owner-architect-contractor relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 881 Women in Design****Crosslisted with:** ARCH 481, ARCH 581, IDES 481**Prerequisites:** Admission to the BSD program.**Description:** Intensive study of particular historical and contemporary contributions by women to the design professions related to the built environment. Evaluation of design work by and about women seen in their aesthetic and intellectual context. Examinations of the roles and values of women in design and their impact on the assumptions and issues currently held by the profession.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 882 Advanced Color Theory****Crosslisted with:** ARCH 482, ARCH 582, IDES 482, IDES 882**Prerequisites:** Admission to the third year in architecture or Interior Design Program.**Description:** Advanced color theories and their application to the Built environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 885 Research Methods in Architecture and Interior Design****Crosslisted with:** IDES 885**Description:** Research methods employed by the diverse specializations within the disciplines of architecture and interior design. Methods which contribute to a theoretical and informational body of knowledge as well as those contributing directly to design application.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ARCH 889 Design Research****Crosslisted with:** ARCH 489, ARCH 589, IDES 489, IDES 889, LARC 489**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Comprehensive overview of the complementary and contributory relationship between research and design, with a particular emphasis on design research as a projective activity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**ARCH 895 Internship****Crosslisted with:** ARCH 695**Prerequisites:** ARCH 550/850 and permission**Description:** Exposure to the architectural profession through office application including job promotion, client relations, data collection, design, production drawings, estimating, specifications, bid documents, and quality control.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**ARCH 897 Selected Topics in Architecture****Crosslisted with:** ARCH 497, ARCH 497H, ARCH 597, ARCH 697**Prerequisites:** Permission.**Description:** Group investigation of a topic in architecture originated by the instructor.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC**ARCH 898 Problems in Architecture****Crosslisted with:** ARCH 498, ARCH 498H, ARCH 598**Prerequisites:** Permission.**Description:** Individual investigation of a topic in architecture.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND

ARCH 899 Masters Thesis**Crosslisted with:** ARCH 699**Prerequisites:** ARCH 896; any two of ARCH 511/911, 612/812, or 613/913; admission to masters degree program and permission of major adviser**Description:** Projects to place special emphasis upon a major field of interest. Design problem or written thesis.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND**ARCH 910 Advanced Architectural Design III****Crosslisted with:** ARCH 610**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** FALL**ARCH 911 Advanced Architectural Design IV****Crosslisted with:** ARCH 611**Prerequisites:** Admission into the Master of Architecture program.**Description:** Vertically integrated 5th and 6th year studio.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Format:** SDO**Offered:** SPRING**ARCH 913 Architectural Design: Terminal Project Studio I****Crosslisted with:** ARCH 613**Prerequisites:** ARCH 510/810, submission of a statement of intent and a contract with a faculty mentor**Description:** Advanced architectural design. The first part of a year-long design project initiated by the student and developed in conjunction with a faculty mentor. The first course in the sequence consists of initial studies that are further developed and completed in the following semester. These initial studies lead to a written and visual proposal that sets the parameters and the agenda for detailed formal design explorations in the following semester.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** ARCH 614, ARCH 914**ARCH 914 Architectural Design: Terminal Project Studio II****Crosslisted with:** ARCH 614**Prerequisites:** ARCH 613/913**Description:** Advanced architectural design. The second part of a year-long design project initiated by the student under the supervision and guidance of a faculty mentor. The second course in the sequence develops the formal expression and representation of a specific architectural project as described in the previous semester's work.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**ARCH 991 Seminar in Architecture****Crosslisted with:** ARCH 691**Prerequisites:** ARCH 550/850 and permission**Description:** Contemporary problems in design and practice.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Art History and Criticism (AHIS)

AHIS 805 Curatorial Methods in an Art Museum**Prerequisites:** AHIS 905**Description:** Understanding through direct experience how the rhetoric of the art museum and art exhibition alters, frames and revises art historical arguments, issues, questions and research. In order to do so, each iteration of the seminar will select a particular art historical concept (e.g. ephemeral art; interactive art; gendered art; labor and(in) art; illness and art, and so on) and critically assess how curators can best express an argument about the history and meaning of art within the terms set by the museum. Those terms include both the ideological and practical: education, conservation, collections management, marketing development, publications, visitor evaluation and administration. Students will gain a sophisticated understanding of the methods available to curators for researching, organizing and expressing an art historical question in the form of an exhibition. The Sheldon Museum of Art serves as a lab for this course. Students will follow the path of an exhibition from original proposal to installation, considering the curator's involvement and interactions with all the departments of the museum.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 806 Visualizing the Ancient City****Crosslisted with:** AHIS 406, ANTH 406, ANTH 806, CLAS 406, CLAS 806**Prerequisites:** Junior standing.**Notes:** Recommend some background knowledge of ancient art, history, or languages, a general background course such as AHIS 101, ANTH 252, CLAS 209/CLAS 210, or any of the courses listed in the Archaeology or Digital Humanities minors. Computer/design skills welcome but not necessary.**Description:** A new approach to looking at the history and development of ancient cities, combining history and archaeology with digital methods, in particular 3D modeling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 811 Classical Architecture****Crosslisted with:** AHIS 411**Prerequisites:** 12 hrs in art history or related disciplines with permission.**Description:** History and development of architectural orders and styles from ancient Greece and Italy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AHIS 812 Greek Sculpture**Crosslisted with:** AHIS 412**Prerequisites:** 12 hrs in art history or related disciplines with permission.**Description:** Greek sculpture from the Bronze Age through the Hellenistic periods. Stylistic evolution and classical themes as presented in individual freestanding and architectural sculpture. Techniques, materials, and uses of sculpture.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 813 Roman Painting****Crosslisted with:** AHIS 413**Prerequisites:** 12 hrs in art history or related disciplines with permission.**Description:** Development of Roman painting from the Etruscans through the Age of Constantine.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 818 Gothic Painting and Prints****Crosslisted with:** AHIS 418**Prerequisites:** 12 hrs in art history, including AHIS 318, or in related disciplines with permission.**Description:** Style, iconography, history, and function of painting and prints from ca. 1150 to 1475 in France, Germany, and the Netherlands. Includes manuscript illumination, stained glass, panel painting, woodcuts, and engravings, stressing the development of naturalism before the "Renaissance" in Northern Europe.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 821 The Italian Renaissance City****Crosslisted with:** AHIS 421**Prerequisites:** 12 hrs in art history, or in related disciplines with permission.**Description:** Exploration of the art and architecture of the Italian city in the late middle ages and Renaissance, with particular attention to civic projects and the role of art in defining the identity, and creating the "myths" of that city.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 826 Northern Renaissance and Reformation Art****Crosslisted with:** AHIS 426**Prerequisites:** 12 hrs in art history, including AHIS 318 or 418, or in related disciplines with permission.**Description:** Art of the Renaissance and Reformation in Germany and the Netherlands. Stresses the influences of Italian Renaissance Art and the impact of the Protestant Reformation from ca. 1475 to 1575.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 831 Italian Baroque Art****Crosslisted with:** AHIS 431**Prerequisites:** 12 hrs in art history or in related disciplines with permission.**Description:** Painting, sculpture and architecture in Italy from the late sixteenth to the late seventeenth century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 841 Impressionism and Post-Impressionism****Crosslisted with:** AHIS 441**Prerequisites:** 12 hr in art history or in related disciplines with permission.**Description:** French Impressionism and Post-impressionism with consideration of the historical context out of which they emerged. Development of the avant-garde and the changing relationship of the artist to society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 846 Art since 1945****Crosslisted with:** AHIS 446**Prerequisites:** 12 hrs in art history, including AHIS 102 and 246.**Description:** Art from 1945 to the present focusing on the development of the avant-garde, the transition from modernism to post-modernism, and the various art world institutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AHIS 448, AHIS 848**AHIS 848 Post-Modernism****Crosslisted with:** AHIS 448**Prerequisites:** 12 hrs in art history, including AHIS 102 or 246, and AHIS 446/846; or 12 hrs in related disciplines with permission**Description:** Developments in art since 1970, exploring the various art styles and the relationship of the artists to their audience and to the institutions of the art world.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 851 19th-Century American Art****Crosslisted with:** AHIS 451**Prerequisites:** 12 hrs art history including AHIS 251 or 341 or permission.**Description:** 19th Century American art and material culture.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 852 American Art, 1893-1939****Crosslisted with:** AHIS 452**Prerequisites:** 12 hrs art history including AHIS 252 or 346 or permission.**Description:** Early 20th-century American art.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AHIS 856 Pre-Columbian Art**Crosslisted with:** AHIS 456**Prerequisites:** Permission**Description:** Emphasizing the Mesoamerican and Andean traditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 857 Colonial Art of Latin America****Crosslisted with:** AHIS 457**Prerequisites:** 12 hrs in the history of art or in related disciplines with permission.**Description:** Emphasizing New Spain, the Viceroyalty of Peru, and Brazil.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 871 History of Photography****Crosslisted with:** AHIS 471**Prerequisites:** Permission.**Description:** Introduction to the history of still photography with major emphasis on its development as an art form.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AHIS 472, AHIS 872**AHIS 872 Photography Since 1960****Crosslisted with:** AHIS 472**Prerequisites:** AHIS 471/871 or permission.**Description:** Movements in photography since 1960 with emphasis on the interaction with art theory and criticism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 876 History of Prints****Crosslisted with:** AHIS 476**Prerequisites:** 12 hrs in art history, including AHIS 221, 226, or AHIS 231, or in related disciplines with permission.**Description:** Introduction to the history of prints stressing printmaking techniques, i.e., woodcut, engraving, drypoint, etching, and the makers of prints during the first 300 years of printmaking in Europe. Baldung, Goltzius, Bruegel, and Rembrandt. Major technical developments, such as the introduction of printing colored woodcuts, are included.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**AHIS 890 Directed Individual Reading****Crosslisted with:** AHIS 490**Prerequisites:** Permission of department chair.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** IND**AHIS 891 Internship in Art Museums****Description:** Introduce graduate students to and offer them hands-on experience with curatorial planning, research, art handling, exhibition design and installation, publicity and publications.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**AHIS 892 Independent Research in Art History****Crosslisted with:** AHIS 492**Prerequisites:** Permission of department chair.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** IND**AHIS 895 Internship in Art History****Crosslisted with:** AHIS 495**Prerequisites:** Senior standing and permission of department chair.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** FLD**AHIS 896 Advanced Archaeological Fieldwork****Crosslisted with:** AHIS 496**Prerequisites:** AHIS 286 or equivalent, and permission.**Description:** Further training in archaeological field research techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Format:** FLD**AHIS 898 Special Topics in Art History****Crosslisted with:** AHIS 498**Prerequisites:** Permission.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**AHIS 899 Masters Thesis****Prerequisites:** Permission**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND**AHIS 901 Methodology and Historiography****Prerequisites:** Permission**Description:** History of the discipline, with an examination of the various art historical approaches. Development and refinement of specialized research skills appropriate to the field.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

AHIS 905 History of Art Museums, Collections, and Exhibitions

Description: Introduction to the history of museums and to collecting practices in Western Europe and the United States that have influenced the ways in which art and culture are understood in art history and related disciplines (archaeology, anthropology). Takes into account both cultures that collect and cultures that are collected. Provides critical vocabulary and framework for understanding how museums produce knowledge, social hierarchies and cultural differences, and how this structure has changed over time.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AHIS 805

AHIS 911 Seminar in Classical Art and Archaeology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 916 Seminar in Medieval Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 921 Seminar in Italian Renaissance Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 926 Seminar in Northern Renaissance Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 931 Seminar in Baroque Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 946 Seminar in Modern Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 951 Seminar in American Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 956 Seminar in Latin American Art

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 977 Seminar in Latin American Art

Prerequisites: Permission

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 980 Seminar in Art Historical Problems

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 988 Introduction to the Interdisciplinary Study of the Middle Ages

Crosslisted with: ENGL 988, HIST 988, MODL 988, MUSC 988

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Middle Ages. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

AHIS 989 Introduction to the Interdisciplinary Study of the Renaissance

Crosslisted with: ENGL 989, HIST 989, MODL 989, MUSC 989

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Renaissance. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Art Theory and Practice (ARTP)

ARTP 880 Japanese Visual Culture in Context

Crosslisted with: ADPR 480, ARTP 480, ADPR 880

Prerequisites: Permission

Notes: Letter grade only. A study abroad course that includes four days on campus in Lincoln and two and one-half weeks in Japan.

Description: Test and hone visual literacy skills in a foreign country.

Observe, analyze, and interpret visual information without the aid of text in the native Japanese language. Sharpen perceptual and analytical skills through daily drawing, writing, and photography in Japan. Increase global awareness through analysis of an issue.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: SDO

ARTP 896 Advanced Problems in Studio

Prerequisites: Permission
Description: Problems in technique and expression on a tutorial basis.
Credit Hours: 1-24
Min credits per semester: 1
Max credits per semester: 24
Max credits per degree: 24
Format: SDO

ARTP 899 Studio Thesis

Prerequisites: Admission to masters degree program and permission of major adviser
Description: Original work in studio, under direction.
Credit Hours: 1-10
Min credits per semester: 1
Max credits per semester: 10
Max credits per degree: 99
Format: IND

ARTP 996 Problems in Studio Art

Prerequisites: Permission
Description: Problems in technique and expression. Advanced laboratory experience.
Credit Hours: 1-24
Min credits per semester: 1
Max credits per semester: 24
Max credits per degree: 24
Format: SDO

ARTP 997 Colloquium

Prerequisites: Permission
Description: Problems and approaches relating to the practice of art, with special attention to media.
Credit Hours: 1-24
Min credits per semester: 1
Max credits per semester: 24
Max credits per degree: 24
Format: LEC

Art-Ceramics (CERM)

CERM 831 Ceramics I

Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 6
Format: SDO
Prerequisite for: CERM 931; CERM 932

CERM 832 Ceramics II

Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 6
Format: SDO
Prerequisite for: CERM 931; CERM 932

CERM 834 Glaze Formulation

Crosslisted with: CERM 434
Prerequisites: Permission.
Description: Practical and theoretical information to develop, mix, fire, and troubleshoot ceramic surfaces for pottery and sculpture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: SDO

CERM 835 Kiln Design and Construction

Crosslisted with: CERM 435
Prerequisites: Permission.
Description: Design and build a kiln for firing pottery or sculpture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: SDO

CERM 836 Making History: History of Ceramics

Crosslisted with: CERM 436
Prerequisites: Permission.
Description: Study of the history of ceramic art through focused research and recreation of individual objects.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: SDO

CERM 891 Special Topics in Ceramics

Crosslisted with: CERM 491
Prerequisites: Permission.
Description: Topic varies.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 24
Format: SDO

CERM 896 Advanced Problems in Ceramics

Prerequisites: Permission.
Description: Problems in technique and expression.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 24
Format: SDO

CERM 899 Studio Thesis in Ceramics

Prerequisites: Admission to masters degree program and permission of major adviser
Description: Original work in studio.
Credit Hours: 1-10
Min credits per semester: 1
Max credits per semester: 10
Max credits per degree: 99
Format: SDO

CERM 931 Ceramics III**Prerequisites:** CERM 831-832**Description:** Graduate-level individual work in ceramics.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**CERM 932 Ceramics IV****Prerequisites:** CERM 831-832**Description:** Graduate-level individual work in ceramics.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**CERM 996 Problems in Ceramics****Prerequisites:** Permission**Description:** Problems in technique and expression. Advanced laboratory experience.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** SDO

Art-Drawing (DRAW)

DRAW 801 Drawing I**Description:** Graduate-level work in various drawing media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**DRAW 802 Drawing II****Description:** Graduate-level work in various drawing media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**DRAW 896 Problems in Drawing****Crosslisted with:** DRAW 496**Prerequisites:** Permission of the Instructor**Description:** Independent Study in Drawing**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND**DRAW 901 Drawing III****Description:** Graduate-level work in drawing, that can include the exploration of a variety of media and visual ideas.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**DRAW 902 Drawing IV****Description:** Graduate-level work in drawing, that can include the exploration of a variety of media and visual ideas.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

Art-Graphic Design & Illustration (GRPH)

GRPH 821 Graphic Design I**Description:** Graduate-level work in various graphic design media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**GRPH 822 Graphic Design II****Description:** Graduate-level work in various graphic design media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**GRPH 825 Interaction Design II: Interactive Storytelling****Crosslisted with:** GRPH 425**Prerequisites:** GRPH 325.**Description:** Exploration of interactive, multi-dimensional storytelling on the web, mobile devices, gaming systems and tablets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**GRPH 896 Problems in Graphic Design****Crosslisted with:** GRPH 496**Prerequisites:** Graphic Design major and permission.**Notes:** Topics, activities, and delivery methods vary depending on individual course expectations.**Description:** Independent study course exploring subject matter in specialized areas of graphic design.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**GRPH 921 Advanced Graphic Design I****Prerequisites:** GRPH 821-822 or permission**Description:** Advanced graduate-level work in various graphic design media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

GRPH 922 Advanced Graphic Design II**Prerequisites:** GRPH 821-822 or permission**Description:** Advanced graduate-level work in various graphic design media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**GRPH 925 Book Arts****Prerequisites:** GRPH 825 or permission**Description:** Continued graduate work in limited edition and/or unique book arts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

Art-Painting (PANT)

PANT 851 Painting I**Description:** Graduate-level work in various painting media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PANT 951; PANT 952**PANT 852 Painting II****Description:** Graduate-level work in various painting media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PANT 951; PANT 952**PANT 896 Problems in Painting****Crosslisted with:** PANT 496**Prerequisites:** Permission of Instructor**Description:** Independent Study in Painting**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND**PANT 951 Painting III****Prerequisites:** PANT 851-852**Description:** Graduate-level work in various painting media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**PANT 952 Painting IV****Prerequisites:** PANT 851-852**Description:** Graduate-level work in various painting media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

Art-Photography (PHOT)

PHOT 861 Photography I**Prerequisites:** Permission**Description:** Graduate-level work in various photographic media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PHOT 862; PHOT 899; PHOT 961**PHOT 862 Photography II****Prerequisites:** PHOT861**Description:** Graduate-level work in various photographic media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PHOT 899; PHOT 961**Groups:** Additional Anthropology Course**PHOT 891 Special Topics in Photography****Crosslisted with:** PHOT 491**Prerequisites:** PHOT 261.**Description:** Special Topics in Photography.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 18**Format:** SDO**PHOT 896 Problems in Photography****Prerequisites:** Permission**Description:** Problems in technique and expression. Independent study.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**PHOT 899 Studio Thesis in Photography****Prerequisites:** PHOT 861, 862, 961, 962**Description:** Thesis work in various photographic media and concepts.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND

PHOT 961 Photography III**Prerequisites:** PHOT861, 862**Description:** Graduate-level work in various photographic media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PHOT 899; PHOT 962**PHOT 962 Photography IV****Prerequisites:** PHOT961**Description:** Graduate-level work in various photographic media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** PHOT 899**PHOT 996 Advanced Problems in Photography****Prerequisites:** Permission**Description:** Problems in technique and expression. Advanced laboratory experience. Independent study.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND

Art-Printmaking (PRNT)

PRNT 841 Printmaking I**Description:** Graduate-level work in various printmaking media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**PRNT 842 Printmaking II****Description:** Graduate-level work in various printmaking media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**PRNT 891 Special Topics in Printmaking****Crosslisted with:** PRNT 491**Description:** Special Topics in Printmaking, advanced level.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC**PRNT 896 Problems in Printmaking****Crosslisted with:** PRNT 496**Prerequisites:** Permission of Instructor**Description:** Independent study in printmaking.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** LEC**PRNT 941 Printmaking III****Prerequisites:** PRNT 841-842**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**PRNT 942 Printmaking IV****Prerequisites:** PRNT 841-842**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**PRNT 996 Problems in Printmaking****Prerequisites:** Permission**Description:** Independent study in Printmaking.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** SDO

Art-Sculpture (SCLP)

SCLP 811 Sculpture I**Description:** Graduate-level work in various sculpture media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** SCLP 911; SCLP 912**SCLP 812 Sculpture II****Description:** Graduate-level work in various sculpture media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** SCLP 911; SCLP 912

SCLP 896 Problems in Sculpture**Crosslisted with:** SCLP 496**Prerequisites:** Permission of Instructor**Description:** Independent Study in Sculpture**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND**SCLP 911 Sculpture III****Prerequisites:** SCLP 811-812**Description:** Graduate-level work in various sculpture media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**SCLP 912 Sculpture IV****Prerequisites:** SCLP 811-812**Description:** Graduate-level work in various sculpture media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

Art-Special Topics (ARTS)

ARTS 898 Special Topics in Studio Art IV**Crosslisted with:** ARTS 498**Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** SDO**ARTS 898A Special Topics in Art IV****Crosslisted with:** ARTS 498A**Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC

Art-Watercolor (WATC)

WATC 857 Watercolor I**Description:** Graduate-level work in various watercolor media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** WATC 957; WATC 958**WATC 858 Watercolor II****Description:** Graduate-level work in various watercolor media and concepts.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** WATC 957; WATC 958**WATC 957 Watercolor III****Prerequisites:** WATC 857-858**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**WATC 958 Watercolor IV****Prerequisites:** WATC 857-858**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO

Astronomy (ASTR)

ASTR 803 Galactic and Extragalactic Astronomy**Crosslisted with:** ASTR 403**Prerequisites:** ASTR 204 and PHYS 213, and permission.**Description:** Introduction to the techniques for determining constituents and dynamics of our galaxy, including interstellar matter and theories of spiral arm formation. Extragalactic topics include basic characteristics of galaxies, active galaxies, quasars, evolution, and the cosmological distance scale.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASTR 804 Stellar Astrophysics****Crosslisted with:** ASTR 404**Prerequisites:** ASTR 204; PHYS 213; and permission.**Description:** Stellar atmospheres, interiors, and evolution. Theoretical and observational aspects of stellar astronomy. The relation between observed parameters and theoretical parameters, star formation, stellar energy generation, and degenerate stars.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASTR 805 Physics of the Solar System****Crosslisted with:** ASTR 405**Prerequisites:** ASTR 204; MATH 107/107H; PHYS 142/142H or PHYS 212/212H.**Description:** Celestial mechanics; tidal effects; planetary interiors; atmospheres and surfaces; comets; asteroids; and the origin of the solar system. Applying physics to the solution of solar system problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ASTR 807 Physics of the Interstellar Medium**Crosslisted with:** ASTR 407**Prerequisites:** ASTR 204 and PHYS 213.**Description:** Gaseous nebulae, interstellar dust, interstellar clouds and star forming regions. Theoretical and observational aspects of the various components of the interstellar medium. Includes the physics of emission nebulae, the properties of the interstellar dust, interstellar molecules and the properties of clouds in which star formation occurs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASTR 898 Special Topics****Crosslisted with:** ASTR 498**Prerequisites:** ASTR 204 and permission.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ASTR 997 Special Topics in Astronomy****Prerequisites:** Permission**Description:** Offered as the need arises to treat special topics in astronomy not covered in other 900-level courses.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND

Biological Chemistry (BIOC)

BIOC 810 Plant Molecular Biology**Crosslisted with:** AGRO 810, HORT 810**Prerequisites:** AGRO 215 or BIOS 206; BIOC 831**Description:** Molecular genetic basis of biological function in higher plants. Genome organization, gene structure and function, regulation of gene expression, recombinant DNA, and genetic engineering principles. Material taken primarily from current literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**BIOC 818 Agricultural Biochemistry****Crosslisted with:** AGRO 818**Prerequisites:** Undergraduate major in life sciences or related area, and a course in biochemistry**Description:** A Web-based course. Biochemical underpinnings of agricultural production and processing systems. Agricultural biotechnology; bioenergetics; kinetics and enzyme regulation; interaction of biomolecules with light, photosynthesis and the balance between anabolism and catabolism in microbes, plants and animals.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** IND**Prerequisite for:** VBMS 919**BIOC 831 Structure and Metabolism****Crosslisted with:** BIOC 431, BIOS 431, BIOS 831, CHEM 431, CHEM 831**Prerequisites:** LIFE 120 with a grade of C or better; CHEM 252 or CHEM 262 with a grade of C or better.**Notes:** BIOS 206 or AGRO 215 is recommended. First course of a two-semester, comprehensive biochemistry course sequence.**Description:** Structure and function of proteins, nucleic acids, carbohydrates and lipids; nature of enzymes; major metabolic pathways of catabolism; and biochemical energy production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; AGRO 810, BIOC 810, HORT 810; ASCI 820; ASCI 917; ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927; BIOC 305; BIOC 432, BIOC 832, BIOS 432, CHEM 432, CHEM 832, BIOS 832; BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833; BIOS 879; BIOS 950, VBMS 950; BSEN 416, BSEN 816; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; VBMS 410; VBMS 805**BIOC 832 Metabolism and Biological Information****Crosslisted with:** BIOC 432, BIOS 432, CHEM 432, CHEM 832, BIOS 832**Prerequisites:** BIOC 431/831 with a grade of C or better; BIOS 206 or AGRO 215 with a grade of C or better.**Notes:** Continuation of BIOC 431/831.**Description:** Major metabolic pathways of anabolism, structural and biochemical aspects of biological information flow and use in biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 435; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 934, BIOS 934, CHEM 934; BIOC 935, BIOS 935, CHEM 935; BIOC 992K, CHEM 992K; BIOC 998; BIOS 950, VBMS 950; VBMS 919; VBMS 951**BIOC 833 Biochemistry Laboratory****Crosslisted with:** BIOC 433, BIOS 433, BIOS 833, CHEM 433, CHEM 833**Prerequisites:** BIOC 431/831 or parallel; or CHEM 435/835.**Description:** Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898; CHEM 498

BIOC 834 Plant Biochemistry

Crosslisted with: AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOS 834, CHEM 834

Prerequisites: BIOC/BIOS/CHEM 431/831.

Description: Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOC 836 Physical Basis of Macromolecular Function

Crosslisted with: CHEM 836

Description: Introduction to the theory and practice of biophysical characterization of macromolecules. The course will be based on primary research literature, although a supporting text will be used for in depth discussion of the methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOC 837 Research Techniques in Biochemistry

Crosslisted with: BIOC 437, BIOS 437, BIOS 837

Prerequisites: BIOC/BIOS/CHEM 433/833.

Description: Methods approach to systems biology analysis. Molecular identification and quantification employing techniques such as mass spectrometry, chromatography, electrophoretic fractionation, transcriptomics, proteomics and metabolomics. Data and pathway analysis with computational methods.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: VBMS 919

BIOC 839 Dynamics of Biochemical and Biological Networks

Crosslisted with: BIOC 439, BIOS 439, BIOS 839

Prerequisites: BIOS 206 or AGRO 215; BIOC 321 or BIOC 431

Description: To introduce and integrate, students in biochemistry and other life sciences, to the field of computational modeling of biochemical and biological network systems into a seamless curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

Prerequisite for: ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 992K, CHEM 992K; BIOC 998

BIOC 842 Computational Biology

Crosslisted with: STAT 842, STAT 442, BIOC 442

Prerequisites: Any introductory course in biology, or genetics, or statistics.

Description: Databases, high-throughput biology, literature mining, gene expression, next-generation sequencing, proteomics, metabolomics, system biology and biological networks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOC 848 Redox Biochemistry

Crosslisted with: CHEM 848

Prerequisites: 3 hrs BIOC and 3 hrs inorganic chemistry

Description: Redox (oxidation and reduction)-based biochemical processes (energy generation, oxygen transfer, enzyme catalysis, signaling, gene regulation, and diseases). Recent progress in these areas. Roles of metals in biochemical reactions, metal homeostasis, and biosynthesis of metal cofactors and metal sites. Biochemistry and pathophysiology of redoxactive species and radicals. Antioxidant molecules and enzymes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOC 886 Advanced Topics in Biophysical Chemistry

Crosslisted with: BIOC 486, BIOS 486, BIOS 886, CHEM 486, CHEM 886

Prerequisites: CHEM 471/871 or CHEM 481/881.

Description: Applications of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOC 898 Research in Biochemistry

Prerequisites: BIOC 833 and permission

Description: Laboratory research on a specific problem under the supervision of a biochemistry faculty member.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

BIOC 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

BIOC 932 Proteins

Crosslisted with: BIOS 932, CHEM 932

Prerequisites: BIOC/BIOS/CHEM 832 or BIOC/BIOS/CHEM 839

Description: Protein structure and function.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

BIOC 933 Enzymes

Crosslisted with: BIOS 933, CHEM 933

Prerequisites: BIOC/BIOS/CHEM 432/832, or BIOC/BIOS/CHEM 839

Description: Kinetics regulation and reaction mechanisms of enzymes.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

BIOC 934 Genome Dynamics and Gene Expression**Crosslisted with:** BIOS 934, CHEM 934**Prerequisites:** BIOC/BIOS/CHEM 832 or permission**Description:** Detailed examination of dynamic control mechanisms of genome maintenance and gene regulation. Mechanisms of transcription, translation, and replication based on analysis of current and seminal literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOC 935 Metabolic Function and Dysfunction****Crosslisted with:** BIOS 935, CHEM 935**Prerequisites:** BIOC/CHEM/BIOS 432/832 and permission**Description:** Current metabolic research at the bioenergetic, metabolomic, and molecular level. The normal metabolic processes that go awry in cancer, obesity, and oxidative stress.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOC 949 Biochemistry of Nutrition****Crosslisted with:** ASCI 949, BIOS 949, NUTR 949**Prerequisites:** BIOC 832 or 839**Notes:** Offered odd-numbered calendar years.**Description:** Offered odd-numbered calendar years. Interrelationships of nutrients, nutritional state and metabolic processes. Energy metabolism, integration of nutrition and metabolism and nutritional regulation of gene function.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**BIOC 992K Seminar in Biological Chemistry****Crosslisted with:** CHEM 992K**Prerequisites:** BIOC 832 or 839; and permission**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**BIOC 998 Advanced Topics in Biochemistry****Prerequisites:** BIOC 832 and 839**Description:** BIOC 998 is a special biochemistry topics when faculty and student needs cannot be met by other courses.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOC 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Biological Sciences (BIOS)

BIOS 802 Cancer Biology**Crosslisted with:** BIOS 402**Prerequisites:** BIOS 206 and Senior standing.**Description:** Principles of cancer genetics, cancer prevention, and new methods for diagnosis and therapy. Fundamentals of the cell and molecular events that lead to human cancer.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 803 Principles of Evolution****Description:** Micro- and macroevolutionary patterns and processes. Population genetics, evolutionary ecology, speciation, phylogenetic systematics, and biogeographic patterns of extant and extinct taxa.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 804 Principles of Behavioral Ecology****Description:** Introduction to the ecology and evolution of animal behavior.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** BIOS 955; BIOS 962**BIOS 805 Principles of Ecology****Description:** Ecological principles at the populations, community, and ecosystem levels. Population growth, meta-population dynamics, competitive and predatory interactions, temporal and spatial variation in community food webs, tropic cascades, patterns and mechanisms underlying species diversity, ecosystem processes, nutrient cycling, and global change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** BIOS 955; BIOS 958**BIOS 806 Insect Ecology****Crosslisted with:** BIOS 406, ENTO 406, ENTO 806**Prerequisites:** BIOS/NRES 220 and 222.**Description:** Biotic and abiotic factors as they influence insect development, behavior, distribution, and abundance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 807 Biology of Cells and Organelles****Crosslisted with:** BIOS 407**Prerequisites:** BIOS 206.**Description:** Regulation and timing of macromolecular synthesis during the cell cycle; the genetic autonomy of mitochondria and chloroplasts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BIOS 808 Functional Histology**Crosslisted with:** BIOS 408, VBMS 408, VBMS 808**Prerequisites:** BIOS 101 and 101L or LIFE 120 and 120L or BIOS 112; BIOS 213 or ASCI 240 or ASCI 340.**Description:** Microscopic anatomy of the tissues and organs of major vertebrate species, including humans. Normal cellular arrangements of tissues and organs as related to their macroscopic anatomy and function, with reference to sub-cellular characteristics and biochemical processes. Functional relationships among cells, tissues, organs and organ systems, contributory to organismal well being. General introduction to pathological processes and principles underlying some diseases.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 809 Professionalism****Notes:** Pass/No Pass only.**Description:** Discussion of skills needed to be a professional scientist including: writing, submitting, editing, and revision of journal articles and grant proposals; preparation of oral and poster presentations; and ethical issues in research and teaching.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**BIOS 811 Plant Tissue Culture****Crosslisted with:** HORT 811, NRES 811**Description:** Survey of techniques used in plant cell, tissue and organ culture, including current research. Laboratory emphasizes practical manipulation of plant cells, tissues, and organs, including examples from woody and herbaceous plant species.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 812 Human Genetics****Crosslisted with:** BIOS 412**Prerequisites:** BIOS 206 and Senior standing.**Description:** Genetic basis of human variation, with emphasis on methods of applying genetic principles to humankind. Genetic ratios in pooled data; population and quantitative genetics; consanguinity; polygenic inheritance; blood types; sex linkage; linkage and crossing over; sex determination; visible chromosome variation; mutation; heredity and environment; eugenics; anthropological genetics; molecular genetics and molecular basis of disease; human genome project.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 815 Developmental Biology****Crosslisted with:** BIOS 415**Prerequisites:** BIOS 206.**Description:** Survey of topics in developmental biology, both animal and plant development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 816 Biodiversity Conservation****Crosslisted with:** BIOS 416**Prerequisites:** BIOS 207 or NRES 220**Description:** Basic conservation science theory and conservation decision making tools which are essential for making effective decisions for biodiversity conservation. Topics include systematic conservation planning, population viability analysis, risk assessment, and applying those tools to real conservation problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 818 Advanced Genetics****Crosslisted with:** BIOS 418**Prerequisites:** BIOS 206 and Senior standing.**Description:** In-depth study of the principles and methodology of genetics, with emphasis on *Drosophila*: multiple alleles and complex loci, linkage and recombination, chromosome rearrangements, fine structure analysis, sex determination, recombinant DNA, and gene function in development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 820 Molecular Genetics****Crosslisted with:** BIOS 420, VBMS 820, MBIO 420**Prerequisites:** BIOS 206 and Senior standing.**Description:** Molecular basis of genetics. Gene structure and regulation, transposable elements, chromosome structure, DNA replication, and repair mechanisms and recombination.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** BIOS 945; BIOS 964, VBMS 964; FDST 908B**BIOS 821 Microbial Diversity****Crosslisted with:** BIOS 421, MBIO 421**Prerequisites:** BIOS 206 and BIOS 312 and Senior Standing.**Description:** Diversity of microbial cell composition, structure, and function enabling movement, metabolism, symbiosis, and adaptation using bacterial, fungal, algal, and viral examples. A physiological, biochemical and molecular approach used throughout.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 822 Comparative Physiology****Crosslisted with:** BIOS 422**Prerequisites:** BIOS 213**Description:** Comprehensive survey of comparative physiology with emphasis on the diversity of adaptations in basic physiological systems and the effects of environmental parameters upon such systems.

Comparative physiology of osmoregulation, temperature regulation, metabolism, muscle, central nervous function, and sensory function.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BIOS 823 Quaternary Paleoclimatology and Paleoecology**Crosslisted with:** BIOS 423, GEOL 423, GEOL 823**Prerequisites:** 12 hrs GEOL or BIOS.**Description:** Analysis and interpretation of the Quaternary period's paleoecological data. Patterns of long-term climate variation. Distribution patterns and responses of organisms and ecosystems to Quaternary environmental change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 824 Biogeochemical Cycles****Crosslisted with:** BIOS 424, GEOL 424, GEOL 824**Prerequisites:** CHEM 109 or 113; 12 hrs GEOL or BIOS.**Description:** Chemical cycling at or near the earth's surface, emphasizing interactions among the atmosphere, biosphere, geosphere and hydrosphere. Modern processes, the geological record, and human impacts on elemental cycles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 825 Plant Biotechnology****Crosslisted with:** BIOS 425**Prerequisites:** BIOS 206.**Description:** Introduction to the use of plants for basic and applied purposes by deliberate manipulation of their genomes; techniques in plant genetic engineering; manipulations of plant development and metabolism; engineering pest, disease, and stress resistance; plants as bioreactors; and environmental and social impacts of plant biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 826 Systems Biology****Crosslisted with:** BIOS 426**Prerequisites:** LIFE 120 and LIFE 121 or BIOS 101; STAT 218 or STAT 380 or EDPS 459 or PSYC 350 or ECON 215.**Notes:** BIOS 206 and CSCE 155T are recommended, but not required.**Description:** Fundamentals of the analysis of high throughput experiments to understand complex biological systems. Principles and methods such as next generation sequencing, protein-protein interaction networks, regulatory networks, and biological data mining and integration. Emerging research in new biotechnology and data analysis in biomedical and life sciences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 827 Practical Bioinformatics Laboratory****Crosslisted with:** BIOS 427**Prerequisites:** BIOS 206**Notes:** No computer programming skill is required.**Description:** Basic knowledge and skills needed for general bioinformatics, genomics and proteomics analyses. Various computational analyses including database search, sequence alignment, phylogenetic reconstruction, gene prediction/mining, microarray data analyses and protein structure analyses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 828 Perl Programming for Biological Applications****Crosslisted with:** BIOS 428**Prerequisites:** LIFE 120 and LIFE 121.**Description:** Computer programming, using Perl, as applied to biological sciences, bioinformatics, computational biology, and genomics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 829 Phylogenetic Biology****Crosslisted with:** BIOS 429**Prerequisites:** BIOS 207 and Senior standing.**Description:** Principles of phylogenetic inference and emphasis on the application of phylogenetic hypotheses in biology and the biomedical sciences. How inferences derived from phylogenetic trees can be applied in different areas of biological investigation including systematics, biogeography, conservation biology, molecular evolution, genome structure, epidemiology, population biology, ecology, character evolution, behavior, and macroevolution.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 830 Communicating Science through Outreach****Crosslisted with:** BIOS 430**Prerequisites:** BIOS 207.**Notes:** Students must have at least one afternoon available for running a middle school science club (typically between 3-5pm). Background checks required.**Description:** Introduction to science communication, formal versus informal science education, and best practices in informal science education. Review of state and national science standards and how students learn. Introduction to informal science practitioners and facilities in Nebraska. Role playing and development and implementation of hands on, inquiry-based science activities. Training in evaluation and assessment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

BIOS 831 Structure and Metabolism**Crosslisted with:** BIOC 431, BIOC 831, BIOS 431, CHEM 431, CHEM 831**Prerequisites:** LIFE 120 with a grade of C or better; CHEM 252 or CHEM 262 with a grade of C or better.**Notes:** BIOS 206 or AGRO 215 is recommended. First course of a two-semester, comprehensive biochemistry course sequence.**Description:** Structure and function of proteins, nucleic acids, carbohydrates and lipids; nature of enzymes; major metabolic pathways of catabolism; and biochemical energy production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; AGRO 810, BIOC 810, HORT 810; ASCI 820; ASCI 917; ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927; BIOC 305; BIOC 432, BIOC 832, BIOS 432, CHEM 432, CHEM 832, BIOS 832; BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833; BIOS 879; BIOS 950, VBMS 950; BSEN 416, BSEN 816; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; VBMS 410; VBMS 805**BIOS 832 Metabolism and Biological Information****Crosslisted with:** BIOC 432, BIOC 832, BIOS 432, CHEM 432, CHEM 832**Prerequisites:** BIOC 431/831 with a grade of C or better; BIOS 206 or AGRO 215 with a grade of C or better.**Notes:** Continuation of BIOC 431/831.**Description:** Major metabolic pathways of anabolism, structural and biochemical aspects of biological information flow and use in biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 435; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 934, BIOS 934, CHEM 934; BIOC 935, BIOS 935, CHEM 935; BIOC 992K, CHEM 992K; BIOC 998; BIOS 950, VBMS 950; VBMS 919; VBMS 951**BIOS 833 Biochemistry Laboratory****Crosslisted with:** BIOC 433, BIOC 833, BIOS 433, CHEM 433, CHEM 833**Prerequisites:** BIOC 431/831 or parallel; or CHEM 435/835.**Description:** Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898; CHEM 498**BIOS 834 Plant Biochemistry****Crosslisted with:** AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, CHEM 834**Prerequisites:** BIOC/BIOS/CHEM 431/831.**Description:** Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 835 Evolutionary Medicine****Crosslisted with:** BIOS 435**Prerequisites:** BIOS 207**Description:** Application of evolutionary tools to biomedical questions. Managing the evolution of drug resistance and pathogen virulence. Evolutionary principles of vaccine design. Emerging infectious disease. Human evolutionary history. Life-history trade-offs in human evolution. Parent-offspring and parent-parent conflict. Mismatch hypothesis. Hygiene hypothesis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**BIOS 837 Research Techniques in Biochemistry****Crosslisted with:** BIOC 437, BIOC 837, BIOS 437**Prerequisites:** BIOC/BIOS/CHEM 433/833.**Description:** Methods approach to systems biology analysis. Molecular identification and quantification employing techniques such as mass spectrometry, chromatography, electrophoretic fractionation, transcriptomics, proteomics and metabolomics. Data and pathway analysis with computational methods.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** VBMS 919**BIOS 839 Dynamics of Biochemical and Biological Networks****Crosslisted with:** BIOC 439, BIOC 839, BIOS 439**Prerequisites:** BIOS 206 or AGRO 215; BIOC 321 or BIOC 431**Description:** To introduce and integrate, students in biochemistry and other life sciences, to the field of computational modeling of biochemical and biological network systems into a seamless curriculum.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 992K, CHEM 992K; BIOC 998

BIOS 840 Microbial Physiology

Crosslisted with: BIOS 440, VBMS 840, MBIO 440

Prerequisites: BIOS 312; BIOS 313 or BIOS 314.

Description: Molecular approaches to the study of prokaryotic cell structure and physiology, including growth, cell division, metabolism, and alternative microbial life styles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 841 Pathogenic Microbiology

Crosslisted with: BIOS 441, VBMS 441, VBMS 441H, VBMS 841

Prerequisites: BIOS 312

Description: Fundamental principles involved in host-microorganism interrelationships. Identification of pathogens, isolation, propagation, mode of transmission, pathogenicity, symptoms, treatment, prevention of disease, epidemiology, and methods of control.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: VBMS 805; VBMS 949

BIOS 842 Endocrinology

Crosslisted with: ASCI 442, ASCI 842, BIOS 442, VBMS 842

Prerequisites: A course in vertebrate physiology and/or biochemistry.

Description: Mammalian endocrine glands from the standpoint of their structure, their physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 843 Immunology

Crosslisted with: BIOS 443, VBMS 843, MBIO 443

Prerequisites: BIOS 206; CHEM 251 or CHEM 255 or CHEM 261.

Description: Fundamental consideration of cellular and humoral mechanisms of immunity, the structure and function of immunoglobulins, antigen-antibody interactions; hypersensitivity; transplantation and tumor immunity; immune and autoimmune disorders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BIOS 966, VBMS 966; VBMS 852; VBMS 908; VBMS 910; VBMS 948; VBMS 949

BIOS 844 Geomicrobiology

Crosslisted with: BIOS 444, GEOL 444, GEOL 844

Prerequisites: 3 hours of BIOS or 3 hours of LIFE; 3 hours of CHEM

Description: Lectures and discussions of primary literature regarding microorganisms and their role transforming Earth through geologic time.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 845 Food Microbiology

Crosslisted with: BIOS 445, FDST 405, FDST 805

Prerequisites: BIOS 312; CHEM 251; BIOC 321.

Description: Nature, physiology, and interactions of microorganisms in foods. Introduction to food-borne diseases, the effect of food processing systems on the microflora of foods, principles of food preservation, food spoilage, and foods produced by microorganisms. Food plant sanitation and criteria for establishing microbial standards for food products.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BIOS 446, BIOS 846, FDST 406, FDST 806; FDST 415, FDST 815; FDST 425, FDST 825; FDST 455, FDST 855; FDST 455L, FDST 855L; FDST 460, FDST 860; FDST 875; FDST 877; FDST 908B

BIOS 846 Food Microbiology Laboratory

Crosslisted with: BIOS 446, FDST 406, FDST 806

Prerequisites: Parallel in FDST 405/805/BIOS 446/846.

Description: The microorganisms in foods and the methods used to study them.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LAB

Prerequisite for: FDST 415, FDST 815

BIOS 848 Human Growth and Development

Crosslisted with: ANTH 448, ANTH 848, BIOS 448

Prerequisites: ANTH 242 and 242L, or BIOS 101 and 101L.

Description: Biological diversity from an evolutionary perspective.

The history of the study of human physical growth and biological principles of growth. Genetic, epigenetic and hormonal effects on human and other mammal growth patterns, and environmental factors that influence growth. Effects of nutrition, disease, socio-economic status, pollution, etc. Unique features of human growth in its various stages. How anthropologists interpret variation in growth patterns among human populations and the possible adaptive significance of this variation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Biological Anthropology

BIOS 849 Woody Plant Growth and Development

Crosslisted with: HORT 849, NRES 849

Prerequisites: CHEM 251 and AGRO 325

Description: Plant growth and development specifically of woody plants as viewed from an applied whole-plant physiological level. Plant growth regulators, structure and secondary growth characteristics of woody plants, juvenility, senescence, abscission and dormancy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 850 Biology of Wildlife Populations**Crosslisted with:** BIOS 450, NRES 450, NRES 850**Prerequisites:** NRES 311; MATH 104 or above; STAT 218 or equivalent**Description:** Principles of population dynamics. Management strategies (for consumptive and nonconsumptive fish and wildlife species) presented utilizing principles developed.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**BIOS 852 Field Epidemiology****Crosslisted with:** BIOS 452**Prerequisites:** LIFE 121; LIFE 121L; three hours of BIOS**Notes:** Offered summers only at Cedar Point Biological Station.**Description:** Principles of epidemiology and the role in modern medicine. Combination of theory and practice with living populations.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** VBMS 949**BIOS 853 Predator Ecology****Crosslisted with:** BIOS 453**Prerequisites:** BIOS 207 or NRES 220**Description:** Conservation and management of native and invasive predators. Functional and numerical responses. Evolution of predator-prey interactions. Optimal foraging. Modeling predator-prey population dynamics. Trophic cascades. Prey defenses against predation.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 854 Ecological Interactions****Crosslisted with:** BIOS 454, NRES 454, NRES 854**Prerequisites:** LIFE 121; LIFE 121L; BIOS 207 or NRES 220; Senior Standing**Description:** Nature and characteristics of populations and communities. Interactions within and between populations in community structure and dynamics. Direct and indirect interactions and ecological processes, competition, predation, parasitism, herbivory, and pollination. Structure, functioning and persistence of natural communities, foodweb dynamics, succession, and biodiversity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 856 Mathematical Models in Biology****Crosslisted with:** BIOS 456, NRES 456, NRES 856**Prerequisites:** LIFE 120; LIFE 120L; LIFE 121; LIFE 121L; MATH 107**Description:** Biological systems, from molecules to ecosystems, are analyzed using mathematical techniques. Strengths and weaknesses of mathematical approaches to biological questions. Brief review of college level math; introduction to modeling; oscillating systems in biology; randomness in biology; review of historically important and currently popular models in biology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 857 Ecosystem Ecology****Crosslisted with:** BIOS 457, GEOL 457, GEOL 857**Prerequisites:** BIOS 207 and CHEM 110 and Senior standing.**Description:** Processes controlling the cycling of energy and elements in ecosystems and how both plant and animal species influence them. Human-influenced global and local changes that alter these cycles and ecosystem functioning.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BSEN 954, NRES 954**BIOS 859 Limnology****Crosslisted with:** BIOS 459, NRES 459, NRES 859, WATS 459**Prerequisites:** 12 hrs BIOS, including BIOS/NRES 220/BIOS220x; two semesters CHEM.**Description:** Physical, chemical, and biological processes that occur in fresh water. Organisms occurring in fresh water and their ecology; biological productivity of water and its causative factors; eutropication and its effects.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 866, NRES 866**BIOS 860 Soil Microbiology****Crosslisted with:** AGRO 460, BIOS 460, NRES 460, SOIL 460, AGRO 860, NRES 860**Prerequisites:** One semester microbiology; one semester biochemistry or organic chemistry.**Description:** Soil from a microbe's perspective-growth, activity and survival strategies; principles governing methods to study microorganisms and biochemical processes in soil; mechanisms controlling organic matter cycling and stabilization with reference to C, N, S, and P; microbial interactions with plants and animals; and agronomic and environmental applications of soil microorganisms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**BIOS 862 Animal Behavior****Crosslisted with:** BIOS 462**Prerequisites:** BIOS 206, 207 and Senior Standing.**Description:** Introduction to animal behavior stressing the ethological approach. Anatomical and physiological bases of behavior, ontogenetic and phylogenetic observations, and the relations of animal behavior studies to genetics, ecology, taxonomy, and evolution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BIOS 864 Fisheries Biology**Crosslisted with:** BIOS 464, NRES 464, NRES 864**Prerequisites:** BIOS/NRES 489/889 or equivalent.**Description:** Biology of fishes. Factors that affect fishes in the natural environment. Techniques used in the analysis and management of fish populations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 865 Behavioral Neuroscience****Crosslisted with:** BIOS 465, PSYC 465, PSYC 865**Prerequisites:** PSYC 273 or PSYC 373 or BIOS 373.**Description:** Relationship of physiological variables to behavior, an introduction to laboratory techniques in neuropsychology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 866 Advanced Limnology****Crosslisted with:** NRES 866**Prerequisites:** NRES 859 or equivalent**Description:** In-depth consideration of selected areas of limnology including stream limnology, primary production, secondary production, nutrient cycling, and eutrophication.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 868 Field Animal Behavior****Crosslisted with:** BIOS 468**Prerequisites:** LIFE 120 and LIFE 121**Notes:** BIOS 207 or BIOS 220 recommended. Offered summers only at Cedar Point Biological Station.**Description:** Behavior of animals. Stresses methods for testing evolutionary hypotheses under field conditions with emphasis on foraging behavior, animal communication, and animal social systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 870 Prairie Ecology****Crosslisted with:** BIOS 470**Prerequisites:** BIOS 207 or NRES 220**Notes:** Extensive field work is required.**Description:** Structure, function, and distribution of communities. Interaction of different species with their biotic and abiotic environments.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 871 Plant Systematics****Crosslisted with:** BIOS 471**Prerequisites:** LIFE 121 and LIFE 121L.**Description:** Overview of the diversity of plants and algae, with emphasis on phylogenetic relationships, the evolution of important physical and genomic characteristics, principles of plant classification and identification, and modern methods of plant molecular systematics. Lab work on taxonomic analysis and plant identification.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 874 Herpetology****Crosslisted with:** BIOS 474, NRES 474, NRES 874**Prerequisites:** BIOS/NRES 386 and permission.**Notes:** BIOS 388 recommended.**Description:** Fossil and living amphibians and reptiles. Anatomy, classification, ecology and evolution.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 875 Avian Biology****Crosslisted with:** BIOS 475**Prerequisites:** LIFE 121 & LIFE 121L.**Notes:** May also be offered at Cedar Point Biological Station.**Description:** Biology of birds emphasizing the behavior and ecology of this group. Topics include avian diversity, systematics & evolutionary history, flight, foraging, migration, communication, reproductive biology, population ecology and conservation biology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 875L Avian Biology Laboratory****Crosslisted with:** BIOS 475L**Prerequisites:** Parallel registration in BIOS 475/875**Description:** Avian field identification in diverse prairie, riparian, and montane habitats. Individual studies of foraging behavior, territoriality, anti-predator behavior, mating systems, or nesting ecology.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**BIOS 876 Mammalogy****Crosslisted with:** BIOS 476, NRES 476, NRES 876**Prerequisites:** 8 hrs BIOS; BIOS/NRES 386 or NRES 311.**Notes:** May also be offered at Cedar Point Biological Station. Field trips are required and may occur outside of scheduled class time. Lab and field time emphasize diversity of mammalian families and species identification of Nebraska mammals.**Description:** Evolution, natural history, ecology, and functional morphology of planetary mammals and mammals of the Northern Great Plains.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

BIOS 877 Bioinformatics and Molecular Evolution**Crosslisted with:** BIOS 477**Prerequisites:** BIOS 206 or parallel; CHEM 251 or CHEM 255 or CHEM 261.**Notes:** Statistics course recommended.**Description:** Pairwise and multiple alignments, sequence similarity and domain search, distance estimation, phylogenetic methods, gene mining, protein classification and structure. Algorithms used in bioinformatics as well as fundamental concepts of molecular evolution that underlie various bioinformatics methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 878 Plant Anatomy****Crosslisted with:** BIOS 478, AGRO 478, AGRO 878, HORT 478, HORT 878**Prerequisites:** 8 hrs biological sciences**Notes:** BIOS 109 recommended.**Description:** Development, structure, and function of tissues and organs of the higher plants. Relationships of structure to physiology and ecology of plants.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 879**BIOS 879 Plant Growth and Development****Prerequisites:** AGRO 325; BIOS 478/878; CHEM 252 or BIOC/BIOS/ CHEM 431/831**Description:** Processes involved in plant growth and development, seed formation, dormancy, germination, differential growth, flowering, and senescence. The role of extrinsic factors (e.g. light, water, and gravity) and intrinsic factors (e.g. hormones, pigments, and energy sources) on these processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 880 Ecology and Evolution of Arachnids****Crosslisted with:** BIOS 480**Prerequisites:** BIOS 207 or NRES 220**Description:** Ecology and evolutionary biology of living arachnids.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 882 Field Entomology****Crosslisted with:** BIOS 482, ENTO 482, ENTO 882**Prerequisites:** 12 hrs biological sciences.**Notes:** Offered only at Cedar Point Biological Station.**Description:** Field course in insect taxonomy and biology emphasizing field collection, specimen preparation, classification, and insect natural history.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SUMMER**BIOS 885 Aquatic Insects****Crosslisted with:** BIOS 485, ENTO 402, ENTO 802, NRES 402, NRES 802**Prerequisites:** 12 hrs biological sciences.**Description:** Biology and ecology of aquatic insects.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L**BIOS 885L Identification of Aquatic Insects****Crosslisted with:** BIOS 485L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L**Prerequisites:** Parallel ENTO 802, NRES 402/802, BIOS 485/885.**Description:** Identification of aquatic insects to the family level.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**BIOS 886 Advanced Topics in Biophysical Chemistry****Crosslisted with:** BIOC 486, BIOC 886, BIOS 486, CHEM 486, CHEM 886**Prerequisites:** CHEM 471/871 or CHEM 481/881.**Description:** Applications of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 887 Field Parasitology****Crosslisted with:** BIOS 487**Prerequisites:** LIFE 120; LIFE 120L; LIFE 121; LIFE 121L**Notes:** BIOS 207 or NRES 220 recommended. Offered summers only at Cedar Point Biological Station.**Description:** Animal host-parasite relationships, epizootiology, ecology, host distribution, classification, and life cycle stages of animal parasites.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BIOS 889 Ichthyology****Crosslisted with:** BIOS 489, NRES 489, NRES 889**Prerequisites:** LIFE 120 and LIFE 121**Notes:** May also be offered at Cedar Point Biological Station.**Description:** Fishes, their taxonomy, physiology, behavior, and ecology. Dynamics of fish stocks and factors regulating their production.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 464, BIOS 864, NRES 464, NRES 864; NRES 871; NRES 965

BIOS 897 Special Topics in Biological Sciences**Crosslisted with:** BIOS 497**Prerequisites:** BIOS 206 or BIOS 207**Description:** Topics vary by term.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 24**Format:** LEC**BIOS 898 Independent Research in Biological Sciences****Crosslisted with:** BIOS 498**Prerequisites:** Permission**Notes:** Four credit hours may be counted toward the undergraduate BIOS major. Before registering, arrangements must be made with a School of Biological Sciences faculty member to reach an agreement on the scope and to determine the amount of credit for the project.**Description:** Independent study and laboratory or field investigation of a specific problem.**Credit Hours:** 1-8**Min credits per semester:** 1**Max credits per semester:** 8**Max credits per degree:** 8**Format:** IND**BIOS 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**BIOS 910 Developmental Genetics****Description:** Effects of various mutations on developing biological systems. Mechanisms by which the abnormal genome expresses its pheno-type. Special consideration to vertebrate organisms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915 Graduate Seminar****Prerequisites:** Permission**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915A Genetics, Cellular and Molecular Biology (GCMB)****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915B Graduate Seminar - Behavioral Ecology****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915E Graduate Seminar - Ecology, Evolution and Behavior (EEBE)****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915M Graduate Seminar - Microbiology****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915N Population Ecology****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915P Graduate Seminar - Parasitology****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 915W Graduate Seminar - Evolutionary Biology****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 916 Research Seminar****Description:** Aimed at improving research design in evolutionary biology. Experience with presenting scientific ideas, as well as help with specific project.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 10**Format:** LEC**BIOS 920 Viral Evolution****Description:** The mechanisms by which DNA and RNA viruses evolve. The relationships between virulence, attenuation and host selection. Transfer of genetic material between virus and host. Evolution of HIV leading to escape from immunologic pressure or drug selection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BIOS 922 Viral Oncology****Description:** Viral oncogenes and the cellular pathways that they influence. The mechanisms by which DNA and RNA viruses cause cancer. Discovery of novel tumor viruses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BIOS 924 Molecular Phylogenetics

Description: Theory and methodology of phylogenetic inference based on molecular characters (mainly DNA sequences). Population genetic principles and analysis of microsatellite loci. Emphasis on project design, data analysis, and hypothesis testing. Training on current computer programs for phylogenetic analysis acquired.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

BIOS 932 Proteins

Crosslisted with: BIOC 932, CHEM 932

Prerequisites: BIOC/BIOS/CHEM 832 or BIOC/BIOS/CHEM 839

Description: Protein structure and function.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

BIOS 933 Enzymes

Crosslisted with: BIOC 933, CHEM 933

Prerequisites: BIOC/BIOS/CHEM 432/832, or BIOC/BIOS/CHEM 839

Description: Kinetics regulation and reaction mechanisms of enzymes.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

BIOS 934 Genome Dynamics and Gene Expression

Crosslisted with: BIOC 934, CHEM 934

Prerequisites: BIOC/BIOS/CHEM 832

Description: Detailed examination of dynamic control mechanisms of genome maintenance and gene regulation. Mechanisms of transcription, translation, and replication based on analysis of current and seminal literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 935 Metabolic Function and Dysfunction

Crosslisted with: BIOC 935, CHEM 935

Prerequisites: BIOC/CHEM/BIOS 432/832 and permission

Description: Current metabolic research at the bioenergetic, metabolomic, and molecular level. The normal metabolic processes that go awry in cancer, obesity, and oxidative stress.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 942 Genetics, Genomics, and Bioinformatics of Prokaryotes

Crosslisted with: VBMS 942

Description: Prokaryotic gene regulation, DNA exchange, DNA recombination and repair, comparative prokaryotic genomics and computer-based methods of analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 945 RNA Biology

Prerequisites: BIOS 820

Description: Role of RNA in regulation of gene expression and in determining genome structure. Regulation of mRNA stability and function, RNA as regulatory molecules and enzymes, and computer-based methods of analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 947 Industrial Microbiology and Biotechnology

Notes: BIOS 840 recommended.

Description: Biosynthetic activity of bacteria, yeasts, and fungi, including genetically engineered organisms: antibiotic, amino acid, enzyme, and vitamin production; polysaccharides, steroid transformation, microbes as food sources, microbial insecticides, petroleum microbiology, fermentation engineering, and mass production of microbial cells.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 949 Biochemistry of Nutrition

Crosslisted with: ASCI 949, BIOC 949, NUTR 949

Prerequisites: BIOC 832 or 839

Notes: Offered odd-numbered calendar years.

Description: Offered odd-numbered calendar years. Interrelationships of nutrients, nutritional state and metabolic processes. Energy metabolism, integration of nutrition and metabolism and nutritional regulation of gene function.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

BIOS 950 Medical Molecular Virology

Crosslisted with: VBMS 950

Prerequisites: BIOS/CHEM/BIOC 431/831 and 432/832; VBMS 852

Notes: Offered odd-numbered calendar years.

Description: Current topics in molecular virology relevant to the natural history and pathogenesis of viral diseases of humans and animals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 951 Quantitative Analysis in Biology

Description: Surveys the kinds of quantitative problems that arise in biological research, particularly in field-oriented disciplines such as ecology, evolution and behavior, and the quantitative methods used to solve them. Practical learning of the strengths and weaknesses of different methods through the analysis of biological data on microcomputers.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

BIOS 952 Likelihood & Bayesian Ecology

Description: Covers the use of maximum likelihood and Bayesian analysis in analyzing ecological data broadly defined. A conceptual understanding of the statistical tools is emphasized as well as a practical experience of conducting the analysis using real data and current software.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

BIOS 953 Advanced Population Ecology

Description: Ecological phenomena in populations. Quantitative description of population processes, life history strategies, foraging theory, resource interactions, population dynamics of competition and predation, and selected current topics in population ecology. Research methodology and historical development of the field as well as analysis, criticism, and synthesis of current research in the area.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 955 Advanced Behavioral Ecology

Prerequisites: BIOS 804 or BIOS 805

Description: Evolution of behavioral attributes of animals with respect to ecological conditions. Overview of the field and area of active research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 956 Biochemical Adaptation

Description: Major aspects of molecular/physiological adaptation in plants and animals including the evolution of metabolic pathways, enzyme function, and gene regulation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 957 Networks in Ecology and Evolution

Description: Fundamentals of network theory as it applies to ecology and evolution. A conceptual foundation for analyzing relational data focusing on ecological and social networks in non-human animals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 958 Genetic Ecology

Prerequisites: BIOS 805

Description: Interplay of genetics and ecology. Genetic basis of adaptation to environmental conditions and particularly the variety of ways in which this may occur.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 959 Advanced Community Ecology

Description: Ecological and evolutionary forces responsible for patterns of numbers and types of species which coexist and form ecological communities. Mathematical models, coevolution, random processes, historical background, and examination of biotic interactions responsible for the observed patterns. Emphasis on critique and synthesis of current theory in light of empirical evidence.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 960 Biosystematics and Nomenclature

Crosslisted with: ENTO 960

Description: Methods and principles of systematics and nomenclature.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 962 Animal Communication

Prerequisites: BIOS 804

Description: Course work in physics recommended. Advanced introduction to the evolution of animal communication. Addresses evolution of signal structure (including acoustic, visual, electrical, and chemical signals), environmental effects on signal transmission, and the evolution of receiver responses to signals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 964 Signal Transduction

Crosslisted with: VBMS 964

Prerequisites: BIOS 820.

Description: Molecular basis of genetics in eukaryotes. Gene structure and regulation, transposable elements, chromosome structure, DNA replication and repair mechanisms and recombination.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 966 Advanced Viral Pathogenesis

Crosslisted with: VBMS 966

Prerequisites: BIOS 843; VBMS 852 or equivalent introductory course in virology or experience

Description: Advanced analysis on the mechanisms of cell and tissue damage by viruses, the spread of viruses through the body, and the host response.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 967 Introduction to R for Biological Sciences

Description: Gain practical knowledge of the R programming language for statistical analysis, graphics, data management and simulations in the biological sciences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BIOS 996 Research

Prerequisites: Permission of instructor and departmental Graduate Committee

Description: Research other than thesis.

Credit Hours: 3-10

Min credits per semester: 3

Max credits per semester: 10

Max credits per degree: 10

Format: IND

BIOS 998 Special Topics in the Life Sciences

Prerequisites: Permission

Description: Reviews of specialized subject areas. Subject dependent on student demand and availability of staff.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

BIOS 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Biological Systems Engineering (BSEN)

BSEN 814 Medical Imaging Systems

Crosslisted with: BSEN 414

Prerequisites: BSEN 311 or ECEN 304

Description: Underlying physics, instrumentation, and signal analysis of biomedical and biological imaging modalities. MRI, X-ray, CT, ultrasound, nuclear medicine, and the human visual system. Energy-tissue interactions. Resolution, point spread function, contrast, diffraction, comparisons. Information content in images for biological systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BSEN 815 Introduction to Magnetic Resonance Imaging

Prerequisites: Familiarity with linear systems theory (e.g. BSEN 311 or ELEC 304) and MATLAB programming preferred; however, these topics are reviewed for clinicians and bio science students wishing to take the class

Description: Introduction to the physics, techniques, and biomedical applications of magnetic resonance imaging (MRI) in basic sciences and the clinic. Fundamentals of nuclear magnetic resonance physics, Fourier transforms, MRI hardware, and MRI principles including signal generation, detection and spatial localization techniques. Applications of MRI including tissue relaxometry and diffusion weighted imaging applications to diseases, traumatic brain injury, and cancer.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BSEN 816 Introduction to Biomaterials

Crosslisted with: BSEN 416

Prerequisites: BSEN/AGEN 225 or MECH 325; BIOC 321 or BIOC 431

Notes: Requires the evaluation of current primary literature in the field.

Description: Introduction to all types of bio-materials, metals, ceramics, polymers, and natural materials. Characterization of biomaterials, mechanical and physical properties, cell-biomaterials interactions, degradation, and host reaction to biomaterials. FDA testing and applications of biomaterials, implants, tissue engineering scaffolds, artificial organs, drug delivery, and adhesives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BSEN 418, BSEN 818

BSEN 818 Tissue Engineering

Crosslisted with: BSEN 418

Prerequisites: BSEN 416/816 or equivalent

Notes: Uses case studies to demonstrate clinical implementation of engineered tissues.

Description: Introduction to engineering biological substitutes that can restore, maintain or improve organ function in therapy of diseases. Engineering methods and principles to design tissues and organs, cell and tissue biology, tissue growth and development, biomaterial scaffolds, growth factor and drug delivery, scaffold-cell interactions, and bioreactors.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BSEN 822 Pollution Prevention: Principles and Practices

Crosslisted with: BSEN 422, CIVE 422, CIVE 822

Prerequisites: Permission.

Description: Introduction to pollution prevention (P2) and waste minimization methods. Practical applications to small businesses and industries. Legislative and historical development of P2 systems analysis, waste estimation, P2 methods, P2 economics, and sources of P2 information.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BSEN 841 Animal Waste Management

Crosslisted with: AGEN 441, AGEN 841, BSEN 441

Prerequisites: Senior standing.

Description: Characterization of wastes from animal production. Specification and design of collection, transport, storage, treatment, and land application systems. Air and water pollution, regulatory and management aspects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

BSEN 844 Biomass and Bioenergy Engineering**Crosslisted with:** BSEN 444**Prerequisites:** Senior/graduate standing in engineering; BIOC 321 or 431**Description:** Engineering processes for biomass conversion and bioenergy production. Topics include biomass chemistry, conversion reactions, current and emerging bioenergy technologies, feedstock logistics, life cycle assessment. Analysis of primary research literature required for graduate credit.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 846 Unit Operations of Biological Processing****Crosslisted with:** BSEN 446, AGEN 446, AGEN 846**Prerequisites:** AGEN/BSEN 225; and AGEN/BSEN 344**Description:** Application of heat, mass, and moment transport in analysis and design of unit operations for biological and agricultural materials. Evaporation, drying, distillation, extraction, leaching, thermal processing, membrane separation, centrifugation, and filtration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** BSEN 935**BSEN 853 Irrigation and Drainage Systems Engineering****Crosslisted with:** AGEN 453, AGEN 853, BSEN 453**Prerequisites:** CIVE 310 or MECH 310; AGEN 344 or BSEN 344.**Description:** Analytical and design consideration of evapotranspiration, soil moisture, and water movement as related to irrigation and drainage systems; analysis and design of components of irrigation and drainage systems including water supplies, pumping plants, sprinkler systems, and center pivots.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 854, MSYM 854**BSEN 855 Nonpoint Source Pollution Control Engineering****Crosslisted with:** BSEN 455, CIVE 455, CIVE 855**Prerequisites:** BSEN 326/CIVE 326 or BSEN 355; AGEN/BSEN 350 or CIVE 352 as prerequisite or parallel.**Description:** Identification, characterization, and assessment of nonpoint source pollutants; transport mechanisms and remediation technologies; design methodologies and case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**BSEN 858 Groundwater Engineering****Crosslisted with:** BSEN 458, CIVE 458, CIVE 858**Prerequisites:** CIVE 352 or AGEN 350 or BSEN 350**Description:** Application of engineering principles to the movement of groundwater. Analysis and design of wells, well fields, and artificial recharge. Analysis of pollutant movement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 955, AGRO 955, CIVE 955, GEOL 985**BSEN 860 Instrumentation and Controls****Crosslisted with:** AGEN 460, AGEN 860, BSEN 460**Prerequisites:** ELEC 211 or ELEC 215**Description:** Analysis and design of instrumentation and controls for agricultural and biological production, management and processing. Theory of basic sensors and transducers, analog and digital electrical control circuits, and the interfacing of computers with instruments and controls. Emphasis on signal analysis and interpretation for improving system performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 868 Wetlands****Crosslisted with:** BIOS 458, NRES 468, NRES 868, WATS 468, BSEN 468**Prerequisites:** 12 hrs biological sciences; BIOS 220; CHEM 109 and 110.**Notes:** Offered even-numbered calendar years.**Description:** Physical, chemical and biological processes that occur in wetlands; the hydrology and soils of wetland systems; organisms occurring in wetlands and their ecology wetland creation, delineation, management and ecotoxicology.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**BSEN 879 Hydroclimatology****Crosslisted with:** NRES 479, METR 479, WATS 479, BSEN 479, NRES 879, METR 879**Prerequisites:** NRES 208 or METR 100 or METR/NRES 370.**Notes:** Offered spring semester of even-numbered calendar years.**Description:** Interaction between earth's climate and the hydrologic cycle. Energy and water fluxes at the land-atmosphere interface. Atmospheric moisture transport, precipitation, evaporation, snowmelt, and runoff. Impacts of climate variability and change on the hydrologic cycle.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 889 Seminar I****Crosslisted with:** AGEN 889**Description:** Introduction into departmental and campus resources, professionalism, preparation and delivery of presentations, technical writing, and additional topics as arranged by enrolled students.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

BSEN 892 Special Topics**Crosslisted with:** BSEN 492**Prerequisites:** Permission**Description:** Subject matter in emerging areas of Biological Systems Engineering not covered in other courses within the curriculum. Topics, activities, and delivery methods vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**BSEN 896 Special Problems****Crosslisted with:** AGEN 896**Prerequisites:** Permission**Description:** Investigation and written report on engineering problems not covered in sufficient depth through existing courses. Topic varies by semester.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**BSEN 897 Masters Project****Crosslisted with:** AGEN 897, MSYM 897**Prerequisites:** Admission to M.S. in Agricultural and Biological Systems Engineering or M.S. in Mechanized Systems Management, and permission of major advisor**Notes:** Intended for students who are pursuing an Option II or III master's degree in Agricultural and Biological Systems Engineering, or Mechanized Systems Management.**Description:** Conception, design, development, and completion of a project that requires data collection, synthesis, analysis of results, and the development of a final written report that will be defended in the final oral examination.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**BSEN 898 Internship****Crosslisted with:** AGEN 898**Prerequisites:** Permission**Notes:** Students required to write an internship report of their creative accomplishments after completion of the internship. Students may spend up to nine months at the cooperating partner's workplace.**Description:** Solution of engineering or management problems through a non-academic experience within the private sector or a government agency. The experience entails all or some of the following: research, design, analysis, and testing on an engineering problem. A plan, which documents how the individual will demonstrate creativity during the internship must be approved prior to the internship.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**BSEN 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**BSEN 912 Advanced Ultrasound Imaging****Prerequisites:** BSEN 311 or ELEC 304 Engineering design and analysis of medical ultrasound applications**Description:** Beamforming, diffraction, wave space, scattering, imaging. Interactions of mechanical energy and tissue. Linear and phased arrays. Doppler estimation of blood flow velocity. Tumor and cyst characterization. Other modern research topics in medical ultrasound.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 935 Analysis of Engineering Properties of Biological Materials****Prerequisites:** BSEN 846 or equivalent**Description:** Current and relevant mechanical, rheological, thermal, electrical, and optical properties as related to the engineering of processing, storage, handling, and utilization systems for biological materials are selected for analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 941 Agricultural Waste Management****Crosslisted with:** AGEN 941**Prerequisites:** Permission**Description:** Aerobic, anaerobic, and physical-chemical treatment, energy recovery and protein synthesis processes for high-strength organic materials; agricultural applications including composting, ammonia stripping, nitrification, denitrification, and land disposal of organic and chemically treated materials.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 943 Bioenvironmental Engineering****Prerequisites:** MATH 821**Description:** An engineer analysis of livestock, their environment and the interaction between the two; mathematical models, heat transfer, energy balances, environmental measurements, physiological measurements, calorimetry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 951 Advanced Mathematical Modeling in Biological Engineering****Description:** Advanced mathematical modeling techniques and applications. Specific topics from current literature and vary depending on research interests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BSEN 954 Turbulent Transfer in the Atmospheric Surface Layer**Crosslisted with:** NRES 954**Prerequisites:** MATH 821; MECH 310 or NRES 808 or BIOS 857; or equivalent**Notes:** Offered spring semester of odd-numbered calendar years.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BSEN 957 Modeling Vadose Zone Hydrology****Crosslisted with:** AGEN 957, CIVE 957, GEOL 957**Prerequisites:** MATH 221/821 or equivalent. AGEN/BSEN 350 or NRES 453/853 or equivalent.**Notes:** Typically offered spring semester in even years.**Description:** Principles and modeling of fluid flow and solute transport in the vadose zone. Topics include hydraulic properties of variably saturated media, application of Darcy's Law in variably saturated media, hydrologic and transport processes in the vadose zone, and solution of steady and unsteady flow problems using numerical techniques including finite element methods. Contemporary vadose zone models will be applied to engineering flow and transport problems. Review and synthesis of classic and contemporary research literature on vadose zone hydrology will be embedded in the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**BSEN 989 Seminar II****Crosslisted with:** AGEN 989**Description:** Developing a graduate program, orientation to research, grant and research proposal preparation, experimental design and analysis, manuscript preparation and review, preparations and delivery of technical presentations, and research management.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**BSEN 998 Advanced Topics****Crosslisted with:** AGEN 998**Prerequisites:** Permission**Description:** Individual study in advanced engineering topics that are not covered in regular course work or thesis. Topic varies by term.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**BSEN 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Biomedical Engineering (BIME)

BIME 999 Doctoral Dissertation**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Broadcasting (BRDC)

BRDC 828 Advanced Television Production**Crosslisted with:** BRDC 428**Prerequisites:** BRDC 228**Description:** Theory of visualization for television. Practical application of directing techniques. Programs analyzed in relation to translation of facts, ideas, emotions and attitudes through television. Program production experience in the studios of the university station, KUON-TV.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 833 Digital Motion Graphics****Crosslisted with:** BRDC 433**Prerequisites:** Upper class standing and successful completion of JOMC 130-134.**Description:** Creating digital motion graphics and animation using compositing and animation software. Covers project creation, techniques, workflow management, and related post-production work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LAB**BRDC 854 Broadcast Management****Crosslisted with:** BRDC 454**Prerequisites:** Senior standing and major in broadcasting**Description:** Organizational and management procedures as they relate to the telecommunications media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 855 Broadcast Programming****Crosslisted with:** BRDC 455**Prerequisites:** Senior standing and major in broadcasting**Description:** Radio and television program philosophies and formats with emphasis on regulations, responsibilities, economics and audience measurement procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

BRDC 856 Cable Telecommunications**Crosslisted with:** BRDC 456**Prerequisites:** BRDC 228**Description:** Development of cable telecommunications systems and relevant regulatory aspects of cable development. Current and future projections of cable systems management systems-satellites, teletext, interactive, access channels, importation, origination, pay cable.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 861 Instructional Television****Crosslisted with:** BRDC 461**Prerequisites:** Senior standing in broadcasting**Description:** Preparation of instructional television programs. Historical development of television as an instructional medium, learning and communication theory relevant to proper applications of televised instruction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 862 Advanced Production****Crosslisted with:** BRDC 462**Prerequisites:** BRDC 228, BRDC 359 and BRDC 360**Notes:** Capstone course in the production track.**Description:** Produce multiple long-form, edited television programs to be distributed to a mass audience. Directing a weekly, live, thirty-minute television studio newscast. Advanced operation of studio equipment, graphics software and non-linear editing equipment. Prepare demo materials for a professional portfolio.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**BRDC 865 International Broadcasting****Crosslisted with:** BRDC 465**Prerequisites:** Senior standing in broadcasting or international studies**Description:** Development of programming patterns and controls as well as cultural consideration of national and international systems of broadcasting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 866 Telecommunication and Information Systems****Crosslisted with:** BRDC 466**Prerequisites:** Permission of department head**Description:** The telephone industry, voice and data communication and networking systems. Explores the development and structure of telecommunications, issues, services, applications, technology and management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 869 Advanced Cinematography/Videography****Crosslisted with:** BRDC 469**Prerequisites:** BRDC 359 and 371.**Notes:** Continuation of BRDC 359 and 371.**Description:** Production of single and double system sound films. Production of videotapes for television.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 872 Advanced Reporting****Crosslisted with:** BRDC 472**Prerequisites:** BRDC 369 or BRDC 371, BRDC 370, and JOUR 202.**Notes:** Capstone course in the news track.**Description:** Produce multiple live weekly newscasts with anchors (news, sports, entertainment, social media) to be distributed to a mass audience. Advanced reporting skills, knowledge of graphics software and non-linear editing equipment. Prepare demo materials for a professional portfolio.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**BRDC 873 Broadcast Documentary****Crosslisted with:** BRDC 473**Prerequisites:** Senior standing in broadcasting; BRDC 472.**Description:** Depth reporting and advanced production techniques necessary for the preparation of a broadcast documentary program.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 874 Advanced Broadcast Writing****Crosslisted with:** BRDC 474**Prerequisites:** Senior standing**Description:** Techniques of planning, preparing and writing radio, television and motion picture scripts including announcements, interviews, talk programs, features, editorials, investigative reports and dramatic adaptations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**BRDC 891 Special Topics****Crosslisted with:** BRDC 491**Notes:** 12 hours max special topics hours at all levels (100, 200, 300, 400) per degree. May be repeated up to three times so long as the topics are different.**Description:** Topics vary each term.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC

Chemical and Biomolecular Engineering (CHME)

CHME 805 Multiple Contact Separation Processes

Prerequisites: CHME 823 and permission

Description: Application of the principles of physical kinetics and the equilibrium stage to separation processes such as absorption, extraction, and distillation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHME 812 Introduction to Atomistic Simulations

Crosslisted with: CHME 412

Prerequisites: Senior standing

Description: Theory and application of quantum-based computational methods used to model, predict and analyze materials properties.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHME 815 Advanced Chemical Engineering Analysis

Prerequisites: CHME 833, MATH 820 or MATH 821

Description: Application of advanced mathematics to chemical engineering design, with emphasis upon the derivation of differential equations describing physical situations as well as upon the solution of these equations. Design methods for tubular and stirred tank reactors, ion exchange units, pebble heaters, gas absorbers, mixers, etc.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CHME 845

CHME 823 Chemical Engineering Thermodynamics and Kinetics

Crosslisted with: CHME 323

Prerequisites: CHME 223

Description: Application to multi-component systems; thermodynamics, phase equilibria, chemical reaction equilibria, and process analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CHME 324; CHME 805; CHME 825; CHME 845; CHME 847, CHME 447; CHME 935; CHME 995

CHME 825 Theoretical and Applied Thermodynamics for Chemical Engineers

Prerequisites: CHME 823 or CHEM 982, MATH 820 or 821 or equivalent

Description: Application of classical engineering and chemical thermodynamics to problems in chemical engineering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHME 830 Chemical Engineering Laboratory II

Crosslisted with: CHME 430

Prerequisites: CHME 330; CHME 442 or parallel; CHME 462 or parallel. Parallel: CHME 460.

Description: Selected experiments in chemical engineering. Emphasis on experimental design, interpretation of results, and formal oral and written presentation.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LAB

CHME 832 Transport Operations I

Crosslisted with: CHME 332

Prerequisites: MATH 208; CHME 223

Description: Mass, momentum and energy transport phenomena and their application in chemical engineering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGEN 325, BSEN 325; AGEN 344, BSEN 344; CHME 330; CHME 333, CHME 833; CHME 420; CHME 835

CHME 833 Transport Operations II

Crosslisted with: CHME 333

Prerequisites: CHME 832

Description: Continuation of CHME 332/832.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CHME 475, CHME 875; CHME 815; CHME 835; CHME 935; CHME 995

CHME 834 Diffusional Operations

Crosslisted with: CHME 434

Prerequisites: CHME 332

Description: Application of diffusional theory to the design of processing equipment required for absorption, adsorption, leaching, drying, and chemical reactions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHME 835 Transport Phenomena I

Prerequisites: MATH 821; CHME 832 and CHME 833 or equivalent

Description: Advanced consideration of molecular and turbulent momentum, energy and mass transport.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CHME 836; CHME 845; CHME 925

CHME 836 Transport Phenomena II

Prerequisites: CHME 835

Description: Continuation of Transport Phenomena I.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHME 842 Chemical Reactor Engineering and Design**Crosslisted with:** CHME 442**Prerequisites:** CHME 323.**Description:** Basic principles of chemical kinetics are coupled with models descriptive of rates of energy and mass transfer for the analysis and design of reactor systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 845**CHME 845 Advanced Chemical Engineering Kinetics****Prerequisites:** CHME 815, CHME 823, CHME 835, CHME 842**Description:** Kinetics of chemical reactions in several categories of reactors for interpretation of experimental data and design of equipment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 847 Principles and Applications of Catalysis in Reaction Engineering****Crosslisted with:** CHME 447**Prerequisites:** CHME 323.**Description:** Principles and applications of heterogeneous catalysis, mechanisms, catalytic reactor types and catalyst characterization and performance. Case studies on current catalytic technologies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 852 Chemical Engineering Process Economics and Optimization****Crosslisted with:** CHME 452**Prerequisites:** CHME 333, CHME 331, CHME 434**Notes:** Credit toward the degree may be earned only in CHME 452/852**Description:** Criteria of chemical process economics: cost and asset accounting, time value of money, profitability, alternative investments, minimum attractive rate of return, sensitivity and risk analysis. Process optimization in: plant operations, unit operations, using successive calculations, linear programming and dynamic programming.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 453, CHME 853**CHME 853 Chemical Engineering Process Design and Safety****Crosslisted with:** CHME 453**Prerequisites:** CHME 452**Description:** Design, evaluation, and safety considerations of chemical engineering process applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 854 Chemical Process Engineering****Crosslisted with:** CHME 454**Prerequisites:** CHME 430 and 312.**Description:** Practical and theoretical aspects of chemical process analysis, simulation, and synthesis. Case studies used to illustrate principles. Use of the digital computer as a tool of the process engineer is stressed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 860 Automatic Process Control Laboratory****Crosslisted with:** CHME 460**Prerequisites:** CHME 462 or parallel. Parallel: CHME 430.**Description:** Selected laboratory experiments to demonstrate the theory of the dynamics and control of chemical processes.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**CHME 862 Automatic Process Control****Crosslisted with:** CHME 462**Prerequisites:** MATH 221, CHME 333.**Description:** Analysis and design of automatic control systems. Dynamic responses of measuring instruments, control elements, stability of control systems, and process equipment included in control loops.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 965**CHME 873 Biochemical Engineering****Crosslisted with:** CHME 473**Prerequisites:** CHEM 262, CHEM 431**Description:** Dynamics of microbial growth and death. Engineering processes for microbiological synthesis of cellular materials and industrial products, with emphasis on food and pharmaceutical production by bacteria and fungi.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 470; CHME 474, CHME 874**CHME 874 Advanced Biochemical Engineering****Crosslisted with:** CHME 474**Prerequisites:** CHME 473/873.**Description:** Recent theoretical and technical developments in biochemical engineering.**Credit Hours:** 2-6**Min credits per semester:** 2**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

CHME 875 Biochemical Separations**Crosslisted with:** CHME 475**Prerequisites:** CHME 333/833**Description:** Separation and purification of compounds of biological origin from an analytical perspective. Application of unit operations for these separations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 876 Micro/Nano systems for Engineering and Life Sciences****Crosslisted with:** CHME 476**Prerequisites:** Senior standing.**Description:** Introduction to a number of biological problems facing living systems and show how micro/nanotechnology is being used to solve those problems. Emphasis on engineering perspectives of the life sciences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 877 Molecular Bioengineering****Crosslisted with:** CHME 477**Prerequisites:** Senior standing.**Description:** Introduction to fundamentals and up-to-date developments in the field of bioengineering at the molecular level. Topics to cover include recombinant DNA methods, protein engineering, microbial cell factories, synthetic and systems biology, DNA and protein therapeutics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**CHME 882 Polymers****Crosslisted with:** CHME 482**Prerequisites:** CHEM 262 and 264.**Description:** Introduction to polymer technology stressing polymerization kinetics, methods of resin manufacture and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 886 Electrochemical Engineering****Crosslisted with:** CHME 486**Prerequisites:** CHME 333, and CHME 442, or MECH 310 and MATL 360.**Description:** Thermodynamic and kinetic principles of electrochemistry are applied to the design and analysis of electrochemical processes, including chemical production, batteries, fuel cells, and corrosion prevention.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 889 Air Pollution, Assessment and Control****Crosslisted with:** CHME 489**Prerequisites:** Senior standing.**Description:** Survey of the present status of the air pollution problem and the application of engineering and scientific principles to its practical and effective coordinated control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 896 Advanced Topics in Chemical Engineering Computation****Crosslisted with:** CHME 496**Prerequisites:** CHME 312 or CSCE 455/855 or MECH 480/880, and permission.**Description:** Intensive treatment of special topics of current research interest in such areas as steady-state and dynamic process simulation, design optimization, chemical process synthesis, computer-aided product research, stochastic optimization, and numerical methods applied to transport problems.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**Prerequisite for:** CHME 915**CHME 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**CHME 900 Seminar in Chemical Engineering****Description:** Discussion of research projects and review of current literature in chemical engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Format:** LEC**CHME 915 Systems Analysis in Chemical Engineering****Prerequisites:** CHME 496/896**Description:** Computational methods of process optimization. Techniques of process systems analysis and their application in digital simulators. Process simulation in the presence of uncertainty.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 925 Transport Properties****Prerequisites:** CHME 835, CHEM 882**Description:** Application of the kinetic theories of gases, liquids, and solids to the prediction and correlation of transport properties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CHME 935 Membrane Principles and Processes**Prerequisites:** CHME 823 and CHME 833**Description:** Fundamental principles relating to membrane effects, the structure and properties of membranes, and applications in electrodialysis, ultrafiltration, diffusion control, artificial organs, and other processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 965 Advanced Process Dynamics and Control****Prerequisites:** CHME 862**Description:** Transient behavior of typical industrial processes and systems-heat exchangers, dryers, distillation columns, absorbers, chemical reactors, etc.-emphasis on the control of such processes. Introduction to systems engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHME 995 Special Problems in Chemical Engineering****Prerequisites:** CHME 823, CHME 833 or equivalent**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**CHME 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Chemistry (CHEM)

CHEM 821 Analytical Chemistry**Crosslisted with:** CHEM 421**Prerequisites:** CHEM 471/871 or CHEM 481/881; parallel CHEM 423/823**Description:** Chemical and physical properties applied to quantitative chemical analysis. Solution equilibria, stoichiometry, and instrumental theory and techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 423, CHEM 823; CHEM 824; CHEM 825A; CHEM 825B; CHEM 825D; CHEM 825E; CHEM 825G; CHEM 825J; CHEM 991A**CHEM 823 Analytical Chemistry Laboratory****Crosslisted with:** CHEM 423**Prerequisites:** CHEM 421/821 or parallel.**Notes:** It is suggested that CHEM 423 be taken parallel with CHEM 421.**Description:** Lab designed to accompany CHEM 421/821. Applications of analytical chemical principles to laboratory problems.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** CHEM 421, CHEM 821**CHEM 824 Applied Problems in Analytical Chemistry****Prerequisites:** CHEM 821**Description:** Selection and execution of analytical methods in the solution of typical academic and industrial chemical problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 825A; CHEM 825B; CHEM 825D; CHEM 825E; CHEM 825G; CHEM 825J; CHEM 991A**CHEM 825A Ionic Equilibria****Prerequisites:** or parallel: CHEM 821 or 824**Description:** Survey of theory of ionic equilibrium systems of importance in chemical analysis.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CHEM 825B Electrochemical Methods****Prerequisites:** CHEM 821 or 824**Description:** Survey of principles and applications of electroanalytical chemistry.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 825D Mass Spectrometry****Prerequisites:** CHEM 821 or 824**Description:** Survey of the fundamentals (1 cr) and applications (1 cr) of mass spectrometry.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 825E Data Handling****Prerequisites:** or parallel: CHEM 821 or 824**Description:** Application of statistical, graphical and numerical methods for the treatment of analytical chemical data.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

CHEM 825G Chromatographic Separations

Prerequisites: CHEM 821 or 824

Description: Survey of principles and applications of modern chromatographic analysis.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 825J Optical Methods of Analysis

Prerequisites: CHEM 821 or 824

Description: Survey of principles and analytical application of modern optical spectrometric methods.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 831 Structure and Metabolism

Crosslisted with: BIOC 431, BIOC 831, BIOS 431, BIOS 831, CHEM 431

Prerequisites: LIFE 120 with a grade of C or better; CHEM 252 or CHEM 262 with a grade of C or better.

Notes: BIOS 206 or AGRO 215 is recommended. First course of a two-semester, comprehensive biochemistry course sequence.

Description: Structure and function of proteins, nucleic acids, carbohydrates and lipids; nature of enzymes; major metabolic pathways of catabolism; and biochemical energy production.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

Prerequisite for: AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; AGRO 810, BIOC 810, HORT 810; ASCI 820; ASCI 917; ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927; BIOC 305; BIOC 432, BIOC 832, BIOS 432, CHEM 432, CHEM 832, BIOS 832; BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833; BIOS 879; BIOS 950, VBMS 950; BSEN 416, BSEN 816; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; VBMS 410; VBMS 805

CHEM 832 Metabolism and Biological Information

Crosslisted with: BIOC 432, BIOC 832, BIOS 432, CHEM 432, BIOS 832

Prerequisites: BIOC 431/831 with a grade of C or better; BIOS 206 or AGRO 215 with a grade of C or better.

Notes: Continuation of BIOC 431/831.

Description: Major metabolic pathways of anabolism, structural and biochemical aspects of biological information flow and use in biotechnology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ASCI 949, BIOC 949, BIOS 949, NUTR 949; BIOC 435; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 934, BIOS 934, CHEM 934; BIOC 935, BIOS 935, CHEM 935; BIOC 992K, CHEM 992K; BIOC 998; BIOS 950, VBMS 950; VBMS 919; VBMS 951

CHEM 833 Biochemistry Laboratory

Crosslisted with: BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433

Prerequisites: BIOC 431/831 or parallel; or CHEM 435/835.

Description: Introduction to techniques used in biochemical and biotechnology research, including measurement of pH, spectroscopy, analysis of enzymes, chromatography, fractionation of macromolecules, electrophoresis, and centrifugation.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Offered: FALL/SPR

Prerequisite for: BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898; CHEM 498

CHEM 834 Plant Biochemistry

Crosslisted with: AGRO 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834

Prerequisites: BIOC/BIOS/CHEM 431/831.

Description: Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHEM 835 Chemical Biology

Crosslisted with: CHEM 435

Prerequisites: CHEM 252 or 262, and CHEM 221

Notes: Credit toward the undergraduate or graduate degree cannot be earned in both CHEM 435/835 and 431/831 and/or CHEM 432/832 or their equivalents.

Description: Fundamentals of chemical biology with an emphasis on the underlying principles of biomolecular structures, macromolecular-small molecule interactions, including mechanistic aspects of enzymes and cofactors, use of modified enzymes to alter biochemical pathways, and the use of chemical tools for understanding biological processes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833

CHEM 836 Physical Basis of Macromolecular Function

Crosslisted with: BIOC 836

Description: Introduction to the theory and practice of biophysical characterization of macromolecules. The course will be based on primary research literature, although a supporting text will be used for in depth discussion of the methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHEM 841 Inorganic Chemistry**Crosslisted with:** CHEM 441**Prerequisites:** CHEM 221 with a minimum grade of C; CHEM 252 or 262.**Notes:** CHEM 443 is recommended to be taken parallel.**Description:** CHEM 441/841 and the accompanying lab course, CHEM 443/843, constitute a basic course in inorganic chemistry. Structure, bonding, properties, and reactions of inorganic compounds with emphasis on the relationships and trends that are embodied in the periodic table of the elements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 421, CHEM 821; CHEM 845**CHEM 843 Inorganic Chemistry Laboratory****Crosslisted with:** CHEM 443**Prerequisites:** CHEM 252 or 262, and 264; parallel: CHEM 841**Notes:** It is suggested that CHEM 443 be taken in parallel with CHEM 441.**Description:** Introduction to typical inorganic chemistry laboratory techniques through the preparation and characterization of inorganic compounds.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** CHEM 845**CHEM 845 Modern Inorganic Chemistry****Prerequisites:** CHEM 841, 843, and 882**Description:** Topics in inorganic chemistry such as bioinorganics, catalysis, organometallic, materials and solid state chemistry. Theoretical principles and practical applications, and on correlating the physical and chemical properties of the chemical elements and inorganic chemical compounds.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 943; CHEM 945; CHEM 991B**CHEM 848 Redox Biochemistry****Crosslisted with:** BIOC 848**Prerequisites:** 3 hrs BIOC and 3 hrs inorganic chemistry**Description:** Redox (oxidation and reduction)-based biochemical processes (energy generation, oxygen transfer, enzyme catalysis, signaling, gene regulation, and diseases). Recent progress in these areas. Roles of metals in biochemical reactions, metal homeostasis, and biosynthesis of metal cofactors and metal sites. Biochemistry and pathophysiology of redoxactive species and radicals. Antioxidant molecules and enzymes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 855 Advanced Organic Chemistry****Prerequisites:** CHEM 252 or 262 or equivalent**Description:** Survey of modern concepts of structure/bonding, acidity/basicity, stereochemistry, and reaction mechanisms. Introduction to the fundamental tools used to investigate reaction mechanism (transition state theory, elementary Huckel theory, linear free energy relationships, rate laws and kinetic isotope effects). Mechanistic examples emphasize the major classes of organic reactions, particularly concerted, carbanionic and carbocationic. Development of reasoning skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 865A; CHEM 865B; CHEM 865E; CHEM 952; CHEM 953; CHEM 954; CHEM 964; CHEM 991E**CHEM 863 Advanced Organic Preparations****Crosslisted with:** CHEM 463**Prerequisites:** CHEM 252 and CHEM 254.**Notes:** For students who wish additional laboratory work in organic chemistry.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** LAB**CHEM 865A Organic Reactions****Prerequisites:** CHEM 855**Description:** Modern reactions and methodology for organic synthesis. Carbon-carbon bond-forming reactions; alkene synthesis; oxidation; reductions; function group interconversion; use of protecting groups; and organometallic reagents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 865B Advanced Organic Reactions****Prerequisites:** CHEM 855 and permission**Description:** Additional reactions of importance for organic synthesis. Examples of topics which may be covered include cycloadditions, rearrangements, and radical-based transformations.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CHEM 865E Bioconjugate Reactions****Prerequisites:** CHEM 855 and permission**Description:** Organic reactions of particular relevance to interdisciplinary research in analytical/bioanalytical chemistry, biochemistry, and the life sciences. Formation of esters, thioesters, and amides; surface functionalization of inorganic or polymer supports; methods for cross-linking, conjugation, or immobilization of chemicals and biomolecules.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

CHEM 871 Physical Chemistry**Crosslisted with:** CHEM 471**Prerequisites:** CHEM 221; MATH 107; and PHYS 142 or 212.**Notes:** Credit may not be earned in both CHEM 471/871 and CHEM 481/881.**Description:** Conceptual and mathematical foundations of classical and statistical thermodynamics. Applications of thermodynamics to phase and chemical equilibria. Thermodynamics of solutions of small molecules and of polymers. Biological applications of thermodynamics. Introduction to chemical and biochemical spectroscopy.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOC 486, BIOC 886, BIOS 486, BIOS 886, CHEM 486, CHEM 886; CHEM 421, CHEM 821**CHEM 874 Topics in Chemical Pedagogy****Crosslisted with:** TEAC 874**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**CHEM 874A Topics in Chemical Pedagogy - Green Chemistry****Crosslisted with:** TEAC 874A**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874D Topics in Chemical Pedagogy - Demonstrations for High School Chemistry****Crosslisted with:** TEAC 874D**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874E Topics in Chemical Pedagogy - Experiments for High School Chemistry****Crosslisted with:** TEAC 874E**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874J Topics in Chemical Pedagogy - Developing a Safety Culture****Crosslisted with:** TEAC 874J**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CHEM 874K Topics in Chemical Pedagogy - Chemistry of Life Processes: Biomolecules****Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874L Topics in Chemical Pedagogy - Addressing Misconceptions****Crosslisted with:** TEAC 874L**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CHEM 874M Topics in Chemical Pedagogy - Mathematics Integration**Crosslisted with:** MATH 874M, TEAC 874M**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. May be counted towards the MAT and MScT degrees in mathematics and statistics, not the MA, MS, or PhD. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874N Topics in Chemical Pedagogy - Inquiry Strategies****Crosslisted with:** TEAC 874N**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874P Topics in Chemical Pedagogy - Chemistry in the Workplace****Crosslisted with:** TEAC 874P**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 874Y Topics in Chemical Pedagogy - Graphing Calculator Activities****Crosslisted with:** TEAC 874Y**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 875 Chemical Pedagogy in the High School Laboratory****Crosslisted with:** TEAC 875**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 875A Chemical Pedagogy in the High School Laboratory - Small-scale Experiments****Crosslisted with:** TEAC 875A**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 875B Chemical Pedagogy in the High School Laboratory - Technology Integration****Crosslisted with:** TEAC 875B**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**CHEM 875E Chemical Pedagogy in the High School Laboratory - Inquiry Experiments****Crosslisted with:** TEAC 875E**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 875K Chemical Pedagogy in the High School Laboratory - At-home Experiments****Crosslisted with:** TEAC 875K**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CHEM 875P Chemical Pedagogy in the High School Laboratory - Probe Experiments**Crosslisted with:** TEAC 875P**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 875T Chemical Pedagogy in the High School Laboratory - Traditional Experiments****Crosslisted with:** TEAC 875T**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 881 Physical Chemistry I****Crosslisted with:** CHEM 481**Prerequisites:** CHEM 221 with grade of at least C; MATH 208; PHYS 212.**Notes:** Credit may not be earned in both CHEM 471/871 and CHEM 481/881.**Description:** CHEM 481/881 and 482/882 with accompanying lab 484/884 form a continuous basic course in physical chemistry for students interested in chemistry as a profession. Introduction to quantum mechanics and statistical mechanics; application to problems in atomic and molecular structure and to spectroscopy.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOC 486, BIOC 886, BIOS 486, BIOS 886, CHEM 486, CHEM 886; CHEM 482, CHEM 882; CHEM 484, CHEM 884; CHEM 484A, CHEM 884A; CHEM 991J; PHYS 422, PHYS 822, ECEN 422, ECEN 822**CHEM 882 Physical Chemistry II****Crosslisted with:** CHEM 482**Prerequisites:** CHEM 481/881.**Notes:** This course should parallel CHEM 484/884. Continuation of CHEM 481/881.**Description:** Thermodynamics and statistical mechanics and their application to the study of solids, liquids, gases, solutions, phase equilibria, and chemical equilibria. Chemical kinetics and reaction dynamics.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** CHEM 484, CHEM 884; CHEM 484A, CHEM 884A; CHEM 845; CHEM 987A; CHEM 987B; CHEM 991J; CHME 925**CHEM 884 Physical Chemical Measurements****Crosslisted with:** CHEM 484**Prerequisites:** CHEM 481/881; CHEM 482/882 or parallel.**Notes:** It is suggested that CHEM 484/884 be taken in parallel with CHEM 482/882.**Description:** Applications of physical measurements and principles to study chemical systems and processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 884A Physical Chemical Measurements****Crosslisted with:** CHEM 484A**Prerequisites:** CHEM 481/881; CHEM 482/882 or parallel.**Notes:** It is suggested that CHEM 484A/884A be taken in parallel with CHEM 482/882.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 885 Survey of Modern Physical Chemistry****Description:** A one-semester survey course in modern physical chemistry, covering chemical thermodynamics, chemical kinetics, quantum chemistry, molecular structure and spectroscopy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 943; CHEM 972; CHEM 982; CHEM 983; CHEM 984; CHEM 987A; CHEM 987B; CHEM 991J**CHEM 886 Advanced Topics in Biophysical Chemistry****Crosslisted with:** BIOC 486, BIOC 886, BIOS 486, BIOS 886, CHEM 486**Prerequisites:** CHEM 471/871 or CHEM 481/881.**Description:** Applications of thermodynamics to biochemical phenomena, optical properties of proteins and polynucleotides, and kinetics of rapid reactions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CHEM 898 Special Problems****Prerequisites:** Permission**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**CHEM 898A Introduction to Graduate Research****Prerequisites:** Admission to chemistry graduate program.**Description:** Series of lectures and activities designed to prepare for graduate research and graduate studies in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CHEM 898B Research Update Interview

Description: Preparation for and presentation of the Research Update Interview. Open to graduate students in Chemistry in the third semester of their program, or with instructor permission.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: IND

CHEM 898E Original Proposal Oral

Description: Preparation for and presentation of an Original Research Proposal. Open to graduate students in Chemistry in the sixth semester of their program, or with instructor permission.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: IND

CHEM 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

CHEM 932 Proteins

Crosslisted with: BIOC 932, BIOS 932

Prerequisites: BIOC/BIOS/CHEM 832 or BIOC/BIOS/CHEM 839

Description: Protein structure and function.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 933 Enzymes

Crosslisted with: BIOC 933, BIOS 933

Prerequisites: BIOC/BIOS/CHEM 432/832, or BIOC/BIOS/CHEM 839

Description: Kinetics regulation and reaction mechanisms of enzymes.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 934 Genome Dynamics and Gene Expression

Crosslisted with: BIOC 934, BIOS 934

Prerequisites: BIOC/BIOS/CHEM 832

Description: Detailed examination of dynamic control mechanisms of genome maintenance and gene regulation. Mechanisms of transcription, translation, and replication based on analysis of current and seminal literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHEM 935 Metabolic Function and Dysfunction

Crosslisted with: BIOC 935, BIOS 935

Prerequisites: BIOC/CHEM/BIOS 432/832 and permission

Description: Current metabolic research at the bioenergetic, metabolomic, and molecular level. The normal metabolic processes that go awry in cancer, obesity, and oxidative stress.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHEM 936 Molecular Biology Methods

Prerequisites: CHEM 431/831, or CHEM 835, or with instructor permission

Description: The fundamentals of molecular biology and biotechnology and applications. The fundamentals include methods for DNA cloning, sequencing, annotation, recombination, mutagenesis, and expression. The applications include the production of molecular diagnostics and therapeutic agents etc. with a focus on the molecular biotechnology of microbial systems.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CHEM 943 Solid-State Chemistry

Prerequisites: CHEM 845 and 885

Description: Advanced course dealing with the structure, bonding, properties, and reactions of inorganic solid materials.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 945 Advanced Inorganic Chemistry

Prerequisites: CHEM 845

Description: Chemistry of the metallic compounds.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 946 Organometallic Chemistry

Description: The chemistry of compounds that occupy the boundary between inorganic and organic chemistry.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 952 Stereochemistry of Organic Compounds

Prerequisites: CHEM 855

Description: Types of stereoisomerism in organic compounds. Steric strain and certain other steric effects in reactions of organic substances.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

CHEM 953 Organic Reaction Mechanisms**Prerequisites:** CHEM 855**Description:** Classes of reaction mechanisms and the methods whereby mechanisms may be studied. Kinetic and equilibrium studies; isotopic labeling; activation parameters; linear free energy relationships; stereochemistry; NMR and other spectroscopic methods as applied to reaction mechanisms, including direct observation of reactive intermediates; interpreting the results of semi-empirical calculations of reaction pathways; and studies of acid- and base-catalysis mechanisms.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**CHEM 954 Physical Organic Chemistry****Prerequisites:** CHEM 855**Description:** Elementary aspects of molecular orbital (MO) theory. Selected concepts in molecular symmetry and topology. Applications of MO calculations to reaction mechanisms and elucidation of electronic structure for organic molecules: calculations vs. experiment. Introduction to selected interdisciplinary topics.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**CHEM 963 Metals in Organic Synthesis****Prerequisites:** CHEM 865**Description:** Use of organometallic reagents and catalysts in organic synthesis.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**CHEM 964 Bioorganic Chemistry****Prerequisites:** CHEM 855**Description:** Organic chemistry of biological systems with particular emphasis on the molecular mechanisms of action of enzymes and their associated cofactors.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**CHEM 965 Advanced Synthetic Strategy****Prerequisites:** CHEM 865**Description:** Strategy and execution of organic synthesis. Retrosynthetic analysis; total synthesis of natural and unnatural products; methods for asymmetric synthesis; and applications of pericyclic reactions.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**CHEM 972 Quantum Chemistry I****Prerequisites:** CHEM 885**Description:** Basic principles of quantum mechanics applied to problems in molecular structure and chemical bonding.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 987A; CHEM 987B**CHEM 982 Chemical Thermodynamics****Prerequisites:** CHEM 885**Description:** Principles of thermodynamics, with applications to chemical systems and processes, and illustrations from current literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHEM 983; CHEM 984; CHME 825**CHEM 983 Statistical Thermodynamics****Prerequisites:** CHEM 885 or 982**Description:** Application of equilibrium statistical mechanics to problems of chemical interest. Calculation of thermodynamic functions from molecular structure data. Molecular theories of gases, liquids, and solutions.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 984 Chemical Kinetics****Prerequisites:** CHEM 885 or 982**Description:** Concepts and equations; successive, competing, and reversible reactions; equilibrium, collision, and activated-complex theories; reaction mechanism; heterogeneous reactions; current literature.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 987A Molecular Spectroscopy****Prerequisites:** CHEM 482/882 or 885 or 972; and permission.**Description:** A quantitative treatment of the principal methods of electronic, optical, and magnetic resonance spectroscopy.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**CHEM 987B Scattering****Prerequisites:** CHEM 482/882 or 885 or 972; and permission.**Description:** A quantitative treatment of the principal methods of light, electron and neutron scattering.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC

CHEM 990 Seminar in Chemistry

Description: CHEM 990 consists of monthly lectures presented by guest speakers from other colleges and universities, the government, and industry. Registration in CHEM 990 is required of all full-time CHEM graduate students. Current topics of chemical interest.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 5

Format: LEC

CHEM 991A Selected Topics in Analytical Chemistry

Prerequisites: CHEM 821 or 824, or parallel

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 991B Special Topics in Inorganic Chemistry

Prerequisites: CHEM 845 and permission

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 991E Special Topics in Organic Chemistry

Prerequisites: CHEM 855

Description: Topics of special interest in modern organic chemistry.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

CHEM 991J Special Topics in Physical Chemistry

Prerequisites: CHEM 881 and 882, or 885

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 992A Graduate Seminar in Analytical/Bioanalytical Chemistry

Prerequisites: Graduate student enrollment in Chemistry, or permission

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 992E Graduate Seminar in Organic Chemistry/Chemical Biology

Prerequisites: Graduate student enrollment in Chemistry, or permission

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 992J Graduate Seminar in Physical/Inorganic/Materials Chemistry

Prerequisites: Graduate student enrollment in Chemistry, or permission.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CHEM 992K Seminar in Biological Chemistry

Crosslisted with: BIOC 992K

Prerequisites: BIOC 832 or 839; and permission

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

CHEM 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Child, Youth and Family Studies (CYAF)

CYAF 804A Family and Consumer Sciences Methods

Prerequisites: Admission to CYAF degree program and permission

Notes: Distance education course delivered by Central Washington State University.

Description: The analysis and development of curriculum and methods of teaching Family and Consumer Sciences (FCS) in the context of the National Standards for FCS students, the National Standards for teachers of FCS and the standards for the state in which the candidate will teach. Learners and the learning environment; program leadership; beginning instructional strategies; Family, Career, and Community Leaders of America (FCCLA); curriculum development; integration of technology in the FCS classroom; and assessment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 804B Family and Consumer Sciences Methods II

Prerequisites: Admission to CYAF graduate program and permission.

Notes: Distance education course delivered by Texas Tech University.

Description: Development of curriculum and methods of teaching Family and Consumer Sciences (FCS) in the context of the National Standards for FCS students, the National Standards for teachers of FCS and the standards for the state in which the candidate will teach. Learners and the learning environment; program leadership; beginning instructional strategies; Family, Career, and Community Leaders of America (FCCLA); curriculum development; integration of technology in the FCS classroom and assessment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 805 Administration in Family and Consumer Sciences Education**Prerequisites:** Admission to CYAF graduate program**Description:** Administration of family and consumer sciences programs. Emphasis on educational leadership and related issues in a variety of educational settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 806 Evaluation and Assessment****Prerequisites:** Admission to CYAF Graduate program**Description:** Procedures for appraisal of individual growth and achievement in all subject areas in family and consumer sciences. Development of evaluative instruments for cognitive, affective, and psychomotor learning and interpretation of data in the evaluation of various types of family and consumer sciences programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 807 Supervisory Leadership****Crosslisted with:** ALEC 407, ALEC 807**Prerequisites:** ALEC 302**Description:** Knowledge and theoretical basis for practicing supervisors in a changing workplace where supervisors have increasing responsibilities due to the flattening or organizational structures, solving supervisory challenges in organizing and planning, problem solving and decision making, performance appraisal and leading a diverse workforce.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 808 Occupational Programs in Family and Consumer Sciences****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Iowa State University.**Description:** Planning and implementing occupational Family and Consumer Sciences programs in career and technical education. Cooperative education, career pathways, and work-based education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 809 Curriculum Development in Family and Consumer Sciences****Prerequisites:** Admission to CYAF Graduate program**Description:** Development of family and consumer sciences programs for secondary schools, colleges, universities, and extension programs. Focus on theories of curriculum and recent trends affecting family and consumer sciences programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 810 Transdisciplinary Obesity Prevention****Crosslisted with:** NUTR 810**Prerequisites:** NUTR 455 or equivalent; Graduate standing**Description:** Using a transdisciplinary team of faculty and guest lecturers, students will be introduced to the interrelationship of obesity and dietary components, behavior, exercise and sports science, physical activity, health promotion, genetics, nutrigenomics, child development, family dynamics, cultural issues, epidemiology, population disparity, educational leadership, public policy and other related topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NUTR 910, CYAF 910**CYAF 811 Family Immigration and Migration****Description:** Exploration of migration in a global context, including how policies shape emigration and immigration of families in different parts of the world. Specific attention will be paid to the social, cultural, political, and economic factors related to early childhood education, parenting, adolescent identity, marriage and relationships, elder care, health and wellbeing, and host-country integration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**CYAF 812 Supervision of Secondary Student Teachers****Prerequisites:** Admission to CYAF Graduate program**Description:** The course is designed to prepare cooperating teachers within Career & Technical Education, specifically, family and consumer sciences. Supervision of student teachers is an essential component of teacher preparation, and as such, the roles of student teacher, cooperating teacher, university supervisor, and state department of education will be analyzed. Mentoring strategies, evaluation and feedback models and collaborative teaching approaches will also be discussed. An opportunity will be provided to address potential areas of concern regarding teacher preparation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 813B Internship: Selected Experiences****Prerequisites:** Permission**Notes:** Pass/No Pass only.**Description:** Actual and simulated experiences in working with persons through human resources and family sciences in special focused areas of student's choice, e.g., adult education, career education, post-secondary education, special needs programs, consumer affairs.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND

CYAF 814 Evaluation in Career and Technical Education**Crosslisted with:** TEAC 814**Description:** Two aspects of evaluation in the classroom: 1) selection and use of evaluation in assessing learning, and 2) consideration of conceptual and methodological issues in conducting evaluation to determine and account for the effectiveness of programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 815 Family and Violence in the Global Context****Description:** The concept of violence includes both interpersonal violence (child abuse, violence against women) and collective violence (war, genocide) and their intersections. The nature, causes, agents, and consequences of, as well as responses to violence are examined in the social, political, economic, cultural and global contexts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**CYAF 816 Educational Programming****Crosslisted with:** CYAF 416**Prerequisites:** Permission**Description:** Planning and implementing developmentally appropriate educational experiences for a variety of audiences in non-formal settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 817 Critical Issues for the Beginning Family and Consumer Sciences Teacher****Description:** Examines issues faced by beginning or returning Family and Consumer Sciences (FCS) teachers. Possible issues are classroom management, planning, selecting resources, and other critical issues to the new teacher. The theory and its application to the students; educational setting discussed for each issue. Includes how teachers can mentor and support one another as a collaborative group.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 818 History and Philosophy of Family and Consumer Science and Career and Technical Education****Prerequisites:** Admission to CYAF degree program and permission**Notes:** Distance education course delivered by University of Nebraska-Lincoln.**Description:** History, mission, philosophy and development of Family and Consumer Sciences (CYAF) and career and technical education. Societal context for families and communities. Impact of selected legislation on family and consumer sciences programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 821 Insurance Planning for Families****Prerequisites:** Admission to CYAF graduate program**Description:** Risk management concepts, ethical considerations, tools, and strategies for individuals and families. Life insurance; property and casualty insurance; liability insurance; accident, disability, health, and long-term care insurance; and, government-subsidized programs. Case studies provide experience in selecting appropriate insurance products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 822 Financial Counseling****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by North Dakota State University.**Description:** Theory and research regarding the interactive process between clients and practitioner, including communication techniques, motivation and esteem building, the counseling environment, ethics, and methods of data intake verification and analysis. Legal issues, compensation, uses of technology to identify resources, information management, and current or emerging issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 823 Estate Planning for Families****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Montana State University.**Description:** Fundamentals of the estate planning process, including estate settlement, estate and gift taxes, property ownership and transfer, and powers of appointment. Tools and techniques used in implementing an effective estate plan, ethical considerations, and new and emerging issues in the field. Case studies provide experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 824 Fundamentals of Financial Planning****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Kansas State University.**Description:** Issues and concepts related to the overall financial planning process and establishing client-planner relationships. Services provided, documentation required, and client-CFP licensee relationships. Competencies related to gathering of client data, determining goals and expectations, and assessing the client's financial status. Emerging issues and the role of ethics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CYAF 825 Reading in the Content Area**Prerequisites:** Admission to CYAF graduate program**Description:** Basic reading and writing process relating to content literacy including schema theory, comprehension, and second language acquisition. The contribution of content literacy to content material and positive learning environments. Use of a variety of materials including textbooks, literature, Internet resources and media in the content classroom. Assisting diverse students in the use of reading, writing and vocabulary strategies to learn content material.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 826 Military Personal Financial Readiness****Description:** An overview of the topics relevant to the financial planning process including: Unique needs, terminology, benefits, and resources that impact military service members and their families. Status of service member; financial readiness; financial management; recordkeeping; cash flow management; tax management; retirement management; estate management; and special topics management; risk management; credit and debt management; savings, education planning, and investment. Distance education course delivered by Kansas State University.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 827 Lifespan Development****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 827 is open to students in the Military Academic Advancement Program.**Description:** This course covers the human development including the cognitive, social-emotional, motor, language, and moral domains from both a lifespan and a bio-ecological perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 828 Retirement Planning, Employee Benefits and the Family****Prerequisites:** Admission to CYAF graduate program**Description:** Micro and macro considerations in retirement planning for individuals and families. Various types of retirement plans, ethical consideration in providing retirement planning services, assessing and forecasting financial needs, integration of retirement plans with government benefits, and current research and theory. Case studies provide experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 829 Leadership, Administration, & Management in Community Programs****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 829 is open to students in the Military Academic Advancement Program.**Description:** This course serves as an overview of management and leadership concepts related to the operational and administrative competencies necessary in effective community-based family and youth organizations and agencies. It is designed to provide students with foundational skills and knowledge to manage day-to-day functions related to organizational systems such as human resource management, financial management, risk management, strategic planning, governance and advisory structures, and marketing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 831 Immigrant Families and Life Stories****Description:** History, culture, and experiences of immigrant and transnational families. Examination of the current state of global immigrant families, future trends, and implications for family services and policy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 832 Techniques of Supervision in Family and Consumer Sciences Education****Prerequisites:** Admission to CYAF Graduate program**Description:** The philosophy, responsibilities, and techniques of supervision in family and consumer sciences and other learning environments. Designed for masters and doctoral level students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 833 Children, Families, Communities and the Natural Environment****Description:** Examine interconnections among children, families, communities and the natural environment, with implications for sustainability and programming.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 834 Marriage and Committed Relationships from a Worldwide Perspective****Description:** Examination of the complexities of marital and committed relationships from both global and developmental perspectives and through Ecological Systems and Family Systems theoretical lenses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CYAF 835 Professional Practices in Financial Planning**Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Kansas State University.**Description:** Challenges of managing financial planning practices: business valuation, personnel, marketing, client services, ethics and technical applications. Case study analysis, relying on a theoretical and applied approach, will provide practical exposure to management issues. Emphasis on current research findings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 836 Financial Planning Case Studies****Prerequisites:** Completion of all courses toward the Family Financial Planning specialization or permission**Notes:** Distance education course delivered by Kansas State University.**Description:** Capstone course integrating both theoretical and applied concepts, including research findings introduced in all other courses. Students develop written financial plans based on comprehensive cases, presented to a panel of practitioners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 837 Families Across the Life Course****Description:** Exploration of family interactions and individual development across the life span and the cultural, political, and social factors that impact development globally.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 838 Parenting Education****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 838 is open to students in the Military Academic Advancement Program.**Description:** The course is needed for the online specialization in Family and Community Services. This course will examine theories, models, research and skills regarding parenting effectiveness and parent-child relations in the context of Western and Eastern cultures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 839 Program Development and Evaluation****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 839 is open to students in the Military Academic Advancement Program.**Description:** This course analyzes the principles and methods of program design, implementation, and outcome evaluation of family programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 840 Personal Income Taxation****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Montana State University.**Description:** Income tax practices and procedures including tax regulations, tax return preparation, tax audits, appeals, preparation for an administrative or judicial forum, and ethical considerations. Family/individual case studies provide practice in applying and analyzing information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 841 Housing/Real Estate****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Iowa State University.**Description:** The role of housing and real estate in the financial planning process from a theoretical perspective. Taxation, legal aspects, mortgages, and financial calculations related to home ownership and real estate investments. New and emerging issues, as well as the role of ethics in financial planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 842 Parent-Child Relationships Across the Life Span****Description:** Study of parent-child relationships from a developmental, systems, and life-span perspective, including theory, research methods, and application of knowledge.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 843 Family, School and Community Partnerships****Description:** The role of family, school, and community partnerships in learning and development across the world. Strategies for mobilizing these partnerships to affect change in diverse environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 844 Family Centered Practice through the Life Course****Description:** The connection and collaboration between services and families will be explored with an emphasis on building family-friendly, family-supportive community structures that harness family strengths.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 845 Research in Leadership Education****Crosslisted with:** ALEC 845**Description:** Steps in preparing a research proposal, including statement of the research question, review of relevant literature, and determination of an appropriate research design and methodology. Research methodology, including both quantitative and qualitative procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CYAF 846 Addictions and Families

Crosslisted with: CYAF 446, CYAF 446H

Description: Introduction to addictions from a family systems perspective: theories; behavioral patterns; physiological, psychological and social impacts on individuals and the family; and implications for interventions and treatment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 847 Working with Gay, Lesbian, Bisexual and Transgender (GLBT) Youth in Professional Context

Crosslisted with: WMNS 847, CYAF 447, WMNS 447

Description: Contextual considerations and research-informed guidelines for working with Gay, Lesbian, Bisexual, and Transgender (GLBT) youth in professional settings such as education, mental health, medical, and community outreach. The systemic context of GLBT youth, including developmental transitions, unique stressors, peer relationships, familial environments, and ways to help GLBT youth thrive

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 848A Financial Theory and Research I

Description: Theories of family functioning, macroeconomic theory related to family resource allocation decisions, the family as an economic unit, and the interaction of the economy and families.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CYAF 848B

CYAF 848B Financial Theory and Research II

Prerequisites: CYAF 848A

Description: Microeconomic theory as it relates to family resource allocation decisions, theories of household behavior, the life cycle hypothesis, behavioral economics, behavioral finance, theories of behavioral change, and psychological theories of family well-being. Focus on empirical research investigating household financial decision-making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 849 Resilience in Families

Prerequisites: Admission to CYAF graduate program

Notes: CYAF 849 is open to students in the Military Academic Advancement Program.

Description: Exploration of the evolution of a resilience approach to the study of families and human development. Using a lifespan approach, students will explore resilience across time as well as within special populations such as families experiencing crisis and trauma, culturally diverse families, and military families.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 850 Teaching Family and Consumer Sciences with Technology

Prerequisites: Admission to the CYAF graduate program

Notes: Distance education course delivered by South Dakota State University.

Description: Integration of technology in the family and consumer sciences classroom focusing on the National Education Technology Standards (NETS).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 851 Learning and Teaching Principles and Practice in Family and Consumer Sciences

Crosslisted with: CYAF 451

Prerequisites: Admission to the Family and Consumer Sciences Secondary Teacher Education Program; completion of 80% of subject area coursework with a 2.5 GPA or better; parallel CYAF 297J (1 cr) or CYAF 894J (1 cr)

Description: Theoretical issues in the area of teaching and learning as applied in Family and Consumer Sciences. Development of middle and secondary education curriculum in Family and Consumer Sciences using student-centered, interactive methods of instruction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 852 Curriculum Principles and Practices in Family and Consumer Sciences

Crosslisted with: CYAF 452

Prerequisites: Admission to the Family and Consumer Sciences Secondary Teacher Education Program; completion of 80% of subject area course work with a 2.5 GPA or better; CYAF 451/851; parallel CYAF 397J (1 cr) or CYAF 894J (1 cr)

Description: Practical issues in the area of teaching and learning as applied to Family and Consumer Sciences. Develop teaching and/or learning plans for teaching Family and Consumer Sciences. Analyze classroom management practices and develop plans for assessment.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

CYAF 853 Families in Crisis**Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 853 is open to students in the Military Academic Advancement Program.**Description:** The purpose of this course is to examine the experiences of individuals and families when crises occur. The course is designed to introduce you to traumatic stress from both individual and systemic theoretical perspectives. It will introduce and review the theoretical and historical beginnings of the concept of trauma, which includes the acceptance of post-traumatic stress disorder (PTSD) as a diagnosis in the DSM IV. This course will discuss various trauma reactions, effects of stressful events, as well as the treatment of trauma, stress and crises. Resilience and transcendence of trauma will be outlined, with an emphasis on the importance of self-care for helping professionals working in this area. A particular focus will be placed in understanding the common and unique experiences of individuals and families affected by grief and loss, addictions and substance abuse, violence, child abuse and neglect, and suicidal ideation based on various contextual factors. The course will include discussion of evidence-based prevention and treatment options as well as community resources for individuals and families affected by stress, trauma, and crises.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 854 Family Dynamics****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 854 is open to students in the Military Academic Advancement Program.**Description:** The course will examine theories of family function and dysfunction, techniques of assessment, and models of family intervention.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 855 Psychology of Adolescence****Prerequisites:** Admission to the CYAF graduate program and permission**Notes:** Distance education course delivered by North Dakota State University.**Description:** Student differences and ways of adjusting teaching practice to meet individual needs. Application of learning theories to educate the whole child (cognitive, affective, social). Equitable treatment of students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 856 Foundations and Principles in Family and Community Services****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 856 is open to students in the Military Academic Advancement Program.**Description:** This course provides an introduction to the program of family and community services and professions that involve working with individuals and families in communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 857 Family Resource Management****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 857 is open to students in the Military Academic Advancement Program.**Description:** Survey course of personal finance and family resource management literature to provide an overview of how individual and family members develop and exercise their capacity to obtain and manage resources to meet life needs. Resources include the self, other people, time, money, energy, material assets, space, and environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 858 Family Stress and Crisis, Coping and Recovery****Crosslisted with:** CYAF 458**Prerequisites:** Junior standing.**Description:** Normative and non-normative family stressors (e.g. violence, economic conditions, war and political conflict, natural disasters) and how they affect family functioning. Family stress theories are used to understand crisis events and how families can cope and recover.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 859 Interpersonal Relationships****Prerequisites:** Admission to CYAF graduate program**Notes:** CYAF 859 is open to students in the Military Academic Advancement Program.**Description:** This course will conduct an in-depth examination of interpersonal relationships, including theoretical perspectives, research methods, relationship forms, relationship processes, and how context affects relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 860 Human Dimensions of Sustainability****Crosslisted with:** CYAF 460**Description:** Examination of the interdependence of human, ecological, economic sustainability and ways to lead a more sustainable life.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 861 Foundations of Youth Development****Prerequisites:** Admission to CYAF graduate program**Description:** Fundamentals of youth development and the youth development profession. Ethical, professional and historical elements of youth development as it has evolved toward professionalization.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

CYAF 862 Case Studies: Strengths and Challenges of Families Across the World

Description: Exploration of family strengths and challenges from multiple nations and cultures using case study methodology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 863 Youth Professionals as Consumers of Research

Prerequisites: Admission to CYAF graduate program

Notes: Distance education course delivered by the University of Nebraska-Lincoln and North Dakota State University.

Description: Research report evaluation skills for youth development professionals. Fundamental quantitative and qualitative research principles guiding disciplined inquiry. Application of research results and theories to practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 864 Community Youth Development

Prerequisites: Admission to CYAF graduate program

Notes: May be offered via distance education by Michigan State University.

Description: National emphasis of strength-based or asset approach to community youth development, encompassing individual development and adolescent relationships with environments. Research, theory and practice applied in communities. Existing models, theoretical and applied literature, and current community efforts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 865 Research Design and Methods

Description: Qualitative and quantitative research designs and methods used in conducting research. Students develop a research proposal.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CYAF 982; CYAF 983

CYAF 866 Family Professionals as Consumers of Research

Description: Elements of conducting and reporting research and various research designs. Quantitative and qualitative methodologies. Skills required to effectively evaluate the quality of research reports and how to apply findings to practices in education, counseling, and family policy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 868 Adolescents and Their Families

Prerequisites: Admission to CYAF graduate program

Notes: Distance education course delivered by Kansas State University and the University of Missouri-Columbia.

Description: Adolescent development as related to and intertwined with family development. Reciprocal influences between adolescents and their families. Working with youth vis a vis the family system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 869 Administration and Program Management

Prerequisites: Admission to CYAF graduate program

Notes: Distance education course delivered by Kansas State University and the University of Missouri-Columbia.

Description: Introduction to the development, administration and management of youth-serving organizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 871 Human Sexuality and Society

Crosslisted with: CYAF 471, EDPS 471, PSYC 471, SOCI 471, EDPS 871, PSYC 871, SOCI 871

Prerequisites: Junior standing.

Notes: Open to advanced students planning careers in the professions in which knowledge of human behavior and society is important (e.g., helping professions, medicine, law, ministry, education, etc.).

Description: Interdisciplinary approach to the study of human sexuality in terms of the psychological, social, cultural, anthropological, legal, historical, and physical characteristics of individual sexuality and sex in society.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 872 Youth Development

Prerequisites: 12 hours CYAF or social sciences

Notes: Distance education course delivered by the University of Nebraska-Lincoln and the University of North Dakota.

Description: Scientific literature concerning the interrelationship of the physiological, psychological and sociological aspects of the adolescent and young adulthood years. Understanding of individuals and their continuous adjustment within the family life cycle as they make the transition from childhood to adulthood.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 873 Program Design, Evaluation and Implementation**Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by the University of Nebraska-Lincoln.**Description:** Overview of program development process and outcome evaluation of community children and family programs. Theoretical, methodological and programmatic issues in conducting programs and scholarship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 874 Assessment in Early Childhood****Crosslisted with:** CYAF 474**Prerequisites:** 12 hours CYAF, PSYC, EDPS, TEAC, or SECD**Description:** Selection, use, and interpretation of assessment instruments for understanding the developmental level of children from birth through age eight. Assessment of reasoning and thinking processes, concept formation, and social cognition.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 362**CYAF 875 Youth in Cultural Contexts****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Michigan State University and the University of Missouri-Columbia.**Description:** Cultural context factors that affect youth from a holistic perspective within and outside the family unit. The cultural heritage of differing family types. Social and educational processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 876 Cognitive Processes in Children****Crosslisted with:** CYAF 476**Description:** Overview of early childhood cognitive development and education. Nature and development of reasoning and thinking processes and concept formation in children. In-depth examination of early childhood cognitive developmental theories and their implications for teachers, parents, and others working with young children.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 877 Administration of Early Childhood Programs****Crosslisted with:** CYAF 477**Prerequisites:** 12 hrs family and consumer sciences including CYAF 270.**Description:** Administration of early childhood programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 878 Youth Policy****Prerequisites:** Admission to CYAF graduate program**Notes:** Distance education course delivered by Michigan State University.**Description:** Various federal and state policies designed specifically for youth. Existing state and national policies as to whether they contribute to, or act as barriers to, desired developmental outcomes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 879 Research Methods in Family Studies****Description:** Scientific, holistic and innovative approaches to studying children and families across the globe. The influence of international, cross-cultural, and other multi-national social, religious, and political contexts that affect the study of families throughout the world will be explored.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 880 Contemporary Youth Issues****Description:** Issues faced by youth such as life skills, violence, and appearance. Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**CYAF 882 Understanding Families from a Global Context****Crosslisted with:** CYAF 482**Prerequisites:** 12 hours of coursework in CYAF, PSYC, SOCI, TEAC, or CRIM.**Description:** Acquire the knowledge, competencies, and experiences that will allow greater participation as a global citizen by examining the historical, cultural, ethnic, economic, systemic and socio-cultural complexities of families.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 882A Learning Abroad with Child, Youth and Family Studies****Crosslisted with:** CYAF 482A**Description:** Experience the rich culture within countries around the world through interactions with families, children, couples and individuals within their country context. Emphasis is on learning about families, early childhood, youth and adults, and the impact of systems and services within the cultural context.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD

CYAF 883 Investing for the Family's Future

Prerequisites: Admission to CYAF graduate program

Notes: Distance education course delivered by Iowa State University.

Description: Investment options for families. Common stocks, fixed income securities, convertible securities, and related choices. The relationship between investment options and employee and/or employer benefit plan choices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 884 Foundations in Family Studies

Description: Introduction to the trans-disciplinary field of Family Studies from global perspectives. Theoretical and research approaches to the study of the family in varied cultural and national contexts will be explored.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 885 Families and Cultural Diversity

Description: Critical understanding of the diversity of family forms in their cultural contexts. The impact of history, tradition and contemporary trends on families will be explored. Emphasis will be on recognizing, accepting, and working within a context of diversity of culture and family form.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 886 Strengthening Families for Meeting Challenges of the 21st Century

Description: Theoretical, practical and experiential learning to enhance understanding of family strengths and challenges across the world. Principles for developing culturally sensitive strengths-enhancing programming for children and families throughout the world will be addressed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 887 International Perspective on Family Policy

Description: Analysis of the systems, contexts and policies that affect individuals and families throughout the world.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 888 Child and Family Policy

Crosslisted with: CYAF 488

Prerequisites: Junior standing.

Description: Analysis of child and family policies, including what is family policy, how policy is made and implemented, how values and goals affect policy and future directions for child and family policies in America and in other countries.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 889 Program Design , Implementation and Evaluation

Description: Analysis of the systems, contexts and policies that affect individuals and families throughout the world.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 890 Workshop Seminar

Crosslisted with: CYAF 490

Description: Special topics related to child, youth, and family studies. Topics vary.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

CYAF 890A Workshop Seminar: Early Childhood

Crosslisted with: CYAF 490A

Description: Special topics related to child, youth, and family studies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 890D Workshop Seminar: Family Science

Crosslisted with: CYAF 490D

Description: Special topics related to child, youth, and family studies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LAB

CYAF 890J Workshop Seminar: Family and Consumer Science Education

Crosslisted with: CYAF 490J

Description: Special topics related to child, youth, and family studies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 890Y Workshop Seminar: Youth Development

Crosslisted with: CYAF 490Y

Description: Special topics related to child, youth, and family studies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 891 Special Topics in Human Sciences

Crosslisted with: HUMS 891, NUTR 891, SLPA 891, TEAC 891, TMFD 891

Description: Aspects of human sciences not covered elsewhere in the curriculum.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 892 Special Topics in Education**Crosslisted with:** EDAD 892, EDPS 892, EDUC 892, SPED 892, TEAC 892**Prerequisites:** EDPS 859 or parallel; EDPS 859 or equivalent**Description:** Aspects of education not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 893 Special Topics in Contemporary Family Issues****Crosslisted with:** CYAF 493**Description:** Current issues that today's families experience. Topics vary and include, for example: Gender and family, low-income families, fathers and fatherhood, families with children who have disabilities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 894J Professional Practicum Experiences****Prerequisites:** Admission to CYAF degree program**Description:** Family and Consumer Sciences Education.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**Prerequisite for:** CYAF 452, CYAF 852**CYAF 895 Special Topics in Family and Cultural Diversity****Crosslisted with:** CYAF 495**Notes:** Topics vary.**Description:** Contemporary ethnic diversity or global family issues.

Topics vary and include, for example: Immigrant and refugee families, ethnic diversity and discrimination, global family well-being, and cultural strengths.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 18**Format:** LEC**CYAF 895A Study Abroad/Away in Child, Youth & Family Studies****Crosslisted with:** CYAF 495A**Prerequisites:** Department permission**Description:** Participation in a department sponsored Study Abroad experience. Must enroll in course during time of experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**CYAF 896 Advanced Independent Study****Crosslisted with:** CYAF 496**Prerequisites:** 12 hrs CYAF and/or related social sciences.**Notes:** Requires a contract and the contract is to be completed before registering for the course. Work is supervised and evaluated by a CYAF faculty member.**Description:** Individual projects in research, literature review, or creative production may or may not be an extension of course work.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**CYAF 897A Student Teaching in Early Childhood Education****Prerequisites:** CYAF 270 and CYAF 270L with grades of 'C' or better; and permission.**Description:** Integrating development theory into the planning, implementation, and evaluation of individual and group experiences for young children in the child development laboratory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 897B Practicum in Family Financial Planning****Prerequisites:** Admission to CYAF graduate program**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**CYAF 897D Community Internship in Child, Youth and Family Studies****Crosslisted with:** CYAF 497D**Prerequisites:** Permission**Notes:** Orientation in prior semester and contract required.**Description:** Fieldwork in agencies serving children, youth, families and communities.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**CYAF 897E Practicum in Family and Consumer Sciences Education****Prerequisites:** Admission to CYAF degree program and permission**Description:** Development and implementation of teaching plans in supervised schools grades 7-12. Observation of the effectiveness of classroom management practices.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD

CYAF 897I Student Teaching in an Infant/Toddler Program**Crosslisted with:** CYAF 497I**Description:** Integrated developmental theories and research evidence into the planning, implementation, and evaluation of individual and group experiences for children in an infant and toddler program.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**CYAF 897J Student Teaching in Family and Consumer Sciences****Crosslisted with:** CYAF 497J**Prerequisites:** Admission by application; completion of all required methods courses and practica with minimum grade of 'C+' (2.33) in each of these courses.**Notes:** Requires a middle-level or high school experience. Pass/No Pass only.**Description:** Supervised teaching experience in schools.**Credit Hours:** 6-9**Min credits per semester:** 6**Max credits per semester:** 9**Max credits per degree:** 9**Format:** FLD**CYAF 897K Student Teaching in Kindergarten****Description:** Integrating developmental theories and research evidence into the planning, implementation, and evaluation of individual and group experiences for children in a classroom experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**CYAF 898 Research Experience in Child, Youth and Family Studies****Prerequisites:** 18 hrs CYAF and/or social sciences**Description:** Participation in an ongoing research project in child development studies and/or early childhood education, family science, marriage and family therapy, family and financial management, or family and consumer sciences education.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**CYAF 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**CYAF 900 Philosophy of Child and Family Sciences****Description:** Theory and modes of inquiry in child and family science, and how this theory and evidence is used to discover knowledge.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 901 CYAF Professional Development Seminar****Prerequisites:** admission to the doctoral program in CYAF**Description:** Facilitate professional development and career readiness of doctoral students**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CYAF 910 Research Planning and Grant Writing for Childhood Obesity****Crosslisted with:** NUTR 910**Prerequisites:** NUTR 810 or CYAF 810**Description:** The purpose of this course is to examine the philosophy, goals, and methodologies related within the concept of childhood obesity research and to apply the principles of the transdisciplinary nature of childhood obesity prevention and treatment in transdisciplinary obesity prevention research and evaluation. The course will include acquisition of resources to address childhood obesity issues, exposure to funding opportunities, research design and grant development, translation of research or programmatic findings to community and professional audiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NUTR 911, CYAF 911**CYAF 911 Practicum: Experiential Learning Experiences in Childhood Obesity Prevention****Crosslisted with:** NUTR 911**Prerequisites:** NUTR 910 or CYAF 910 or concurrent**Notes:** Practicum: Experiential Learning Experiences in Childhood Obesity Prevention is a section of the Nutrition and Health Sciences Practicum course.**Description:** An applied, monitored, and supervised field based learning experience. Gain practical experience as they follow a negotiated and/or directed plan of study. The purpose of this course is to provide students with transdisciplinary experiential learning experiences related to childhood obesity prevention or treatment. Students will work with the course instructor to determine a practicum site that meets the student's interests and the requirements of the course. Students will work collaboratively with a transdisciplinary team of individuals at the practicum site to meet the course student learning outcomes through hands on experiences.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** FLD**CYAF 920 Teaching Practicum****Crosslisted with:** NUTR 920, TMFD 920**Prerequisites:** CYAF 918**Description:** Supervised classroom experiences designed to develop competencies in teaching at the college level.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD

CYAF 930 Sociological/Anthropological Research Methods in Education**Crosslisted with:** EDPS 930, NUTR 930, TEAC 930**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**CYAF 930A Ethnographic Methods****Crosslisted with:** EDPS 930A, NUTR 930A, TEAC 930A, ANTH 930A**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 930B Special Topics in Qualitative and/or Quantitative Research Methods****Crosslisted with:** EDPS 930B, NUTR 930B, TEAC 930B**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**CYAF 930D Discourse Analysis Across School, Home and Community Settings****Crosslisted with:** EDPS 930D, NUTR 930D, TEAC 930D**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 930E Introduction to Linguistic Analysis of Classroom Interaction****Crosslisted with:** EDPS 930E, NUTR 930E, TEAC 930E**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 930J Hermeneutic Traditions in Education****Crosslisted with:** EDPS 930J, NUTR 930J, TEAC 930J**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 930K Quantitative Research Traditions in Education****Crosslisted with:** EDPS 930K, NUTR 930K, TEAC 930K**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 930M Introduction to Multimodal Textual Analysis****Crosslisted with:** EDPS 930M, NUTR 930M, TEAC 930M**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CYAF 951 Theoretical Foundations of Marriage and Family Therapy****Prerequisites:** 12 hrs CYAF and/or social sciences**Description:** General systems theory, its derivations and application in family therapy. Family therapy's history, contributions, current theorists, and approaches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CYAF 954; CYAF 955**CYAF 952 Psychopathology and Dysfunctional Interactions****Description:** Psychological, behavioral and emotional disorders identified in the Diagnostic and Statistical Manual and various interpersonal dysfunctions. Interpersonal antecedents and consequences of these disorders. Integration of individual and family diagnosis. Research supporting treatment from a family systems approach.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CYAF 954**CYAF 953 Issues and Ethics for Family Professionals****Prerequisites:** 12 hrs CYAF and/or social sciences**Description:** Ethical and professional issues that family professionals confront as they assist families to cope with problems and strengthen family systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CYAF 954 Assessment in Family Therapy

Prerequisites: 12 hrs CYAF and/or social sciences; CYAF 951 and 952, or equivalent

Description: Assessment of family systems using objective and subjective measures for the purpose of clinical intervention and research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 955 Clinical Family Therapy

Prerequisites: 12 hrs CYAF and/or social sciences; masters admission in CYAF; CYAF 951, and permission

Description: Didactic training and supervised laboratory/clinic-based experiences in marriage and family therapy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LAB

Prerequisite for: CYAF 997

CYAF 956 Couples and Sex Therapy

Prerequisites: Permission

Notes: CYAF 956 is only open to those students involved in clinical training.

Description: This course examines sexual functioning through a systemic perspective as it relates to clinical practice with individual adults and couples. Research and theories pertaining to sexual development, sexual behavior and expression, and relational sexual functioning are explored. Assessment and treatment of sexual and associated partner relational dysfunctions are examined from theoretical and applied perspectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 961 Seminar in Parent/Child Relationships

Description: Relationships between parents and children from the developmental, contextual, and life-span perspectives. Theoretical, methodological, and applied implications of research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 970 Advanced Early Childhood Education

Prerequisites: 18 hrs PSYC, EDPS, SOCI, or CYAF

Description: Advanced philosophy, procedures, and policies relating to early childhood education at the nursery school-kindergarten level and care of children outside the home.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 971 Seminar in Child Development

Prerequisites: 18 hrs PSYC, EDPS, SOCI, or CYAF

Description: Analysis of major studies and current literature in Child Development/Early Childhood Education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 972 Theories of Human Development and Family Relations

Prerequisites: 18 hrs PSYC, and/or EDPS, and/or SOCI, and/or CYAF

Description: Theoretical basis of child study and family analysis. Critical evaluation of methods and theories in child development, family relations, and human development from an integrative and holistic perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 973 Social Processes in Children

Prerequisites: Graduate Standing

Description: Synthesis of current and historical perspectives in theory and research on children's social development including multiple contexts for socialization/individuation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 974 The Infant in the Family

Prerequisites: 12 hrs in CYAF, or social sciences

Description: Infant development within the context of the family.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 982 International Research Methods for Advanced Global Scholars

Prerequisites: CYAF 865 or equivalent

Description: Introduction to the intricacies of conducting research in countries other than the US. The course is divided into two sections. Section I prepares for successful global research by focusing on cultural competence and sensitivity, developing international relationships and collaborations, and global professional ethics. Section II will focus on applications of these concepts by introducing a variety of successful approaches and research methodologies through the international research of CEHS faculty. The emphasis will be on qualitative and quantitative research methods used across the multiple disciplines represented in the college.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 983 Research Methods for Relational Dynamics

Prerequisites: CYAF 865 or equivalent

Description: Examination of research methods used in family science, focusing on helping students to develop the knowledge and skill needed to evaluate and conduct research in which the family is the primary unit of analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 989 Collaborative Health Care

Description: Conceptual models for collaborative care practices with an emphasis on care delivery systems in rural areas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CYAF 995 Doctoral Seminar**Prerequisites:** Permission**Notes:** CYAF 995 is intended primarily for doctoral students, although other graduate students may be admitted with permission.**Description:** Develop, execute and report on one or more projects on an individual or small group basis. Immersion in outcome-based scholarly activities with a faculty mentor. The interaction between research and practice.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 18**Format:** LEC**CYAF 996 Scholarly Practice and Discovery****Prerequisites:** Permission**Description:** Investigation related to family and consumer sciences.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**CYAF 997 Advanced Practicum in Family Therapy****Prerequisites:** CYAF 955 and permission**Description:** Supervised marital and family therapy in university and community agencies.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**CYAF 998 Special Topics in Human Sciences****Crosslisted with:** NUTR 998, TMFD 998**Prerequisites:** Permission**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** IND**CYAF 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Civil Engineering (CIVE)

CIVE 801 Civil Engineering Systems**Crosslisted with:** CIVE 401**Prerequisites:** MATH 221.**Description:** Systems analysis approach to civil engineering problems. Systems model elements and principles of systems theory with applications to civil engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 819 Flow Systems Design****Crosslisted with:** CIVE 419**Prerequisites:** CIVE 326 or CIVE 327; parallel CIVE 352.**Description:** Application of hydraulic principles to the design of water distribution systems, wastewater and stormwater collection systems, channelized flow systems, and treatment facilities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 821 Hazardous Waste Management and Treatment****Crosslisted with:** CIVE 421**Prerequisites:** CIVE 326/BSEN 326.**Description:** Survey of the hazardous waste management system in the USA. State and federal hazardous waste regulations. Chemical characteristics of hazardous waste and unit operations and processes used for treatment of soil, water, and air.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 822 Pollution Prevention: Principles and Practices****Crosslisted with:** BSEN 422, BSEN 822, CIVE 422**Prerequisites:** Permission.**Description:** Introduction to pollution prevention (P2) and waste minimization methods. Practical applications to small businesses and industries. Legislative and historical development of P2 systems analysis, waste estimation, P2 methods, P2 economics, and sources of P2 information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 823 Physical and Chemical Treatment Processes in Environmental Engineering****Prerequisites:** CIVE 326, CIVE 425**Description:** Evaluation and analysis of physical and chemical unit operations and processes applied to the treatment of water, wastewater, and hazardous wastes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 824 Solid Waste Management Engineering****Crosslisted with:** CIVE 424**Prerequisites:** CIVE 326, CIVE 334.**Description:** Planning, design and operation of solid and waste collection processing, treatment, and disposal systems including materials, resources and energy recovery systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CIVE 826 Design of Water Treatment Facilities**Crosslisted with:** CIVE 426**Prerequisites:** CIVE 425.**Description:** Analysis of water supplies and design of treatment and distribution systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 827 Design of Wastewater Treatment and Disposal Facilities****Crosslisted with:** CIVE 427**Prerequisites:** CIVE 425.**Description:** Analysis of systems for wastewater treatment and disposal.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 828 Environmental Engineering Chemistry****Prerequisites:** CIVE 326**Description:** Basic concepts from general chemistry. Thermodynamic and kinetic basis for the composition of aquatic systems. Equilibrium chemistry, including acid-base reactions, reduction-oxidation reactions, metal speciation and precipitation, and gas/liquid partitioning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**CIVE 829 Biological Waste Treatment****Prerequisites:** CIVE 326**Description:** Principles of biological processes and their application in the design of waste treatment systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 830 Fundamentals of Water Quality Modeling****Crosslisted with:** CIVE 430**Prerequisites:** CIVE 326.**Description:** Comprehensive study of water quality and the effects of various water pollutants on the aquatic environment; modeling of water quality variables.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 831 Small Treatment Systems****Crosslisted with:** CIVE 431**Prerequisites:** CIVE/BSEN 326 or CIVE/BSEN 326H**Description:** Design of small and decentralized waste water management systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 832 Bioremediation of Hazardous Wastes****Crosslisted with:** CIVE 432**Prerequisites:** CIVE/BSEN 326 and CIVE/MECH 310.**Description:** Principles, applications, and limitations of bioremediation of hazardous wastes and design of some bioremediation systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 834 Soil Mechanics II****Crosslisted with:** CIVE 434**Prerequisites:** CIVE 334.**Description:** Application of the effective stress principle to shear strength of cohesive soil; analysis of stability of slopes. Development of continuum relationships for soil; solutions for stresses and displacements for an elastic continuum. Solution of the consolidation equation for various initial and boundary conditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 836 Foundation Engineering****Crosslisted with:** CIVE 436**Prerequisites:** CIVE 334.**Notes:** Optional lab CIVE 436L/CIVE 836L.**Description:** Subsoil exploration and interpretation; selection of foundation systems; determination of allowable bearing capacity and settlement; design of deep foundations; pile driving analysis; control of groundwater.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 949**CIVE 839 Introduction to Bridge Engineering****Prerequisites:** CIVE 440/840, CIVE 441, CIVE 443/843; CIVE 850 or parallel**Notes:** CIVE 850 co-requisite.**Description:** Types of Bridges, Site Design Overview, Highway Bridge Loading, Bridge Analysis, Bridge Deck Slabs, Prestressed Concrete Bridge Design, Steel Bridge Design, Substructure Design, Fatigue and Bridge Rating.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**CIVE 840 Reinforced Concrete Design I****Crosslisted with:** CIVE 440**Prerequisites:** CIVE 341.**Description:** Introduction to the design concepts of reinforced concrete building components. The design of flexural and compression members, simple walls, foundations, and floor systems using the latest American Concrete Institute (ACI) design requirements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 447, CIVE 847

CIVE 842 Structural Dynamics**Prerequisites:** CIVE 341**Description:** Dynamic behavior of civil engineering structures. Free and forced vibrations of multi degree-of-freedom systems. Response of continuous beam and frames. Elasto-plastic behavior. Dynamic loads on bridges. Analysis and design considerations for buildings and bridges subjected to seismic loadings. Application of computer-aided numerical procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 945; CIVE 948**CIVE 843 Advanced Structural Analysis****Crosslisted with:** CIVE 443**Prerequisites:** CIVE 341.**Description:** Matrix analysis methods and computer solutions for indeterminate structures. Additional topics: static condensation, shear deformations, and non-prismatic members in matrix-based analyses, moment distribution method, load cases and load combinations for buildings and bridges, and influence lines and analysis for moving loads.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 839; CIVE 849**CIVE 844 Structural Design and Planning****Crosslisted with:** CIVE 444**Prerequisites:** CIVE 440 and CIVE 441.**Notes:** CIVE 844 is not available for graduate credit for civil engineering students.**Description:** Principles of design of steel and reinforced concrete structural building systems, planning of building vertical and horizontal load resisting systems, and bridge systems. Several design projects involve indeterminate analysis and design concepts for both steel and reinforced concrete.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 846 Steel Design II****Crosslisted with:** CIVE 446**Prerequisites:** CIVE 441**Notes:** A continuation of the topics covered in CIVE 441.**Description:** The principles and procedures used in design of steel buildings, design of plate girders, design and analysis of building systems, design and analysis of composite steel-concrete building systems, innovative building systems, introduction to seismic design of steel buildings. Plate buckling, beam, column and beam-column design, and frame stability. Introduction to connection design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 940; CIVE 949**CIVE 847 Reinforced Concrete Design II****Crosslisted with:** CIVE 447**Prerequisites:** CIVE 440/840**Notes:** A continuation of topics covered in CIVE 440/840.**Description:** Shear friction theory, strut-and-tie modeling, anchorage, deflection, slender and bi-axially loaded members, torsion, two-way action and punching shear, and footing design. Excel spreadsheets are developed and used for various design tasks.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 849 Introductory Finite Element Analysis in Solid Mechanics****Prerequisites:** CIVE 443/843**Description:** Matrix methods of analysis. The finite element stiffness method with a focus on solid mechanics. Isoparametric elements formulation based on energy principles. Perform finite element analyses using commercial software.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**CIVE 850 Prestressed Concrete****Prerequisites:** CIVE 341 and CIVE 440**Description:** Analysis and design of prestressed concrete members. Axial force, bending, shear, torsion, prestress losses, initial and long-term deflection, partial prestressing, statically indeterminate structures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 839**CIVE 852 Water Resources Development****Crosslisted with:** CIVE 452**Prerequisites:** CIVE 352.**Description:** Theory and application of systems engineering with emphasis on optimization and simulation techniques for evaluating alternatives in water resources developments related to water supply, flood control, hydroelectric power, drainage, water quality, water distribution, irrigation, and water measurement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 853 GIS in Water Resources****Prerequisites:** Graduate standing in Engineering or a related discipline in Natural Resources or Earth Science**Description:** Familiarization with a wide range of spatial information and used in hydrologic and water resources analysis. Development of expertise in GIS systems, especially ArcGIS. Digital mapping and analysis of water resources information. Hydrologic terrain analysis using digital elevation models. Integration of time series and geospatial data. Hydrologic Information Systems. River and watershed networks. Evapotranspiration, Precipitation (PRISM), Soil, and Landuse maps, and databases. Use of Remote Sensing tools.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CIVE 854 Hydraulic Engineering**Crosslisted with:** CIVE 454**Prerequisites:** CIVE 352.**Description:** Fundamentals of hydraulics with applications of mechanics of solids, mechanics of fluids, and engineering economics to the design of hydraulic structures. Continuity, momentum, and energy principles are applied to special problems from various branches of hydraulic engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 855 Nonpoint Source Pollution Control Engineering****Crosslisted with:** BSEN 455, BSEN 855, CIVE 455**Prerequisites:** BSEN 326/CIVE 326 or BSEN 355; AGEN/BSEN 350 or CIVE 352 as prerequisite or parallel.**Description:** Identification, characterization, and assessment of nonpoint source pollutants; transport mechanisms and remediation technologies; design methodologies and case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**CIVE 856 Surface Water Hydrology****Crosslisted with:** CIVE 456**Prerequisites:** CIVE 352**Description:** Stochastic analysis of hydrological data and processes including rainfall, runoff, infiltration, temperature, solar radiation, wind, and non-point pollution. Space-time hydrologic modeling with emphasis on the application of techniques in the design of engineering projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 857 Applied Structural Analysis****Prerequisites:** CIVE 851**Description:** Review of basic concepts. Mesh generation using a preprocessor. 2D and 3D Model generation. Boundary conditions. Implicit and explicit solution algorithms. Interpretation of analysis results using a post-processor. Solution of problems using existing FE software.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 858 Groundwater Engineering****Crosslisted with:** BSEN 458, BSEN 858, CIVE 458**Prerequisites:** CIVE 352 or AGEN 350 or BSEN 350**Description:** Application of engineering principles to the movement of groundwater. Analysis and design of wells, well fields, and artificial recharge. Analysis of pollutant movement..**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 955, AGRO 955, CIVE 955, GEOL 985**CIVE 859 Reliability of Structures****Crosslisted with:** CIVE 459**Prerequisites:** CIVE 341.**Description:** Fundamental concepts related to structural reliability, safety measures, load models, resistance models, system reliability, optimum safety levels, and optimization of design codes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 861 Urban Transportation Planning****Crosslisted with:** CIVE 461**Prerequisites:** CIVE 361.**Description:** Development of urban transportation planning objectives and goals. Data collection procedures, land use and travel forecasting techniques, trip generation, trip distribution, modal choice analyses, and traffic assignment. Site development and traffic impact analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 864**CIVE 862 Highway Design****Crosslisted with:** CIVE 462**Prerequisites:** CIVE 361**Notes:** Has an emphasis on design projects.**Description:** Design of roadways, intersections, interchanges, parking facilities, and land development site access and circulation. Emphasis on design projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 469, CIVE 869; CIVE 865**CIVE 863 Traffic Engineering****Crosslisted with:** CIVE 463**Prerequisites:** CIVE 361**Notes:** Emphasizes design projects.**Description:** Design of signalized intersections, arterial street and network signal systems, and freeway control systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 866**CIVE 864 Analysis and Estimation of Transportation Demand****Prerequisites:** CIVE 461/861**Description:** Introduction to conceptual, methodological, and mathematical foundations of analysis and design of transportation services. Review of probabilistic modeling. Application of discrete choice models to demand analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CIVE 865 Highway Geometrics**Prerequisites:** CIVE 462/862**Description:** Principles of highway geometrics. Sight distance, design vehicles, vehicle characteristics, horizontal and vertical alignment, cross section elements, and at-grade intersections and interchanges.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 866 Transportation Characteristics****Prerequisites:** CIVE 463/863 and MATH/STAT 380**Description:** Use of the concepts of volume, speed, density, and capacity to describe the characteristics and performance of surface, air, and water transportation systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CIVE 964**CIVE 867 Transportation Safety Engineering****Prerequisites:** Permission**Description:** Safety criteria in the planning, design, and operation phases of highway, rail, airport, mass transit, pipeline, and waterway transportation systems. Background of safety legislation and funding requirements. Identification of high accident locations and methods to determine cost/effectiveness of improvements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 868 Airport Planning and Design****Crosslisted with:** CIVE 468**Prerequisites:** CIVE 361.**Description:** Planning and design of general aviation and air carrier airports. Land-side components include vehicle ground-access systems, vehicle circulation parking, and terminal buildings. Air-side components include aircraft apron-gate area, taxi-way systems, runway system, and air traffic control facilities and airspace. Emphasis on design projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 869 Computer-Aided Interchange Design****Crosslisted with:** CIVE 469**Prerequisites:** CIVE 462/862**Notes:** Requires the development of an interchange design project using graphical and civil engineering software.**Description:** Principles of high-speed traffic operations, safety, and decision making related to critical design parameters used for optimal interchange geometric designs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 871 Bituminous Materials and Mixtures****Crosslisted with:** CIVE 471**Prerequisites:** CIVE 378**Description:** Understanding of the physical, chemical, geometrical, and mechanical characteristics and practical applications of bituminous materials and mixtures. Fundamental mechanics for elastic and inelastic materials and basic theories associated with mechanical data analyses and designs. Recent advances and significant research outcomes for further discussions. Applications of theories to laboratory and field testing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 872 Pavement Design and Evaluation****Crosslisted with:** CIVE 472**Prerequisites:** CIVE 334.**Description:** Thickness design of flexible and rigid pavement systems for highways and airports; design of paving materials; evaluation and strengthening of existing pavements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475, POLS 875**Prerequisites:** Senior standing.**Notes:** Capstone course.**Description:** Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**CIVE 880 Engineering Economy****Prerequisites:** Permission**Description:** Economic comparison of engineering alternatives. Equipment selection and replacement, depreciation, break-even points, and minimum-cost points.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC

CIVE 881 Computational Problem Solving In Civil Engineering

Crosslisted with: CIVE 481

Prerequisites: MATH 221 and CSCE 155A or 155E or 155H or 155N

Description: Introduction of numerical methods to solve problems in civil engineering, including finding roots of equations, solving linear algebra equations, optimization, curve fitting, numerical differentiation and integration, and finite difference method. Computational methods in numerical integration, matrix operations and ordinary differential equations as they apply to civil engineering problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 898 Special Topics in Civil Engineering

Crosslisted with: CIVE 498

Prerequisites: Permission.

Description: Special problems, topics, or research in civil engineering.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

CIVE 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

CIVE 916 Environmental Law and Water Resource Management Seminar

Crosslisted with: NRES 916

Prerequisites: Permission

Description: An interdisciplinary seminar with the Department of Civil Engineering. Contemporary environmental issues and water resource management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 940 Behavior of Steel Members

Prerequisites: CIVE 446/846

Description: Behavior and/or design of structural steel members and their connections. Torsion effects on open and closed thin walled members. Frame buckling and stability considerations in structural steel frames. Dynamic analysis and seismic design considerations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 945 Structural Analysis and Design for Dynamic Loads

Prerequisites: CIVE 443/843 and CIVE 842

Description: Behavior of structural materials and systems under dynamic loads. Analysis and design for dynamic loads. Computational and analytical techniques. Selected laboratory demonstrations of the dynamic behavior of structural systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 948 Blast-resistant Structural Design

Prerequisites: CIVE 842

Description: Introduction to explosion effects. Air-blast. Fragmentation. Single-Degree-of-Freedom (SDOF) analysis. Equivalent SDOF systems. Pressure-impulse diagrams. Energy solutions. Steel design. Reinforced concrete design. Masonry design. Progressive collapse. Windows and doors.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 949 Steel Bridge Design

Prerequisites: CIVE 436/836 and CIVE 446/846.

Description: Analysis and design of steel bridges for short-, medium-, and long-span road and water crossings. Stringer bridges. Truss, arch, cable-stayed, and suspension bridges. High performance steel and accelerated construction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 954 Advanced Hydraulics

Prerequisites: CIVE 854 and permission

Description: Advanced studies involving pipe and culvert hydraulics, rapidly-varied flow in open channels, sediment transport, river mechanics, control, and design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 955 Solute Movement in Soils

Crosslisted with: AGEN 955, AGRO 955, GEOL 985

Prerequisites: MATH 208; AGRO 861 or GEOL 888 or MSYM 852 or CIVE 858

Description: Examination of the theory and experimental evidence available to characterize the movement of chemicals in soil. Both saturated and unsaturated flow conditions examined. Initial presentation of basic theoretical concepts. Remainder of class a discussion of the literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CIVE 957 Modeling Vadose Zone Hydrology**Crosslisted with:** AGEN 957, BSEN 957, GEOL 957**Prerequisites:** MATH 221/821 or equivalent. AGEN/BSEN 350 or NRES 453/853 or equivalent.**Notes:** Typically offered spring semester in even years.**Description:** Principles and modeling of fluid flow and solute transport in the vadose zone. Topics include hydraulic properties of variably saturated media, application of Darcy's Law in variably saturated media, hydrologic and transport processes in the vadose zone, and solution of steady and unsteady flow problems using numerical techniques including finite element methods. Contemporary vadose zone models will be applied to engineering flow and transport problems. Review and synthesis of classic and contemporary research literature on vadose zone hydrology will be embedded in the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**CIVE 958 Contaminant Transport in Porous Media****Prerequisites:** Permission.**Description:** Theory of flow and contaminant transport in porous media including groundwater flow, multiphase flow, equilibrium contaminant distribution, reactive transport of contaminants, and colloid transport in porous media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 961 Mass Transit Systems****Prerequisites:** Permission**Description:** The place of mass transit in solving urban transportation problems: transit system and terminal characteristics and planning criteria. Speed, capacity, accessibility, and operation of mass transit systems. Future prospects in transit technology and case studies of existing systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 962 Application of Geographic Information Systems GIS to Transportation****Prerequisites:** Permission.**Description:** Geographic Information Systems (GIS) structure, functions, and concepts such as spatial data models, relational databases, and spatial analyses. GIS project planning, management, and applications to transportation-related issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 963 Highway Safety Data Analysis****Prerequisites:** STAT 801A and permission**Description:** Highway safety issues and appropriate accident data analyses. Quantify changes in safety when modifications are made to highways in an effort to enhance safety. Judge reported safety improvements and carry out appropriate analyses for assessing the effectiveness of safety improvements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 964 Theory of Traffic Flow****Prerequisites:** STAT 801A and CIVE 866**Description:** Analysis of traffic characteristics as applied to traffic engineering facility design and flow optimization. Capacity of expressways, ramps, weaving sections, and intersections. Analytical approaches to flow analysis, queueing theory, flow density relationships, and traffic simulation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 965 Traffic Control Systems****Prerequisites:** Permission**Description:** Principles of traffic control. Design an analysis of intersection, arterial street, network, and freeway control systems. Traffic surveillance and driver information systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 966 Transportation Planning and Economics****Prerequisites:** Permission.**Description:** Community growth and development based on planning decisions regarding land use whereby transportation facilities are fitted to land use. Economic studies that consider the consequences to transportation agencies, users, and nonusers. Agency expenditures, capital outlay and annual expenses for maintenance and operations. User consequences such as vehicle operating costs; commercial time costs; accident costs; discomfort and inconvenience costs; and assignment of money valuations to pleasure, recreation, and culture. Nonusers consequences such as cost reductions or increases in public services; increases in value of crops and natural resources where areas become more readily accessible; changes in business and industrial activities; and increase or decrease of residential property values.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CIVE 967 Analysis and Design of Transportation Supply Systems****Prerequisites:** Permission**Description:** Operations research techniques for modeling system performance and design of transportation services. Routing and scheduling problems. Network equilibration and partially distributed queueing systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CIVE 989 Seminar in Civil Engineering**Prerequisites:** Permission**Description:** Current topics, research projects, and review of current literature in the various areas of civil engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Format:** LEC**CIVE 998 Special Problems in Civil Engineering****Prerequisites:** Permission**Description:** Reading and evaluation of technical publications concerned with theory and/or experimental data. Subsequent assignments are coordinated with the student's particular interests in his/her field of specialization.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**CIVE 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Classics (CLAS)

CLAS 806 Visualizing the Ancient City**Crosslisted with:** AHIS 406, AHIS 806, ANTH 406, ANTH 806, CLAS 406**Prerequisites:** Junior standing.**Notes:** Recommend some background knowledge of ancient art, history, or languages, a general background course such as AHIS 101, ANTH 252, CLAS 209/CLAS 210, or any of the courses listed in the Archaeology or Digital Humanities minors. Computer/design skills welcome but not necessary.**Description:** A new approach to looking at the history and development of ancient cities, combining history and archaeology with digital methods, in particular 3D modeling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CLAS 807 Early Christianity****Crosslisted with:** CLAS 307, HIST 307, HIST 807, RELG 307**Description:** Life, literature, thought, and institutions of the Christian movement from Jesus to Constantine. A critical, historical approach to the sources in English translation and how they reflect the interaction of Christian, Jew, and pagan in late antiquity. Includes the historical Jesus vis-a-vis the Christ of Faith, the impact of Paul's thought, the formation of Christian dogma, methods of interpreting canonical and extra-canonical Christian literature, the problem of heresy and orthodoxy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**CLAS 809 Religion of Late Western Antiquity****Crosslisted with:** CLAS 409, HIST 409, HIST 809, RELG 409**Description:** Examination of the religious institutions, philosophies, and lifeways of the Hellenistic Age from Alexander to Constantine. Includes civic religion of Greece and Rome, popular religion, mystery cults, Judaism, Christianity, popular and school philosophies (Platonism, Aristotelianism, Epicureanism, Cynicism, Stoicism), Gnosticism. History, interrelationships, emerging world view of these movements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**CLAS 810 Gnosticism****Crosslisted with:** CLAS 410, RELG 410**Description:** Examination of the nature, history, literature, ritual, and impact of the classical Gnostic religions, 100 BCE to 400 CE. Extensive reading of original Gnostic treatises in English translation, with particular attention to their appropriation and transformation of earlier Jewish, Christian, and pagan religious and philosophical traditions. The principal Gnostic schools to be treated are Simonians, Sethians, Valentinians, Hermetics, and Manichaeans.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CLAS 838 Archaeologies of Europe****Crosslisted with:** ANTH 438, ANTH 838, CLAS 438**Description:** Survey of the material remains of Europe and of the various approaches to the study of the European past.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Archaeology**CLAS 840 Gender and Sexuality in the Ancient World****Crosslisted with:** CLAS 440, WMNS 440, WMNS 840**Description:** Ancient Greek and Roman evidence pertaining to the fields of women's studies, gender studies, and the study of sexuality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CLAS 861 Geospatial Approaches in Digital Humanities and Social Sciences****Crosslisted with:** ANTH 461, ANTH 861, CLAS 461, GEOG 461, GEOG 861, HIST 461, HIST 861**Description:** Study of geographic concepts and critical analysis of applications of Geographic Information Systems (GIS) in humanities and social sciences and application of geospatial tools for humanities and social science research; learn how to collect, manage, analyze, and visualize spatial data for real-world projects**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques

CLAS 883 Classical Drama**Crosslisted with:** CLAS 483, ENGL 440, ENGL 840**Prerequisites:** Senior standing.**Description:** Greek and Roman tragedy and comedy in translation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies

Communication Studies (COMM)

COMM 827 Instructional Communication**Crosslisted with:** COMM 427, TEAC 429, TEAC 829**Prerequisites:** COMM 101.**Description:** Advanced introductory course in instructional communication, focusing on understanding variables associated with the communication process in instructional settings and managing instructional communication more effectively. Provides an experimental and a cognitive understanding of the role of communication in the instructional process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 830 Political Communication****Crosslisted with:** COMM 430, POLS 430, POLS 830**Prerequisites:** 12 hrs communication studies.**Description:** Role of communication in the political process, with emphasis on communication strategies in political campaigns. Includes communication variables important in the political process, an application of communication theory and principles to political rhetoric, and analysis and criticism of selected political communication events.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**COMM 850 Seminar in Gender and Communication****Description:** Relationship between gender and communication. Theories and research on gender and communication, serving as the basis for studying the interrelationships among language, social reality, sex role stereotypes, and cultural values.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 852 Media and Culture****Description:** Theories of mass media, digital media and culture as the basis for investigation of human communication in a variety of contexts and activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 870 Interpersonal Communication Theory****Description:** In-depth exploration of interpersonal communication theory and research across contexts. How people interact to create, maintain, and dissolve relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 886 Organizational Communication****Description:** Principles and theories relevant to communication behavior within organizations which can be used to guide the way people communicate in organizations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 898 Special Topics****Description:** Topic varies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**COMM 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**COMM 900 Introduction to Graduate Studies in Communication****Description:** Systematic introduction to the discipline of communication studies, focusing upon the various dimensions of scholarship essential to successful pursuit of an advanced degree in communication studies. Function of communication studies research, surveys major research trends of the discipline, examines epistemology from a human communication perspective, and helps to develop writing and research skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 905 Influential Books in Communication Studies****Description:** Study of Historical and foundational texts with opportunity to analyze texts tailored to students' specialization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**COMM 911A Classical Rhetoric****Description:** In-depth study of the evolution of rhetorical theory from its origin to St. Augustine, with emphasis on rhetorical theory in Classical Greece and Rome.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

COMM 911B Modern Rhetoric

Description: In-depth study of the evolution of rhetorical theory from the middle ages through the modern period, with emphasis on eighteenth- and nineteenth-century British rhetorical thought.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 911D Contemporary Rhetoric

Description: In-depth study of the development of rhetorical theory in the twentieth century.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 927A Seminar in Instructional Communication

Description: Literature and research pertaining to the basic psychological concepts, principles, and communication skills employed in effective instruction. Communication as it applies to instruction by studying and applying theories of learning and communication to instructional contexts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 927B Seminar in Instructional Communication Research

Description: Review and analyze the seminal and current research related to communication in instructional contexts. Foundation for developing theory and generating original research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 927D Current Issues in Instructional Communication

Description: Investigation of current topics in instructional communication and speech communication education. Specific content depends on the semester the course is offered and the research interests of the instructor assigned.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 930 Social Identity and Intergroup Communication

Description: Introduction to the theories, concepts, and research on intergroup communication, personal and social identity, and social categorization. Communicative processes associated with defining self and others including social comparison, prejudice and discrimination, and social conflict.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 950D Special Topics in Rhetoric and Public Culture

Description: Investigation of current topics in the research between cultural processes and human communication.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 953 Seminar in Political Communication

Description: In-depth study of the influences of communication behavior on political events. Communication within political campaigns and governmental processes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 954 Seminar in Health Communication

Description: An introduction to the foundational and contemporary issues of health communication, including illness identity, patient-provider communication, family influence, social support, community-based interventions, health disparities, and future directions for the subfield.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 970A Seminar in Interpersonal Communication

Description: Fundamental concepts, theories, and research in interpersonal communication. Selected problems and contemporary research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 970B Seminar in Family Communication

Description: Concepts, theories, and research in family communication. Selected problems and contemporary research across a variety of family contexts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 970D Current Research in Interpersonal Communication

Description: Surveys current research in interpersonal communication. Issues, direction and methodology in interpersonal communication.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 971 The Dark Side of Interpersonal and Family Communication

Description: In-depth exploration of aspects of interpersonal and family communication traditionally considered negative and destructive to understand the potentially (dys)functional aspects of these behaviors and processes. Focuses on impact on human health.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 973 Narratives, Health, and Relationships

Description: Explores theory and research that situates narratives as central to making sense of, creating, and coping with our relational lives. Emphasis on how narratives and storytelling are linked to mental, physical, and relational health both within and outside the context of health care.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 981 Rhetorical Criticism

Description: Advanced course in rhetorical criticism and textual analysis. Designing and conducting an in-depth research perspective from a critical perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 983 Introduction to Quantitative Research Methods

Description: Introduction to quantitative research methodology and analysis. Paradigmatic assumptions, reading and interpreting quantitative research studies, and quantitative research design and analysis. Posing research questions and/or hypotheses, quantitative measurement and study design, data collection, and univariate statistical analyses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 984 Interpretive Research Design

Description: Theory and practice of interpretive research methodologies and methods. Individual and/or group research projects are planned, conducted, and reported.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 985 Cultural Criticism

Description: Advanced course focusing on the critical analysis of cultural artifacts, especially upon the relationship of media, language, and culture. Designing and conducting a research project from a cultural studies perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 986A Perspectives in Organizational Communication

Description: Examines post-positivist, interpretive and critical perspectives on organizational communication research and their use to creatively explore problematic communication situations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 986B Problems and Issues in Organizational Communication

Description: Examines consequential problems of communication in and around contemporary organizations. Recent subjects include communicating and organizing for social change.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 986D Current Research in Organizational Communication

Description: Explores current research foci of the faculty. Recent subjects include the development of a communication perspective on globalization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

COMM 996 Research Problems Other Than Thesis

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

COMM 998 Special Topics in Communication Studies

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

COMM 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Community and Regional Planning (CRPL)

CRPL 800 Introduction to Planning

Crosslisted with: CRPL 400

Description: Field of community and regional planning introduced and studied in relation to the history of cities, urbanization, and regionalization. Origins and evolution of American urban and regional planning practice. The planning process as a response to social, political, physical, and economic factors is analyzed. Introduces the community comprehensive planning process, plan implementation, and functional areas of planning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRPL 802 Planning Theory

Prerequisites: or parallel: CRPL 800

Description: Linkages between knowledge and organized action in planning practice are analyzed in terms of philosophical underpinnings, decision theory, programming, policy formulation, politics, goals, values, and social change. Historical traditions of contemporary planning theory. The identities, roles, and relationships of planners with society.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRPL 804 Legal Aspects of Planning**Prerequisites:** or parallel: CRPL 800**Description:** Applications of constitutional, common, administrative, and statutory law in the planning process are studied. Roles of the branches of American government in the regulation and control of land use and development, as well as in the planning, development, and delivery of public services and facilities. Legal theories, issues, cases, and applications relevant to professional planning practice, as well as the legal responsibilities of participants in the planning process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 810 Qualitative Techniques for Planners****Description:** Applied qualitative research techniques. Interpret verbal data generated by the community. Organize, categorize, and analyze the words (data) into critical empirical comparable units of analysis. Optimize listening skills; techniques to incorporate qualitative community concerns into the planning process; and epistemological insights on how to combine data obtained from divergent research methods into a single research project.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 820 Grant Writing and Fund-raising****Crosslisted with:** CRPL 420**Prerequisites:** Senior standing.**Description:** Introduces and familiarizes the student with the theory and practice of fund-raising and grant writing. Overview of the principles and concepts of philanthropy and the basic issues of fund-raising. Skills of writing a case statement, conducting a donor search and analysis, designing a fund-raising vehicle, and writing grant applications in "real world" situations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 830 Planning with GIS****Prerequisites:** Admission to the MCRP program**Description:** Theory and practice of geographic information systems use in planning. Selection and use of computer software and data for problem solving and decision making in community and regional planning. Specific planning-related applications of geographic information systems, spreadsheet modeling, and data base management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CRPL 432, CRPL 832; CRPL 840; CRPL 990**CRPL 832 Advanced Spatial Analysis with GIS****Crosslisted with:** CRPL 432**Prerequisites:** CRPL 830 or introductory level GIS or equivalent**Description:** Provides advanced level instruction on the knowledge and methods needed for the complex spatial analysis in developing and utilizing geographic information in planning. The main subjects to be covered are advanced analysis with raster, network analysis, 3D modelling and visualization, spatial-statistical analysis, and geodatabase management. This course also includes wide variety of real world settings for GIS analysis and spatial decision making in planning - from a broad and practical perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 833 GIS in Environmental Design and Planning****Crosslisted with:** CRPL 433**Prerequisites:** Permission**Description:** This course provides an introduction of contemporary theories, principles, and methods of environmental survey and analysis in environmental design and planning. It includes an analysis of the critical environmental elements, their interrelationships, and human interactions in environmental design and planning. This course emphasizes synthesizing Geographical Information System (GIS) spatial analysis skills and environmental analysis knowledge into a coherent concept for practical applications. By the end of the course, it is expected that students will have the ability to use GIS to perform environmental spatial analysis and site analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 840 Planning Methods and Analysis****Prerequisites:** Principles of statistics course; CRPL 800; CRPL 830; community and regional planning major**Description:** Analytical methods and techniques for research, problem solving, and decision making are studied and applied within the context of the planning process. Statistical analyses; forecasting methods; optimization techniques; models and simulation techniques; and methods of demographic, economic, land use, and policy analyses are studied in relation to community and regional planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CRPL 990**CRPL 841 Researching Quality of Life****Crosslisted with:** CRPL 441**Description:** The central goal of the course is to help students think critically about issues related to people's quality of life in contemporary communities. How the quality of life of individuals and groups is influenced by the social, psychological, physical, economic and demographic conditions in their environment. It teaches how to systematically carry out an applied research project—how to study a research problem, analyze data, and effectively communicate the results of the research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CRPL 860 Planning and Design in the Built Environment**Crosslisted with:** CRPL 460**Prerequisites:** Senior standing.

Description: Introduces principles and practices of planning, design, and implementation for multiple-structure built environments. Influences of physical, social, environmental, and economic factors upon planned and designed environments. Various planning and design methods, processes, and products introduced. Means of project implementation explored, and examples of existing and proposed projects studied.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 870 Environmental Planning and Policy****Crosslisted with:** CRPL 470**Prerequisites:** Senior standing.

Description: Introduces environmental planning, including its history and origins. Major environmental issues throughout the world, and the roles of planning in addressing these problems. Environmental planning process and environmental legislation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 871 Environmental Impact Assessment****Crosslisted with:** CRPL 471

Description: This class provides an overview of "environmental impact assessment" in the United States. This course explores how to conduct environmental impact assessments, environmental impact analysis, review of environmental impact statements, and use of various regulatory review processes. It emphasizes the significant environmental legislation - National Environmental Policy Act (NEPA). NEPA applies to all federal agencies and most of the projects and decisions. This class introduces the background and implementation of the NEPA, and explains the preparation of environmental impact statements (EISs). This class covers the major themes of environmental impacts assessment, including air pollution, water quality, land resources, cultural resources, archaeology, traffic, noise, transportation, and so on. This interdisciplinary class fits students in all departments, including Natural Resources Management, Environmental Studies, Civil Engineering, Wildlife and Fisheries, Planning, Landscape Architecture, Architecture, Public Policy, and others.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 872 Hazard Mitigation Planning****Crosslisted with:** CRPL 472

Description: Overview of theory, principles, methodology, and procedures of planning for hazards, disasters, and emergencies in communities and regions, with the goal of reducing vulnerabilities and increasing resiliency in the disaster management cycle: mitigation, preparation, response, and recovery.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475, POLS 875**Prerequisites:** Senior standing.**Notes:** Capstone course.

Description: Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**CRPL 880 Economic Development Planning****Crosslisted with:** CRPL 480**Prerequisites:** Senior standing.

Description: Introduces the theory and principles of economic development planning. Concepts, analytical approaches, and theories of economic growth of local communities introduced. Consideration of local economic development plans for small communities. International perspectives of economic development.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 881 Planning in Developing Countries**

Description: Introduction to the comparative study of urbanization and planning in developing countries. Social, economic, and spatial organization of Third World cities, including international trends, theories of development, life in these cities, and how the people and governments of Third World countries attempt to cope with their problems and plan for a better future.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 889 Urbanization of Rural Landscapes****Crosslisted with:** AGRO 489, AGRO 889, CRPL 489, HORT 489, HORT 889**Prerequisites:** Senior standing or graduate standing.

Description: Development converts rural landscapes into housing, roads, malls, parks, and commercial uses. This process fragments landscapes and changes ecosystem functions, drives up land prices, and pushes agriculture into more marginal areas. This multi-disciplinary, experiential course guides students in learning about the urbanization process, the impacts on landscapes, people, and the community, and the choices that are available to informed citizens.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CRPL 890 Professional Seminar**Prerequisites:** Community and regional planning major**Description:** Diverse issues relating to contemporary professional planning practice are studied through abbreviated case studies and presentations by visiting specialists and participants in the planning process. Interrelated social, economic, political, and physical factors affecting specific planning situations. Current and emerging roles for professional planners.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CRPL 895 Selected Topics in Community and Regional Planning****Crosslisted with:** CRPL 495**Prerequisites:** Senior standing.**Description:** Aspects of community and regional planning not covered elsewhere in the curriculum are presented as the need arises.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**CRPL 896 Special Problems in Community and Regional Planning****Crosslisted with:** CRPL 496**Prerequisites:** Senior standing and permission.**Description:** Individual or group investigations of problems relating to community and regional planning.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** IND**CRPL 897 Planning Internship****Prerequisites:** Community and regional planning major and permission**Description:** Supervised practical experience in a planning-related organization.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** IND**CRPL 898 Professional Project****Prerequisites:** MCRP degree candidate and permission of department graduate committee**Description:** Professional project is a non-thesis culmination of the MCRP degree program. The professional project emulates professional planning practice and is pursued individually by the student with supervision by a faculty advisory committee.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**CRPL 899 Masters Thesis****Prerequisites:** Admission to MCRP degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**CRPL 900 Professional Planning Practice****Prerequisites:** Prereq or parallel: CRPL 800**Description:** Current concepts, ideas, and issues relating to professional planning practice are studied. Contexts of planning practice, the professional planner's relationship to society, ethics in professional planning practice, and political and organizational behavior in plan making and policy implementation. Roles of citizens, client groups, and consultants in the planning process. Forms of collaborative problem solving, including mediation and negotiation. Planning office and project management issues and approaches, including personnel administration and project financing and budgeting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRPL 990 Planning Studio****Prerequisites:** CRPL 800, 830, 840; MCRP degree candidate**Description:** Application and synthesis of multi-disciplinary philosophies, theories, methods, analyses, and techniques of planning in the context of contemporary complex planning projects. Individual and team approaches pursued in specific project contexts for survey research, definition of research questions and hypotheses, analyses, creative problem solving, formulation and evaluation of alternatives, plan making, and development of implementation strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Community Development (CDEV)

CDEV 810 Community Development Orientation**Prerequisites:** Must be enrolled in the Community Development Masters Degree program.**Notes:** Course is taught by faculty from South Dakota State University.**Description:** Seminar will serve as an orientation to on-line learning and communities of practice to provide students with the foundations to community development as an academic discipline; a science-based profession; and a skills and knowledge-based practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

CDEV 811 Community and Natural Resource Management

Description: Community and Natural Resource Management – Introduction to factors involved in community resource management. Included in the course are theoretical frameworks, methodological investigation and applied practices to enhance the ability of community development professionals to work with their communities to plan, develop, and monitor the conversation and development of natural resources with multiple functions. Course is taught by faculty from South Dakota State University or Iowa State, and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master’s Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 812 Community Development I: Principles & Strategies of Community Development

Description: Analyzes principles and practices of community change and development, beginning with definitions of community role of communities in social and economic change. Using case studies and the students’ communities of reference, the course will relate Community Development approaches to conceptual models from diverse disciplines. Conceptual models include conflict, neo-classical economic growth, participatory democracy, and others. Students will be exposed to professional practice principles and will leave the course having constructed their personal framework for the practice of community development. Course will be taught by North Dakota State and Iowa and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master’s Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 813 Community Development II: Organizing for Community Change

Description: This course will examine the role of civil society in community planning efforts and offer students a comparative approach to planning theories and approaches. It will also focus on change within communities and the roles of government, planners, and citizens in reacting to or shaping change. Students will have an opportunity to explore current issues related to planning and dealing with change by examining controversial practices such as covenants and land trusts, as well as by studying various community responses to change. Students will understand how citizens, firms and governments act to improve their community and region; the structure and implications of power; the relation between social relationships and economic activity, coalition building, concepts of inclusiveness (class, gender, ethnicity, geography), voice and conflict and its management in communities and regions. The course will cover dimensions of social capital and the context of change. Students will learn to use this knowledge to promote equitable change at the community and regional level. They will study the implications of economic and demographic shifts on strategies and tactics for change and explore various resources for supporting these efforts. Course will be taught by Iowa State and will be offered summer semester. To enroll, students must be enrolled in the Community Development Master’s Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 814 Community and Regional Economic Analysis

Description: A firm grounding in the reality of the local economy is necessary for successful programs in community economic development and for designing successful state and local policy and programs in economic development. The course introduces concepts of communities and regions, theories of economic growth, drivers of economic growth, the economic base of a community sources of growth or decline in the community, roles of local government and institutions, analytical tools, and strategies for local economic development. Course will be taught by Nebraska and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master’s Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 815 Community Analysis (Introduction to Methods)

Description: Provides an introduction to research methods relevant to community development. Course topics include how to formulate and begin a research effort, methods of data collection and how conceptual frameworks are used to develop the questions and analyze data. Also included are strategies for reporting findings and applying findings in community action. The course will also look at methods of evaluating the entire research process. Significant attention is paid to issues of research ethics and inclusiveness throughout the course. Course will be taught by South Dakota State and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master’s Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 816 Nebraska Rural Government Law Fundamentals

Description: A practical introduction to county and rural community government in Nebraska. Topics include state law and local governments; local government functions; land use regulation and zoning; drinking water and wastewater regulation; and local government taxes and spending.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

CDEV 817 Nebraska Rural Government Finance Fundamentals

Description: A broad overview of how local government is financed in Nebraska, specifically the role of property taxes in financing K-12 education, and school finance options lessening the reliance upon property taxes. CDEV 816 recommended.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

CDEV 818 Community Engagement**Crosslisted with:** ALEC 818

Description: A foundational knowledge of community engagement. This will include understanding a community's readiness to change; strategies to engage community's members and strategies to determine goals and indicators to achieve change. Participants will review and critique various community engagement and readiness processes, gaining an understanding of approaches advantages and limitations. Through case studies, experiential learning and discussions, participants will develop a skillset for community engagement processes that lead to long term change.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CDEV 819 Community Action Strategies**

Description: A foundational understanding of community action planning. Participants will review and critique various community action planning processes, gaining an understanding of process advantages and limitations. Through case studies and discussions, participants will develop a skillset for community planning that clarifies what will be done and resources needed to accomplish the goals for long-term impacts.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**CDEV 820 Economic Development Strategies and Programs**

Description: Course will cover the most widely used strategies and programs for economic development within an action planning process. Retention and expansion of business and industry, retail development and downtown revitalization, incubating new firm creation, industrial attraction, and tourism development all will be covered. These are both strategies and programs that utilize all forms of capital from all sources, the private, public, and nonprofit sectors. Students will study the organized efforts to plan, build, and manage each program. Course will be taught by Iowa and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CDEV 821 Community & Regional Economic Analysis II**

Description: Substantive grounding in the theories and practice of measuring community economic dynamics; build solid foundation skills for applied community economic analysis. Course will be taught by Iowa and will be offered Summer semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CDEV 822 Building Native Community & Economic Capacity**

Description: Non-western approaches to helping Native communities build their capacity. Students will learn to take a participatory, culture-centered, and strength-based approach to development. Course will be taught by South Dakota State and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CDEV 823 Housing and Development Programs**

Description: Review and evaluation of historical and current housing issues, production, and financial systems, including consideration of racial, ethnic, income, and gender issues as they relate to the role of housing developments and programs in community development. Course will be taught by South Dakota State or Kansas State and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CDEV 824 Tourism and Community Development**

Description: Assess the relation between tourism development initiatives and their contribution to community sustainability and development. Students will learn a variety of tourism models, apply these models in their local context, critically assess the viability of tourism in their area, and compose a proposal for tourism development and policy. Course will be taught by South Dakota State and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CDEV 825 Sustainable Economic Development**

Description: Overview of the connections between communities and their local systems and how they work together in affecting long-term community and economic development. Through course assignments, participants will be introduced to the complex issues facing local communities, from human capital and environmental concerns to infrastructure and economic development. Tools and strategies for addressing these issues will be a focus of the course lectures and readings.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

CDEV 826 Fundamentals of Business Analysis

Description: Basic overview of business development skills for professionals who manage economic development organizations and provide initial business analysis for consideration of community investments. Through assigned case studies and course assignments, participants will be able to analyze key performance statements and ratios to help determine viability of business enterprises within their community. The course will engage participants through the use of group discussions based on readings, case studies and course assignments.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

CDEV 827 Community Workforce Development

Description: The course is designed to expand the student's awareness and knowledge of current workforce issues and trends and then apply the new knowledge to a real-life community situation. The course project, which will be identified by the participant, is a way to add meaning, to problem-solve and also reflect on the new learning in an integrated manner. The course will engage participants through the use of group online discussions and invited speakers.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

CDEV 830 Grant Development & Management

Description: This course will focus on the intricacies of grantsmanship. Topics covered will include identification of funding sources, procedure for proposal preparation, composition of grants, and the affects of organizational and personal linkages. Assignments include proposal preparation, grant application based upon a RFP or a continuous funding sources, addendum or market analysis, and an on-line presentation. Course will be taught by Kansas State and will be offered summer semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 831 Not For Profit Management

Description: This course provides an overview of non-profit management with a consideration of the appropriate role of non-profit organizations as agents of community development in addressing various social problems. It focuses on the growth of the nonprofit sector as a major part of economy of the U.S. and the impact of the sector on the community as a source of citizen empowerment. This course will focus on the structure of the non-profit sector, its tax status, fundraising, volunteer and Board management, the relationship with government and private counterparts, and issues and challenges in nonprofit management. Course will be taught by one of the participating institutions. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 832 Community Leadership & Capacity Building

Description: This course will explore the various approaches to leadership and leadership development, evaluation of leadership projects, and the relationship of leadership to community capacity building. Topics include defining leadership, challenges and opportunities related to leadership, designing and development leadership, impact of leadership training on community development, and evaluation of leadership development programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 833 Evaluation of Organizations and Programs

Description: Introduction to philosophy, techniques, and methodologies of organizational and program evaluation. Topics covered include overview of program evaluation and theory, techniques to evaluate program processes and performance, evaluation designs, assessing program efficiency, models to diagnose organizations, and methods to assess organizational performance. Course will be taught by South Dakota State and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 840 Introduction to Native Community Development

Description: Base knowledge course for students currently working within or in partnership with Native communities or considering working in this area. Students will develop a basic understanding within the context of community development of the diversity of tribal structures and cultures and the unique history and jurisdictional considerations of these nations. Course topics will include: working with tribes, Federal and Indian relations, and governance and cultural issues. Students taking this course will complete a holistic analysis and conceptual mapping of a tribe. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission. This course is required before students may take other courses in this track.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 850 Immigrants in Communities

Description: Course work will address the considerable demand across the region for such a course from individuals working in communities with new immigrant populations. Many areas in the US experience an increasing immigrant population who represent an important economic engine, but may also be a source of concerns about community continuity and change. This course will be available to practitioners who are facing these issues in their communities and want to frame positive community action. Populations are aging in all of the OECD countries, especially in rural areas. Lower fertility and out-migration of young people is off-set in many counties are off-set by new immigrants. While welcomed by the economic interests, they are seen a putting pressure on social services, of questionable legal status, and of being different. The course will take a comparative approach to how different countries and different communities have responded to new immigrants, based on literature from Australia, Europe, Canada, and the U.S., with reference to Japan and New Zealand. Class members will carry out case studies of the inclusion of immigrants in their own community and an action plan for increasing inclusion to contribute to the economic vitality of that place. Course will be taught by Iowa and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 883 Ecological Economics

Crosslisted with: AECN 883, NRES 883

Prerequisites: AECN 141 or ECON 212 or equivalent

Description: A synthesis across the notion of "utility" as represented in traditional environmental and natural resource economics, "ecology" in ecological economics, and "community" in behavioral economics. Ideas from thermodynamics with a focus on renewable resources. Development, organization, and enhancement of eco-business, eco-industry, eco-government and eco-communities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 884 Indian Country Agriculture and Natural Resources

Description: Historical and contemporary issues related to natural resource management on Native American Lands. Students will study a variety of ecological settings across naïve American lands, and analyze tribal sovereignty as it relates to land tenure and water rights. Federal, State and Tribal policies concerning agriculture, fisheries, wildlife, parks and wilderness co-management, water supply and quality, emerging zoonotic diseases, and agri-security will be debated. Philosophical and economic arguments concerning natural resource conservation, preservation and extraction will be explored. Course will be taught by South Dakota State and will be offered spring semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 885 Sustainable Communities

Description: Links the management of natural capital to other community-based actions around resource allocation and the impacts on quality of life. The literature on community-based natural resource management will be examined and alternative ways of valuing natural capital will be assessed. Contrasting theories of the role of natural capital in communities and human society will be linked to their implications for community sustainability in terms of economic vitality, social well-being, and ecosystem health. Course will be taught by Iowa and will be offered fall semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 886 Policy & Politics of Coastal Areas

Description: Focuses on coastal zone management policy issues. Students learn more about the fragile coastal environment and what they can do to protect it. Course will be taught by Iowa and will be offered summer semester. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CDEV 894 Practicum/Creative Component/Thesis in Community Development

Description: The Community Development On-line Master's Program has a research element in addition to the required number of credit hours. Because of the variety of career and academic opportunities that may result from this degree program, students have considerable leeway in choosing projects that suit their programs of study and also fit their future professional or academic goals. Some universities allow Master's candidates to choose either the creative component or the thesis. To enroll, students must be enrolled in the Community Development Master's Degree program or obtain permission.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Computer Science and Engineering (CSCE)

CSCE 810 Information Retrieval Systems

Crosslisted with: CSCE 410

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Description: Outline of the general information retrieval problem, functional overview of information retrieval. Deterministic models of information retrieval systems; conventional Boolean, fuzzy set theory, p-norm, and vector space models. Probabilistic models. Text analysis and automatic indexing. Automatic query formulation. System-user adaptation and learning mechanisms. Intelligent information retrieval. Retrieval evaluation. Review of new theories and future directions. Practical experience with a working experimental information retrieval system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 910

CSCE 811 Data Modeling for Systems Development

Crosslisted with: CSCE 411

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Description: Concepts of relational and object-oriented data modeling through the process of data model development including conceptual, logical and physical modeling. Techniques for identifying and creating relationships between discrete data members, reasoning about how data modeling and analysis are incorporated in system design and development, and specification paradigms for data models. Common tools and technologies for engineering systems and frameworks for integrating data. Design and analysis of algorithms and techniques for identification and exploration of data relationships, such as Bayesian probability and statistics, clustering, map-reduce, and web-based visualization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 812 Data Visualization

Crosslisted with: CSCE 412

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; MATH 314.

Description: Fundamentals and implementations of data visualization techniques. Programming skills and practices in interactive visualization applications. Visualization foundations, human perception for information processing, and visualization techniques for different data types, such as scalar-field data, vector-field data, geospatial data, multivariate data, graph/network data, and text/document data. Advanced visualization algorithms and topics as time permits.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

CSCE 813 Database Systems

Crosslisted with: CSCE 413

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Notes: Involves practical experience with a working database system.

Description: Data and storage models for database systems; entity/relationship, relational, and constraint models; relational databases; relational algebra and calculus; structured query language; Logical database design: normalization; integrity; distributed data storage; concurrency; security issues. Spatial databases and geographic information systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 913; CSCE 914

CSCE 821 Foundations of Constraint Processing

Crosslisted with: CSCE 421

Prerequisites: A grade of "P" or "C" or better in CSCE 235 and CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Description: Constraint processing for articulating and solving industrial problems such as design, scheduling, and resource allocation. The foundations of constraint satisfaction, its basic mechanisms (e.g., search, backtracking, and consistency-checking algorithms), and constraint programming languages. New directions in the field, such as strategies for decomposition and for symmetry identification.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 921

CSCE 823 Design and Analysis of Algorithms

Crosslisted with: CSCE 423

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Description: Mathematical preliminaries. Strategies for algorithm design, including divide-and-conquer, greedy, dynamic programming and backtracking. Mathematical analysis of algorithms. Introduction to NP-Completeness theory, including the classes P and NP, polynomial transformations and NP-complete problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 923; CSCE 924

CSCE 824 Computational Complexity Theory

Crosslisted with: CSCE 424

Prerequisites: A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.

Description: Turing machine model of computation: deterministic, nondeterministic, alternating, probabilistic. Complexity classes: Time and space bounded, deterministic, nondeterministic, probabilistic. Reductions and completeness. Complexity of counting problems. Non-uniformity. Lower bounds. Interactive proofs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 825 Compiler Construction**Crosslisted with:** CSCE 425**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Review of program language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 828 Automata, Computation, and Formal Languages****Crosslisted with:** CSCE 428**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Introduction to the classical theory of computer science. Finite state automata and regular languages, minimization of automata. Context free languages and pushdown automata, Turing machines and other models of computation, undecidable problems, introduction to computational complexity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 830 Computer Architecture****Crosslisted with:** CSCE 430**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; Coreq: MATH/STAT 380, ECEN 305 or RAIK 270H**Description:** Architecture of single-processor (Von Neumann or SISD) computer systems. Evolution, design, implementation, and evaluation of state-of-the-art systems. Memory Systems, including interleaving, hierarchies, virtual memory and cache implementations; Communications and I/O, including bus architectures, arbitration, I/O processors and DMA channels; and Central Processor Architectures, including RISC and Stack machines, high-speed arithmetic, fetch/execute overlap, and parallelism in a single-processor system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 437, CSCE 837; CSCE 930; CSCE 933**CSCE 832 High-Performance Processor Architectures****Crosslisted with:** CSCE 432**Prerequisites:** CSCE 430; MATH 314; MATH/STAT 380 or ECEN 305.**Notes:** Assumes knowledge of computer architecture, pipelining, memory hierarchy, instruction level parallelism, and compiler principles.**Description:** High performance computing at the processor level. The underlying principles and micro-architectures of contemporary high-performance processors and systems. State-of-the-art architectural approaches to exploiting instruction level parallelism for performance enhancements. Case studies of actual systems highlight real-world trade-offs and theories.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 834 VLSI Design****Crosslisted with:** CSCE 434**Prerequisites:** CSCE 335.**Description:** Introduction to VLSI design using metal-oxide semiconductor (MOS) devices primarily aimed at computer science majors with little or no background in the physics or circuitry of such devices. Includes design of nMOS and CMOS logic, data-path, control unit, and highly concurrent systems as well as topics in design automation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 932**CSCE 835 Cluster and Grid Computing****Crosslisted with:** CSCE 435**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H, or RAIK 283H.**Notes:** Designed for CSCE and non-CSCE students who have an interest in building or programming clusters to enhance their computationally-intensive research.**Description:** Build and program clusters. Cluster construction, cluster administration, cluster programming, and grid computing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 836 Advanced Embedded Systems****Crosslisted with:** CSCE 436**Prerequisites:** A grade of "P" or "C" or better in CSCE 231, CSCE 236 or ECEN 220.**Description:** Embedded hardware design techniques; transceiver design and low-power communication techniques; sensors and distributed sampling techniques; embedded software design and embedded operating systems; driver development; embedded debugging techniques; hardware and software architectures of embedded systems; and design, development, and implementation of embedded applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 837 File and Storage Systems****Crosslisted with:** CSCE 437**Prerequisites:** CSCE 351 or 451/851; CSCE 430/830.**Description:** System-level and device-level topics in the design, implementation, and use of file and storage systems. Components and organization of storage systems, disk drive hardware and firmware, multi-disk systems, RAID's, local distributed and P2P file systems, and low-power design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 838 Sensor Networks**Crosslisted with:** CSCE 438**Prerequisites:** CSCE 230; SOFT 260, CSCE 310, CSCE 310H, CSCE 311 or equivalent; senior or graduate standing or instructor permission.**Description:** Basics of sensor networks; theoretical and practical insight into wireless sensor networks, including low-power hardware and wireless communication principles; networking in wireless sensor networks; and applications of sensor networks, such as multimedia, underwater, and underground. A group project that provides hands-on interaction with a wireless sensor network testbed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 839 Robotics: Algorithms and Applications****Crosslisted with:** CSCE 439**Prerequisites:** A grade of "P" or "C" or better in CSCE 231, CSCE 236 or ECEN 220 and CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H**Description:** Fundamental theory and algorithms for real world robot systems. Design and build a robot platform and implement algorithms in C++ or other high level languages. Topics include: open and closed loop control, reactive control, localization, navigation, path planning, obstacle avoidance, dynamics, kinematics, manipulation and grasping, sensing, robot vision processing, and data fusion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**CSCE 840 Numerical Analysis I****Crosslisted with:** CSCE 440, MATH 440, MATH 840**Prerequisites:** CSCE 155A, CSCE 155E, CSCE 155H, CSCE 155N, CSCE 155T, or SOFT 160; MATH 107.**Notes:** Credit toward the degree may be earned in only one of the following: CSCE/MATH 440/840 and MECH 480/880.**Description:** Principles of numerical computing and error analysis covering numerical error, root finding, systems of equations, interpolation, numerical differentiation and integration, and differential equations. Modeling real-world engineering problems on digital computers. Effects of floating point arithmetic.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**CSCE 841 Approximation of Functions****Crosslisted with:** CSCE 441, MATH 441, MATH 841**Prerequisites:** MATH 221/MATH 221H and MATH 314/MATH 314H.**Description:** Polynomial interpolation, uniform approximation, orthogonal polynomials, least-first-power approximation, polynomial and spline interpolation, approximation and interpolation by rational functions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**Groups:** Advanced Mathematics Courses**CSCE 847 Numerical Linear Algebra****Crosslisted with:** CSCE 447, MATH 447, MATH 847**Prerequisites:** MATH 314**Description:** Mathematics and algorithms for numerically stable matrix and linear algebra computations, including solution of linear systems, computation of eigenvalues and eigenvectors, singular value decomposition, and QR decomposition.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**Groups:** Advanced Mathematics Courses**CSCE 851 Operating Systems Principles****Crosslisted with:** CSCE 451**Prerequisites:** A grade of "P" or "C" or better in CSCE 230, CSCE 230H or CSCE 231 and CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Organization and structure of operating systems. Control, communication, and synchronization of concurrent processes. Processor and job scheduling. Memory organization and management including paging, segmentation, and virtual memory. Resource management. Deadlock avoidance, detection, recovery. File system concepts and structure. Protection and security. Substantial programming.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 437, CSCE 837; CSCE 455, CSCE 855**CSCE 855 Distributed Operating Systems****Crosslisted with:** CSCE 455**Prerequisites:** CSCE 451/851.**Description:** Organization and structure of distributed operating systems. Control, communication and synchronization of concurrent processes in the context of distributed systems. Processor allocation and scheduling. Deadlock avoidance, detection, recovery in distributed systems. Fault tolerance. Distributed file system concepts and structure.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 496, CHME 896**CSCE 856 Parallel Programming****Crosslisted with:** CSCE 456**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H, or RAIK 283H.**Description:** Introduction to the fundamentals of parallel computation and applied algorithm design. Methods and models of modern parallel computation; general techniques for designing efficient parallel algorithms for distributed and shared memory multiprocessor machines; principles and practice in programming an existing parallel machine.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 857 Systems Administration**Crosslisted with:** CSCE 457**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Introduction to basic concepts of system administration. Operating systems and networking overview. User and resource management. Networking, systems and internet related security. System services and common applications, web services, database services, and mail servers. Basic scripting in shell, Perl, and Expect. Systems administration on UNIX® platform.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 860 Software Engineering for Robotics****Crosslisted with:** SOFT 460, CSCE 460**Prerequisites:** SOFT 261 or RAIK 383H or CSCE 361**Description:** Application of software engineering practices and principles to autonomous robotic systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**CSCE 861 Advanced Topics in Software Engineering****Crosslisted with:** CSCE 461, SOFT 461**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Description:** Advanced or emerging techniques in software engineering. Topics include but not limited to design methodology, software dependability, and advanced software development environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 862 Communication Networks****Crosslisted with:** CSCE 462**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; STAT 380, ECEN 305 or RAIK 270H.**Description:** Introduction to the architecture of communication networks and the rudiments of performance modeling. Circuit switching, packet switching, hybrid switching, protocols, local and metro area networks, wide area networks and the Internet, elements of performance modeling, and network programming. Network security, asynchronous transfer mode (ATM), optical, wireless, cellular, and satellite networks, and their performance studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 952; CSCE 953**CSCE 863 Data and Network Security****Crosslisted with:** CSCE 463**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Concepts and principles of data and network security. Focuses on practical aspects and application of crypto systems in security protocols for networks such as the Internet. Topics include: applications of cryptography and cryptosystems for digital signatures, authentication, network security protocols for wired and wireless networks, cyberattacks and countermeasures, and security in modern computing platforms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 864 Internet Systems and Programming****Crosslisted with:** CSCE 464**Notes:** A grade of "Pass" or C or better in CSCE 156, SOFT 161, RAIK 184H or CSCE 311 or equivalent programming experience.**Description:** Paradigms, systems, and languages for Internet applications. Client-side and server-side programming, object-based and event-based distributed programming, and multi-tier applications. Coverage of specific technologies varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 865 Wireless Communication Networks****Crosslisted with:** CSCE 465**Prerequisites:** A grade of "P" or "C" or better in STAT 380, ECEN 305 or RAIK 270H**Description:** Discussion of theoretical and practical insight to wireless communications and wireless networking, current practices, and future trends. Wireless network architectures, mobility management, radio propagation, modulation, power control, antennas, channel access, pricing, and standards.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 866 Software Design and Architecture****Crosslisted with:** SOFT 466, CSCE 466**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** Introduction to the concepts, principles, and state-of-the-art methods in software design and architecture. Topics include application of software engineering process models and management approaches for the design and architecture of large-scale software systems, trade-offs of designing for qualities such as performance, security, and dependability, and techniques and tools for analyzing and evaluating software architectures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 867 Testing, Verification and Analysis**Crosslisted with:** SOFT 467, CSCE 467**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** In-depth coverage of problems related to software quality, and approaches for addressing them. Topics include testing techniques, dynamic and static program analysis techniques, and other approaches for verifying software qualities. Tool support for performing testing, verification, and analysis will also be studied.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 868 Requirements Elicitation, Modeling and Analysis****Crosslisted with:** SOFT 468, CSCE 468**Prerequisites:** A grade of "P" or "C" or better in CSCE 361, CSCE 361H, SOFT 261, SOFT 261H or RAIK 383H.**Notes:** Letter grade only.**Description:** In-depth coverage of processes, methods and techniques for determining, or deciding, what a proposed software system should do. Topics include the requirements engineering process, identification of stakeholders, requirements elicitation techniques, methods for informal and formal requirements documentation, techniques for analyzing requirements models for consistency and completeness, and traceability of requirements across system development and evolution. Tool support for modeling functional and non-functional requirements to support elicitation and analysis will be studied.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 870 Computer Graphics****Crosslisted with:** CSCE 470**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; MATH 314**Description:** Display and recording devices; incremental plotters; point, vector, and character generation; grey scale displays, digitizers and scanners, digital image storage; interactive and passive graphics; pattern recognition; data structures and graphics software; the mathematics of three dimensions; homogeneous coordinates; projections and the hidden-line problem.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 871 Introduction to Bioinformatics****Crosslisted with:** CSCE 471**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Fundamentals and trends in bioinformatics. Scoring matrices and pairwise sequence alignments via dynamic programming, BLAST, and other heuristics. Multiple sequence alignments. Applications of machine learning methods such as hidden Markov models and support vector machines to biological problems such as family modeling and phylogeny.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 971**CSCE 872 Digital Image Processing****Crosslisted with:** CSCE 472**Notes:** A grade of "Pass" or C or better in CSCE 156, SOFT 161, RAIK 184H or CSCE 311 or equivalent programming experience.**Description:** Digital imaging systems, digital image processing, and low-level computer vision. Data structures, algorithms, and system analysis and modeling. Digital image formation and presentation, image statistics and descriptions, operations and transforms, and system simulation. Applications include system design, restoration and enhancement, reconstruction and geometric manipulation, compression, and low-level analysis for computer vision.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 873 Computer Vision****Crosslisted with:** CSCE 473**Notes:** A grade of "Pass" or C or better in CSCE 156, SOFT 161, RAIK 184H or CSCE 311 or equivalent programming experience.**Description:** High-level processing for image understanding and high-level vision. Data structures, algorithms, and modeling. Low-level representation, basic pattern-recognition and image-analysis techniques, segmentation, color, texture and motion analysis, and representation of 2-D and 3-D shape. Applications for content-based image retrieval, digital libraries, and interpretation of satellite imagery.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 874 Introduction to Data Mining****Crosslisted with:** CSCE 474**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; STAT 380, ECEN 305 or RAIK 270H.**Notes:** Requires the completion of a project involving the application of data mining techniques to real-world problems.**Description:** Data mining and knowledge discovery methods and their application to real-world problems. Algorithmic and systems issues. Statistical foundations, association discovery, classification, prediction, clustering, spatial data mining and advanced techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 875 Multiagent Systems**Crosslisted with:** CSCE 475**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Distributed problem solving and planning, search algorithms for agents, distributed rational decision making, learning multiagent systems, computational organization theory, formal methods in Distributed Artificial Intelligence, multiagent negotiations, emergent behaviors (such as ants and swarms), and Robocup technologies and real-time coalition formation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 876 Introduction to Artificial Intelligence****Crosslisted with:** CSCE 476**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Introduction to basic principles, techniques, and tools now being used in the area of machine intelligence. Languages for AI programming introduced with emphasis on LISP. Lecture topics include problem solving, search, game playing, knowledge representation, expert systems, and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 974; CSCE 976**CSCE 877 Cryptography and Computer Security****Crosslisted with:** CSCE 477**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H; MATH 314.**Description:** Introductory course on cryptography and computer security. Topics: classical cryptography (substitution, Vigenere, Hill and permutation ciphers, and the one-time pad); Block ciphers and stream ciphers; The Data Encryption Standard; Public-key cryptography, including RSA and El-Gamal systems; Signature schemes, including the Digital Signature Standard; Key exchange, key management and identification protocols.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 878 Introduction to Machine Learning****Crosslisted with:** CSCE 478**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H**Notes:** STAT 380, ECEN 305, or RAIK 270H recommended.**Description:** Introduction to the fundamentals and current trends in machine learning. Possible applications for game playing, text categorization, speech recognition, automatic system control, data mining, computational biology, and robotics. Theoretical and empirical analyses of decision trees, artificial neural networks, Bayesian classifiers, genetic algorithms, instance-based classifiers and reinforcement learning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 879 Introduction to Neural Networks****Crosslisted with:** CSCE 479**Prerequisites:** A grade of "P" or "C" or better in CSCE 310, CSCE 310H, CSCE 311, SOFT 260, SOFT 260H or RAIK 283H.**Description:** Introduction to the concepts, design and application of connection-based computing begins by simulating neural networks, focusing on competing alternative network architectures, including sparse distributed memories, Hopfield networks, and the multilayered feed-forward systems. Construction and improvement of algorithms used for training of neural networks addressed to reduce training time and improve generalization. Algorithms for training and synthesizing effective networks implemented in high level language programs running on conventional computers. Emphasis on methods for synthesizing and simplifying network architectures for improved generalization. Application areas include: pattern recognition, computer vision, robotics medical diagnosis, weather and economic forecasting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 890 Special Topics in Computer Science****Crosslisted with:** CSCE 490**Prerequisites:** Permission**Notes:** Will not count toward a major or minor in Computer Science and Computer Engineering. Topics vary.**Description:** Aspects of computers and computing for non-Computer Science and Computer Engineering majors and/or minors.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**CSCE 891 Internship in Computer Practice****Description:** Experiential learning in conjunction with an approved industrial or governmental agency under the joint supervision of an outside sponsor and a faculty member. A detailed project proposal must be prepared by the student and approved by the department prior to the start of the project. A final report must be submitted.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** FLD**CSCE 896 Special Topics in Computer Science****Crosslisted with:** CSCE 496**Prerequisites:** Senior or graduate standing.**Description:** Aspects of computers and computing not covered elsewhere in the curriculum presented as the need arises.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC

CSCE 897 Masters Project**Prerequisites:** Permission of adviser**Notes:** Designed for students pursuing a non-thesis option (Option III) to work on a project under the supervision of a member of the computer science and engineering faculty.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**CSCE 898 Computer Problems****Crosslisted with:** CSCE 498**Prerequisites:** Senior or graduate standing.**Description:** Independent project executed under the guidance of a member of the faculty of the Department of Computer Science. Solution and documentation of a computer problem demanding a thorough knowledge of either the numerical or nonnumerical aspects of computer science.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**CSCE 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**CSCE 910 Information Organization and Retrieval****Prerequisites:** CSCE 810**Description:** Aspects of natural language processing on digital computers. Analysis of information content by statistical, syntactic, and logical methods. Search and matching techniques. Automatic retrieval systems, question-answering systems. Evaluation of retrieval effectiveness.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 913 Advanced Topics in Database Systems****Prerequisites:** CSCE 813**Description:** Database system topics, coverage varying from year to year. Examples: Normalization theory; statistical databases; distributed databases; failure recovery; implementation issues. Readings in the current literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 914**CSCE 914 Constraint Database Systems****Prerequisites:** CSCE 813 or 913 and permission**Description:** Introduction to constraint database systems. Constraint data model, constraint query languages, query optimization and evaluation, constraint data storage and applications. Assignments in both use and the implementation of systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 921 Advanced Constraint Processing****Prerequisites:** CSCE421/821**Description:** A continuation of the course on Foundations of Constraint Processing (CSCE 421/821). Intended for students with some sophistication and considerable interest in exploring methods for designing and using algorithms useful for solving combinatorial problems. The goal of the course is to study, analyze and critique seminal and recent research papers. Projects are optional.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 923 Development and Analysis of Efficient Algorithms****Prerequisites:** CSCE 423/823**Description:** Analysis of performance of algorithms on random access machines and Turing machines, data structures for design of efficient algorithms, sorting algorithms, divide and conquer strategies, algorithms on graphs and their performance bounds, pattern matching algorithms, achievable lower bounds on complexity, NP complete problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 924 Graph Algorithms****Prerequisites:** CSCE 423/823**Description:** Review concepts related to analysis of algorithms and graph theory. Classical graph theoretic algorithms including Eulerian paths, Hamiltonian circuits, shortest paths, network flows and traveling salesman. Planar graph algorithms. Theory of alternating chains and algorithms for graph matching problems. Approximate and parallel algorithms. Applications of graph algorithms to engineering and physical sciences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 925 Scheduling Theory****Prerequisites:** Permission**Description:** Scheduling theory with particular emphasis to its application in computer science. Polynomial-time algorithms, NP-hardness proofs and analysis of heuristics. Minimization of makespan and mean flow time. Real-Time scheduling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 930 Advanced Computer Architecture**Prerequisites:** CSCE 830**Description:** Recent advances in computer architecture including the effects of VLSI and methods of improving performance. Parallelism, pipelining, vector and array processors, multiprocessors and distributed processors, and data-flow architectures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 932 Fault-Tolerance: Testing and Testable Design****Prerequisites:** CSCE 834**Description:** Increasing density of microelectronic circuits makes them harder to test during production and field operation. Theory and techniques developed to solve this problem. Faults and fault modeling; algorithms for test generation and fault simulation; built-in-self-test methods and standards; design for testability; and self-checking circuits.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 933 Fault-Tolerance: System Design and Analysis****Prerequisites:** CSCE 830**Description:** Theory and practice of creating extremely dependable digital systems through online fault-tolerance. Emphasizes modular redundancy in hardware and software to permit detection, masking, and removal of faulty components. Case studies from aerospace, banking, and other disciplines. Fault classification, error detection and diagnosis, dependability metrics, Byzantine Agreement, design trade-offs, and system simulation and modeling (esp. Markov).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 936 Cyber-Physical Systems****Prerequisites:** Permission.**Description:** Introduction to the research, design, and analysis of cyber-physical systems - the tight integration of computing, control, and communication. Applications for CPS research are far reaching and span medical devices, smart buildings, vehicle systems, and mobile computing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 942 Numerical Analysis III****Crosslisted with:** MATH 942**Prerequisites:** CSCE/MATH 840 or 841 or 847**Description:** Advanced topics in numerical analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 952 Advanced Computer Networks****Prerequisites:** CSCE 862**Description:** Advanced-level course on the recent development in computer networks. Integrated Services Digital Networks (ISDN), Broadband-ISDN and Asynchronous Transfer Mode (ATM), Multimedia Source and Traffic Characteristics, Source Policing, Scheduling and Quality of Service, Wireless Communication, Tracking of Mobile Users, Performance Computer networks.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 953 Optical Communication Networks****Prerequisites:** CSCE 462/862 or equivalent**Description:** State-of-the-art optical communication networks, encompassing traditional networks operating on optical fiber and next-generation networks such as wavelength division multiplexed (WDM) and optical time division multiplexed (OTDM) networks. Fundamentals of optical network design, control, and management. Optical network design and modeling, routing and wavelength assignment algorithms, optical network simulation tools and techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 961 Coding Theory****Notes:** MATH 817 desirable**Description:** Channels, introduction to information theory, Shannon's fundamental theorem, Linear codes, Hamming codes, Reed-Muller codes, cyclic codes, idempotents, BCH codes, Reed-Solomon codes, Quadratic residue codes, perfect single-error correcting codes, Sphere packings, the Golay codes, Lloyds theorem, nonexistence theorems, weight enumerators, the MacWilliams equation, association schemes, quasi-symmetric designs, polarities of designs, extension of graphs, self-orthogonal codes and designs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CSCE 962 Advanced Software Engineering****Prerequisites:** CSCE 361 or CSCE 361H**Description:** Recent advances in the field of software engineering. Software reuse, artificial intelligence approaches to software design, usability and requirements engineering, and design environments. Computer tools for the design of software products. Analysis of software artifacts. Coordination in distributed software development. Readings from current software engineering literature discussed and evaluated. Students will participate in a group project which investigates specific software engineering research topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CSCE 970 Pattern Recognition

Prerequisites: CSCE 310 or 311; MATH 314/814; MATH/STAT 380 or STAT 880 or ELEC 305

Description: Introduction to statistical decision theory, adaptive classifiers, supervised and non-supervised training. Pattern recognition systems: Transducers, feature extractors, decision units. Applications to optical character recognition, speech processing, remote sensing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 971 Advanced Bioinformatics

Prerequisites: CSCE 471/871

Description: Advanced algorithmic techniques for bioinformatics. Development and analysis of string matching, graph theoretic and dynamic programming techniques applied to systems and computational biology problems such as multiple sequence alignment, alignment of DNA and protein sequences, genome rearrangements, and phylogeny and haplotypes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 973 Support Vector Machines

Prerequisites: CSCE 310 or 311; MATH 314/814; MATH/STAT 380 or STAT 880; or ELEC 305

Description: Core theory of the machine learning technique called support vector machines. Margin, kernels, and the formulation of a machine learning problem as an optimization problem that can be solved optimally. Implementation issues, kernel design, the appropriateness of various kernels for different applications, and regularization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 974 Genetic Algorithms

Prerequisites: CSCE 310 and 876

Description: Introduction of the motivation and current implementations of advanced genetic algorithms. These algorithms are built on basic principles borrowed from biology. Illustrates how a novel, implicitly-parallel search is implemented to obtain solutions for combinatorically-difficult problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 976 Advanced Artificial Intelligence

Prerequisites: CSCE 876

Notes: For students with some sophistication and considerable interest in exploring methods of designing and using algorithms useful for finding adequate answers to combinatorically large problems that require largely symbolic rather than numeric computing.

Description: Study, analyze and critique basic and current research papers and to engage in artificial intelligence projects and experiments either alone or in small groups. Artificial intelligence environments, tools and expert system building. Class participation will be encouraged for the review of the more recent AI literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 977 Data Encryption

Prerequisites: STAT 880, CSCE 235 or MATH 817

Description: History of public cryptology; elements of statistics, combinatorics, number theory, group theory; symmetric and asymmetric cryptosystems, "trap door" functions; public key cryptosystems; RSA and knapsack; levels of cryptographic security; computational complexity of algorithms; National Bureau of Standards-DES (Standard); block and stream cyphers; cypher key management; protection of proprietary software and data.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 979 Advances in Neural Networks and Genetic Algorithms

Description: The state-of-the-art methods for supervised training of neural networks followed by the implementation and application of genetic algorithms. Evolution and self-organization of complex, adaptive, nonlinear systems for solving problems of pattern recognition, cognition, and control. Obtaining insight into the internal workings of neural networks. Current theories and experimental testing used for analysis and testing of connections and thresholds of trained neural networks. Reference materials include research reports, papers, and books on the theory and design of neural network based processors and problem solving systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 990 Seminar

Prerequisites: Permission

Description: Frontiers of an area of computer science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

CSCE 991 Directed Doctoral Research

Prerequisites: Admission to the doctoral degree program and permission.

Description: Plan and execute a component(s) of a research project, such as a literature review, system development, exploratory experimentation, or proposal development, under supervision of a graduate faculty advisor, as an initial step for doctoral dissertation research. Write a formal report on the research project and its intellectual merit and potential impact. Successfully complete the doctoral program qualifying examination.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CSCE 996 Research Problems Other Than Thesis

Description: Investigation of minor research problems to introduce graduate students to the methods of research in computer science by assigning a problem which is of research interest but within the capacity of a graduate student to complete within a semester.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

CSCE 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Construction Engineering (CONE)

CONE 816 Wood and / or Contemporary Materials Design

Crosslisted with: CONE 416

Prerequisites: CIVE 341

Description: Design of structural timber, beams, columns, and connections. Introduction to applicable design philosophies and codes. Overview of materials design. Masonry, aluminum, and contemporary materials such as plastics and fiber reinforced systems and composite material groups. Design considerations, cost and constructability analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 817 Formwork Systems

Crosslisted with: CONE 417

Prerequisites: CONE 416; parallel CIVE 441.

Description: Design of structural timber, beams, columns, and connections. Introduction to applicable design philosophies and codes. Overview of materials design. masonry, aluminum, and contemporary materials such as plastics and fiber reinforced systems and composite material groups. Design considerations, cost and constructability analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 821 Construction Risk Assessment and Management

Prerequisites: STAT 380

Description: The overall process of hazards risk management (risk identification, risk analysis, risk assessment, risk communication), risk based decision making and risk mitigation. Classification of building stock, defining vulnerability, risk assessment methods, assessing economic losses and cost benefit analysis. Case studies will be used to demonstrate the application of risk management principles/techniques in practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 850 Sustainable Construction

Crosslisted with: CONE 450

Prerequisites: Senior standing.

Description: Sustainable construction and its application to the green building industry. LEED certification process, sustainable building site management, efficient waste water applications, optimizing energy performance, indoor environmental issues, performance measurement and/or verification, recycled content and certified renewable materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 859 BIM I: Introduction to Building Information Modeling (BIM)

Crosslisted with: CONE 459

Prerequisites: CNST 112 Construction, or Graduate standing in AREN, CIVE, CNST, or CONE.

Description: This course instructs CAD users on the effective use of Building Information Model (BIM) for Integration of design, document and Construction Estimate. Topics include: model-based 3D design, file formats, interoperability, and MEP modeling.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 866 Heavy and/or Civil Estimating

Crosslisted with: CONE 466

Prerequisites: CONE 319, CONE 378, and CONE 485.

Description: Estimating techniques and strategies for heavy and/or civil construction. Unit pricing, head and civil constructions takeoffs and estimating, equipment analysis, overhead cost and allocations, estimating software and government contracts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 881 Highway and Bridge Construction

Crosslisted with: CONE 481

Prerequisites: Senior standing; CONE/CNST 241.

Description: The methods and equipment required in the construction of roads and bridges. Methods and equipment necessary for roads and bridges. Substructure and superstructures, precast and cast-in-place segments, and standard and specialized equipment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CONE 882 Heavy and/or Civil Construction**Crosslisted with:** CNST 482, CNST 882, CONE 482**Prerequisites:** Senior or Graduate standing in ARCH, AREN, CIVE, CNST, or CONE.**Description:** Application of management principles to the construction of heavy and/or civil projects. History, theory, and methods of planning and constructing heavy and/or civil projects. Emerging equipment and new equipment capabilities. Economical use of equipment and managing costs associated with production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CONE 883 Support of Excavation****Crosslisted with:** CONE 483**Prerequisites:** Senior standing.**Description:** The design and placement of excavation supports according to OSHA requirements and industry standards. A variety of routine to moderately complex support systems. Open excavations, sheet piling and cofferdams, soil mechanics, lateral loads, hydrology, and pumping methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CONE 885 Construction Planning, Scheduling, and Controls****Crosslisted with:** CNST 485, CONE 485, CNST 885**Prerequisites:** CNST 378; CNST 2250 (UNO).**Description:** Planning and scheduling a construction project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, network construction, time estimates, critical path, float time, crash programs, scheduling, and monitoring project activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CNST 489**CONE 891 Special Topics in Construction Engineering****Prerequisites:** Master of engineering in construction or related discipline and permission**Notes:** Topic varies. A signed student-instructor learning contract is required.**Description:** Individual or small group investigation of special topics in construction engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CONE 895 Graduate Internship****Crosslisted with:** CNST 895**Prerequisites:** Open only to Construction Management graduate students.**Description:** Participation in a full-time summer internship with an approved Construction Engineering or Construction Management related entity. Includes weekly assignments and a final presentation that are designed to create interaction between the Construction entity and the intern, and associated with the business aspects of the entity. General topics include Business Plans, Marketing, Finance and Budgets, Contracts, Legal Issues and Professionalism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Offered:** SUMMER**CONE 898 Special Topics in Construction Engineering****Prerequisites:** Master of engineering in construction or related discipline and permission**Description:** A signed student-instructor learning contract is required. Individual or small group investigation of special topics in construction engineering. Topic varies.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**CONE 981 Precast Concrete Construction****Prerequisites:** CIVE 440 and CIVE 441**Description:** Introduces building and bridge construction using precast concrete components including design, production, and erection challenges with emphasis on precast connection details.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CONE 993 Graduate Seminar****Crosslisted with:** CNST 993**Prerequisites:** Graduate student in Construction Program**Notes:** All MS and PhD graduate students in Construction Engineering and Management (CEMT) must enroll in their first semester of matriculation. P/NP only for 1 hour credit maximum. Attendance of a minimum of 15 Durham School Graduate Student Seminars, CEMT project presentations, and/or MS/PhD thesis presentations in the College of Engineering is required. Presentation of one seminar within the Durham School Graduate Student Seminar series, prior to the final graduate degree oral examination, is also required.**Description:** Seminar participation to broaden knowledge of construction engineering and management topics, improve presentation and professional skills, and learn about professional development resources available on campus.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

CONE 999 Doctoral Dissertation

Prerequisites: Admission to the Doctor of Philosophy in Engineering degree program and permission of the major advisor

Credit Hours: 1-21

Min credits per semester: 1

Max credits per semester: 21

Max credits per degree: 21

Format: IND

Construction Management (CNST)

CNST 811 Project Administration

Crosslisted with: CNST 411

Prerequisites: CIVE 378 or CNST 379

Description: An introduction to construction project administration. Ownership and organization of construction companies, construction documentation and specifications, type of contracts, take-offs, estimating, bidding, bonds, insurance, project management and administration, scheduling, time and cost management, labor law and labor relations, and project safety.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 815 Mechanical/Electrical Project Management

Crosslisted with: CNST 415

Prerequisites: CNST 305, CNST 306, CNST 379.

Notes: CNST 405 and CNST 406 are recommended.

Description: Fundamentals of project management within the mechanical and electrical contracting industry. Codes, contract documents, productivity, coordination, project control and administration, scheduling, safety, and project closeout, from a specialty contracting perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 820 Professional Practice and Ethics

Crosslisted with: CNST 420

Prerequisites: CNST 379 and BLAW 300 or BLAW 372.

Notes: This course is a prerequisite for or must be taken parallel with CNST 489.

Description: Orientation to professional practice through the designers' and the contractors' relationships to society, specific clients, their professions, and other collaborators in environmental design and construction fields. Ethics, professional communication and responsibility, professional organization, office management, construction management, professional registration, and owner-designer-contractor relationships.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 825 Alternative Project Delivery Methods

Crosslisted with: CNST 425

Prerequisites: Senior or graduate standing

Description: Historical and current project delivery methods (PDM) are explored. Procurement strategies, contractual arrangements, and compensation methods are also discussed in conjunction with risks, costs, and legal and ethical issues that need to be considered when determining which system is best for a particular project.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

CNST 826 Occupational Health and Safety for Construction

Prerequisites: Permission

Description: Investigation of occupational health and safety hazards in the construction environment. Accident causation and illness exposure models, construction safety and health programs and contract requirements, project safety and health management, special problems in construction safety, OSHA/EPD/ADA regulation and compliance issues, health assessment and monitoring, safe building methods design, toxic substance exposures, abatement methods, and worker training and protection.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 834 The Design/Build Project Delivery System

Crosslisted with: CNST 434

Prerequisites: CNST 379.

Description: The organizational, managerial, ethical and legal principles involved in design/build as a construction project delivery system. Advantages and disadvantages, growth, merits, and criticism of the design-build system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 835 Design/Build: Methods and Application

Prerequisites: Permission

Description: Investigation, documentation, and application of current Design/Build processes and methodology used in commercial construction. Principles and practices of Design/Build as a project delivery system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 836 Intent and Application of International Building Code

Crosslisted with: CNST 436

Prerequisites: CNST 112 and CNST 251.

Description: This course is designed to provide a fundamental understanding of how to research, interpret and apply building code requirements to the design and construction of both new and renovated structures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 844 Construction Site Safety Management**Crosslisted with:** CNST 444**Prerequisites:** CNST 242

Notes: Satisfactory completion will partially qualify the individual to be designated by their employer as a construction site "competent person" by successfully completing the OSHA 30-hour Construction Safety Card as well as additional certifications in basic first aid, CPR, and AED.

Description: Provides introductory construction site safety management for project engineers, project managers, safety teams, and company safety officers. Addresses basic accident and injury models, human accident costs, safety behavior, ethical issues in safety, workers' compensation and EMR, job safety analysis (JSA), project site safety audits, safety promotion and training, emergency planning and response, safety management programs and training, and OSHA record-keeping and reporting.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**CNST 850 Sustainable Construction****Prerequisites:** Graduate standing in ARCH, CET, CIVE, or CNST

Description: Application of Leadership in Energy and Environmental Design (LEED) best practices in building procurement and delivery systems. History, theory, and state-of-the-art practices in designing and constructing green buildings. Basic principles required to make the multitude of decisions when designing or constructing a green building. LEED construction practices (emerging practices that are economical, produce esthetically pleasing structures, and are environmentally sound).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 858 Construction Information Management Systems****Prerequisites:** Graduate standing in construction management or related discipline with instructor approval

Description: Fundamental knowledge of construction information management systems. Construction project management software will be used including database design.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 860 Construction Visualization and Simulation****Prerequisites:** Graduate standing in construction management or related discipline with instructor approval

Description: Fundamental knowledge of visualization platforms of buildings and construction. Topics include construction visualization software, basic data structure and programming, interoperability, and building performance simulation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 879 Construction Management and Construction Systems****Prerequisites:** Permission

Description: Quantity survey methods, production rate and cost analysis, bidding, contingency and risk analysis. Computer applications of estimating and research topics. Monte Carlo simulation, Virtual 3D, BIM applications relevant to construction estimating and risk analysis.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 880 Productivity and Human Factors in Construction****Crosslisted with:** CNST 480**Prerequisites:** Senior standing, CNST 378, and MNGT 300.

Notes: This course is a prerequisite for or must be taken parallel with CNST 489.

Description: Motivation and productivity improvement methods in the management of construction workers in their typical job environments. Methods to improve working environments in the field and in the office. Procedures and mechanisms to implement human behavior and ergonomics concepts for enhanced productivity and safety.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CNST 489**CNST 882 Heavy and/or Civil Construction****Crosslisted with:** CNST 482, CONE 482, CONE 882**Prerequisites:** Senior or Graduate standing in ARCH, AREN, CIVE, CNST, or CONE.

Description: Application of management principles to the construction of heavy and/or civil projects. History, theory, and methods of planning and constructing heavy and/or civil projects. Emerging equipment and new equipment capabilities. Economical use of equipment and managing costs associated with production.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 883 Management of Limited Scope Permitting****Prerequisites:** Graduate standing in ARCH, CET, CIVE, or CNST

Description: Building code permitting process associated with all projects. Phased projects that require one or more limited scope permits prior to receiving the final full construction permit. How to improve coordination and reduce the confusion and risk associated with managing the permitting process. The permitting process that is applicable to both large and small projects and that can be easily adapted and used in all jurisdictions throughout the United States.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

CNST 885 Construction Planning, Scheduling, and Controls**Crosslisted with:** CNST 485, CONE 485, CONE 885**Prerequisites:** CNST 378; CNST 2250 (UNO).**Description:** Planning and scheduling a construction project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, network construction, time estimates, critical path, float time, crash programs, scheduling, and monitoring project activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CNST 489**CNST 886 Construction Management Systems****Crosslisted with:** CNST 486**Prerequisites:** CNST 379**Description:** Application of selected topics in systems analysis (operations research) to construction management. Simulation, mathematical optimization, queuing theory, Markov decision processes, econometric modeling, neural networks, data envelopment analysis, decision analysis and analytic hierarchy processes as used in the construction industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 887 Construction Leadership and Strategic Planning****Prerequisites:** Permission**Description:** New models of construction leadership for the 21st Century. Application of transformational leadership to strategic planning and marketing in construction contracting. Leadership and strategic problem solving constructs and methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 888 Residential Construction and Real Estate****Crosslisted with:** CNST 488**Prerequisites:** CNST 379**Description:** Application of various strategies to real estate development including community and residential design, planning, site selection, land development, marketing and customer service. Methods used by construction companies to analyze, bid, and market their developments to customers through the pre-construction and bidding process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 890 Masters Project****Prerequisites:** Admission to the master of engineering degree program with an emphasis in construction, and permission**Description:** Technical report, technical paper, or portfolio project, culminating in a final document and oral presentation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CNST 893 Internship Workshop****Crosslisted with:** CNST 493, CONE 493**Prerequisites:** Permission of instructor, Letter of application, Letter of agreement from industry mentor**Notes:** Permission of instructor, Letter of application, Letter of agreement from industry mentor**Description:** Participation in a full-time summer internship associated with a Construction related entity. Includes weekly assignments and a final presentation designed to foster interactions associated with the business side of the entity between the Construction entity and the intern. General topics include Time Management and Scheduling Work, Business Plans and Structures, Finance and Budgets, Marketing Plans, Contracts, Risk Analysis and Management, Personnel Management, Communication and Leadership.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LAB**Offered:** SUMMER**CNST 895 Graduate Internship****Crosslisted with:** CONE 895**Prerequisites:** Open only to Construction Management graduate students.**Description:** Participation in a full-time summer internship with an approved Construction Engineering or Construction Management related entity. Includes weekly assignments and a final presentation that are designed to create interaction between the Construction entity and the intern, and associated with the business aspects of the entity. General topics include Business Plans, Marketing, Finance and Budgets, Contracts, Legal Issues and Professionalism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Offered:** SUMMER**CNST 898 Special Topics in Construction Management****Crosslisted with:** CNST 498**Prerequisites:** Masters of engineering in construction or related discipline.**Notes:** A signed student-instructor learning contract is required.**Description:** Individual or small group investigation of topics in construction management.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**CNST 899 Masters Thesis****Prerequisites:** Admission to masters degree program**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND

CNST 936 Advanced Topics in Intent and Application of the International Building Code

Prerequisites: Graduate standing in Construction Management or by instructor permission

Description: In-depth analysis of research methodology, interpretation and application of building code requirements associated with design and construction of both new and renovated structures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 991 Thesis and Dissertation Methods for Construction Research

Prerequisites: Graduate standing in AREN, CET, CIVE, CNST, or CONE

Description: A structured approach to thesis and dissertation methods, conducting a literature review, choosing appropriate analytical methods, and writing and presenting a construction research project. Seminar course.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CNST 993 Graduate Seminar

Crosslisted with: CONE 993

Prerequisites: Graduate student in Construction Program

Notes: All MS and PhD graduate students in Construction Engineering and Management (CEMT) must enroll in their first semester of matriculation. P/NP only for 1 hour credit maximum. Attendance of a minimum of 15 Durham School Graduate Student Seminars, CEMT project presentations, and/or MS/PhD thesis presentations in the College of Engineering is required. Presentation of one seminar within the Durham School Graduate Student Seminar series, prior to the final graduate degree oral examination, is also required.

Description: Seminar participation to broaden knowledge of construction engineering and management topics, improve presentation and professional skills, and learn about professional development resources available on campus.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

CNST 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Criminology and Criminal Justice (CRIM)

CRIM 801D Nature of Crime

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 802 Administration of Justice

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 803 Research Theory & Methodology

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 804 Seminar Police & Soc

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 805 Corrections Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 808 Juvenile Justice Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 818 Criminal Justice Internship

Prerequisites: Admission to graduate program in Criminology and Criminal Justice, successful completion of 15 hours of graduate work, and permission of instructor

Notes: CRIM 818 is not open to nondegree students.

Description: Designed to provide supervised individualized learning experiences in a selected criminal justice agency. The principal objective of the internship is to provide students with the opportunity to apply theoretical and methodological principles acquired in graduate courses to the analysis of problems in local criminal justice agencies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: IND

CRIM 819 Independent Study

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: IND

CRIM 831 Correctional Law

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

CRIM 835 Community-Based Corrections**Crosslisted with:** CRIM 435**Description:** For advanced students with a special interest in the correctional process as applied in a community setting. Innovative community-based strategies for dealing with the offender as well as on the processes of probation and parole.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRIM 851 Violence****Crosslisted with:** CRIM 451**Prerequisites:** Upper Division CRCJ major; CRCJ minor; or CRIM 101 and junior/senior standing.**Description:** This course is a survey of the nature and extent of violence. The focus is on patterns of violence across social groups, the causes and correlates of violence and violent behavior, and programs/policies geared toward violence prevention and reduction. Also of interest is the relationship between theory and violence research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**CRIM 880 Special Problems in Criminal Justice****Crosslisted with:** CRIM 480**Description:** Analysis of contemporary special problems in the broad spectrum of criminal justice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 18**Format:** LEC**CRIM 899V Masters Thesis****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 99**Format:** IND

Economics (ECON)

ECON 803 Money and the Financial System**Crosslisted with:** ECON 403**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**Description:** Basic policy implications of monetary economics with special reference to the role of money in the determination of income, employment, and prices. Includes demand for and supply of money, commercial and central banking system, monetary policy-making, nonbank financial system, and other issues in monetary economics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Monetary Economics**ECON 804 Current Issues in Monetary Economics****Crosslisted with:** ECON 404**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**Description:** Money as developed by classical and modern economists. Emphasis on origins of money, interest rates, inflation, unemployment, business cycles, rational expectations, fiscal policy, international aspects of monetary policy, and other related topics in monetary economics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Monetary Economics**ECON 809 Applied Public Policy Analysis****Crosslisted with:** ECON 409**Prerequisites:** ECON 210, or both ECON 211 and ECON 212; ECON 215 or equivalent.**Description:** Experience with research methods in economics. Statistical analysis to investigate economic issues and related policies; find relevant data; perform and interpret univariate and multivariate statistical analyses; and formulate and test specific hypotheses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Quantitative Economics**ECON 813 Social Insurance****Crosslisted with:** FINA 413, ECON 413, FINA 813**Description:** Nature and causes of economic insecurity. Analysis of public programs such as Social Security, unemployment insurance, workers' compensation, and public assistance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** General Economics and Theory**ECON 814 Insurance Law****Description:** Focuses on the features of common insurance contracts, legislative and administrative restrictions on insurance contracts and judicial techniques for interpreting, construing and regulating insurance contracts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 815 Analytical Methods in Economics and Business****Crosslisted with:** AECN 815**Prerequisites:** MATH 104 or 106**Description:** Equilibrium Analysis: Applications in business, finance, and economics. Market equilibria, accumulations, and economics.

Optimization: profit, cost, and utility functions. Constrained optimization problems with utility functions. Constrained optimization problems in production and consumer allocations; Kuhn and Tucker conditions; static and dynamic input-output Models.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** ECON 917

ECON 816 Statistics for Decision Making**Crosslisted with:** ECON 416**Prerequisites:** ECON 215.**Description:** Decision making under conditions of uncertainty. Introduction to Bayesian methods including the main methods of traditional statistics. Both prior knowledge and consequences of decision error are explicitly taken into account in the analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Quantitative Economics**ECON 817 Introductory Econometrics****Crosslisted with:** ECON 417**Prerequisites:** ECON 210, or both ECON 211 and ECON 212; ECON 215 or equivalent.**Description:** Designed to give undergraduate and master's level economics students an introduction to basic econometric methods including economic model estimation and analyses of economic data. Hypothesis formulation and testing, economic prediction and problems in analyzing economic cross-section and time series data are considered.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Econometrics**ECON 819 Topics in Applied Research****Crosslisted with:** ECON 419**Prerequisites:** ECON 311 and ECON 417.**Description:** Selected topics involving the use of quantitative methods in applied research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Quantitative Economics**ECON 821 International Trade****Crosslisted with:** ECON 421**Prerequisites:** ECON 210, or both ECON 211 and ECON 212; ECON 312.**Description:** Determinants of the volume, prices, and commodity composition of trade. Effects of trade, international resource movements, trade restrictions on resource allocation, income distribution, and social welfare.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AECN 901D**Groups:** International Trade & Finance**ECON 822 International Finance****Crosslisted with:** ECON 422**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**Description:** Determinants of exchange rates, international payments, inflation, unemployment, national income, and interest rates in an open economy. International monetary system and capital and financial markets, and of the mechanisms by which a national economy and the rest of the world adjust to external disturbances.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** International Trade & Finance**ECON 823 Economics of the Less Developed Countries****Crosslisted with:** ECON 423**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**Description:** Advanced survey of development problems and goals; roles of land, labor, capital, entrepreneurship, and technical progress in economic growth of the less developed countries. Theories and strategies relating to international trade and economic development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Comp Intrntnl & Reg Develpmnt**ECON 826 Government Intervention in Markets****Crosslisted with:** ECON 426**Prerequisites:** ECON 212.**Description:** Traces the economic and legal incentives for government involvement in the marketplace. Examines why various forms of intervention make sense in certain situations. Defining the limits of allowable competition, and to replacing free market forces with regulation. Includes analysis of utilities and their evolving regulation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Industrial Organization&Reg**ECON 827 Land Use Planning****Description:** Legal and administrative aspects of the regulation of land use and development, the problems and techniques of urban planning at the various levels of government, and the relationship of private owners and builders to the government policies involved in shaping the physical environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 828 Antitrust and Trade Regulation****Description:** Control of business activities through the federal antitrust laws. Emphasis on monopolies, joint ventures, pricefixing, boycotts, resale price maintenance, exclusive dealing and tying arrangements, territorial restrictions, and mergers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ECON 829 Unfair Competition

Description: Study of the federal and state statutes and common law doctrines restricting unfair methods of competition in business. Topics include false advertising, trademark law, misappropriation, trade secret law and the right of publicity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 830 Products Liability Seminar

Description: Selected problems in products liability, with emphasis on research and writing projects analyzing the problems.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ECON 833 History of Economic Thought

Crosslisted with: ECON 433

Description: Development and evolution of economic ideas, including diverse mainstream and dissenting schools of thought from ancient Greece to contemporary texts. Consideration of selected influential economists' writings, relation between economic conditions and ideas and the antecedents of current economic controversies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: General Economics and Theory

ECON 835 Market Competition

Crosslisted with: ECON 435

Prerequisites: ECON 212.

Description: Examination of differing schools of thought about how well a market economy performs. Includes economic analysis and extensive reviews of rivalry among corporations in various sectors of the US economy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Industrial Organization&Reg

ECON 840 Regional Development

Crosslisted with: ECON 440

Prerequisites: ECON 210, or both ECON 211 and ECON 212.

Description: Advanced analysis of regional growth and development. Emphasis on the relationship between national and regional growth as well as local attributes influencing development patterns. Comparisons between developed and developing countries used to highlight similarities and differences in development patterns and policies. Empirical applicability of regional economic models stressed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ECON 442, ECON 842

Groups: Comp Intrntnl & Reg Developmnt

ECON 842 Regional Analysis

Crosslisted with: ECON 442

Prerequisites: ECON 440/840.

Description: Advanced study of techniques for regional analysis. Includes indexes of spatial dispersion and concentration, shift-share analysis, export base, and input-output analysis. Special emphasis on input-output analysis. Objective is to equip students with the basic analytical tools of regional economic analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Comp Intrntnl & Reg Developmnt

ECON 845 Gender Economics and Social Provisioning

Crosslisted with: ECON 445, WMNS 445, WMNS 845

Prerequisites: ECON 211 or ECON 212.

Description: Introduction to the field of feminist economics. Critiques of economic theory and methodology along with gender and household decision-making, the care economy, international migration, development, globalization, the feminization of labor markets, and macroeconomics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: General Economics and Theory

ECON 850 Economics for Teachers

Crosslisted with: ECON 450

Description: Structure and function of the economic system and problems in achieving goals of efficient allocation of resources, full employment, stable prices, economic growth, and security. Emphasis on teaching of economics at the pre-college level.

Credit Hours: 2-6

Min credits per semester: 2

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Groups: Economic Education

ECON 851 Economics Issues for Teachers

Crosslisted with: ECON 451

Description: Application of economic principles to current problems. Includes evaluation of economic education materials, scope and sequence for development of economic concepts in the primary and secondary school.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Groups: Economic Education

ECON 852 Teaching College Economics and Business

Description: Organization and planning, instructional strategies, assessment methods, and related topics for teaching economics and business courses in colleges and universities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 853 Economics of Education

Description: Survey of methods, theories, and analyses of education from an economics perspective. Education and human capital, educational production and cost functions, cost-benefit analysis, supply and demand for educators, education and economic growth. Survey of methods, theories, and analyses of education from an economics perspective. Education and human capital, educational production and cost functions, cost-benefit analysis, supply and demand for educators, education and economic growth.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 854 Economic Education Research

Description: Survey of research studies in the field of economic education. Research questions, data sources, theoretical models, experimental designs, statistical procedures, and research findings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 857 19th Century United States Economic History

Crosslisted with: ECON 457, HIST 857, HIST 457

Prerequisites: ECON 211 and ECON 212, or ECON 210.

Description: Transformation of the United States economy from an agrarian to an industrial society and the impact of that transformation on people's livelihoods. The economic of slavery, the impact of the railroads, immigration, and the collective response of business and labor to industrialization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: United States or Canadian Hist

ECON 858 20th Century United States Economic History

Crosslisted with: ECON 458, HIST 458, HIST 858

Prerequisites: ECON 211 and ECON 212, or ECON 210.

Description: Transformation of the United States economy in the twentieth century. Attention to the continued consolidation of the business enterprise, business cycle episodes including the Great Depression of the 1930's, organized labor, and the role of government in managing and coping with this transformation in economic life.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: United States or Canadian Hist

ECON 866 Pro-seminar in International Relations I

Crosslisted with: ECON 466, POLS 466, POLS 866, AECN 467, ANTH 479, ANTH 879, GEOG 448, GEOG 848, HIST 479, HIST 879, SOCI 466, SOCI 866

Prerequisites: Senior standing and permission.

Description: Topic varies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations&Compar Variable group based on topic

ECON 867 Pro-seminar in International Relations II

Crosslisted with: ECON 467, POLS 467, POLS 867

Prerequisites: Senior standing and permission.

Notes: Open to students with an interest in international relations. Topics vary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: International Relations&Compar

ECON 871 Public Finance

Crosslisted with: ECON 471

Prerequisites: ECON 210, or both ECON 211 and ECON 212.

Description: Microeconomic analysis of policy issues in public finance, emphasizing taxation. Includes public goods and externalities; analysis of tax incidence, efficiency, and equity; and fiscal federalism.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Public Finance

ECON 872 Efficiency in Government

Crosslisted with: ECON 472

Prerequisites: ECON 210, or both ECON 211 and ECON 212.

Description: Prepares students to conduct social and economic planning, program evaluation, and budgeting. Analysis of the delivery of government goods and services consistent with values and societal goals. Includes: philosophy of government, budget theory, social indicators, social fabric matrix, cost effective analysis, technology assessment, evaluation of the natural environment, and time analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Public Finance

ECON 873 Microeconomic Models and Applications

Crosslisted with: AECN 873

Prerequisites: ECON 211, 212, and 215

Description: This course is intended for MA Option II students and others who do not plan to proceed to PhD studies. Analysis of microeconomic decision-making by individuals and firms with emphasis on consumer demand, production, cost and profit, market structure and the economics of games, uncertainty, and information.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 874 Macroeconomic Models and Applications

Prerequisites: ECON 211, 212, and 215

Description: Course prepares student for applied macroeconomic analysis in a business, governmental or academic setting. Empirical modeling strategies are developed from theoretical underpinnings to implementation, including data collection, estimation, forecasting, simulation, presentation and interpretation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 875 Theory and Analysis of Institutional Economics**Crosslisted with:** ECON 475**Description:** Survey of the basic ideas of Veblen, Polanyi, Commons, Ayres, Galbraith, and Myrdal. Applications of institutional analysis to major economic problems and policies. Examination of the economic system as part of the holistic human culture, a complex of many evolving institutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Institutional Economics**ECON 880 Labor Law****Description:** Legislative and judicial patterns of the modern labor movement; the objectives of labor combinations; the forms of pressure employed for their realization and prevention; strikes, boycotts, picketing, and lockouts; the legal devices utilized in carving out the permissible bounds of damage suits involving labor activity; the labor injunction; the National Labor Relations Board; the nature of collective bargaining agreements; extra legal procedure for settling labor disputes-the techniques of mediation, conciliation, and arbitration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 881 Economics of the Labor Market****Crosslisted with:** ECON 481**Prerequisites:** ECON 211, ECON 212 and ECON 215.**Description:** Microeconomics of wages and employment; determinants of labor demand and supply; marginal productivity; bargaining theories of wages; labor mobility and allocation among employers; and the impact of unions, government policy, investment in human capital; and discrimination in labor markets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Labor Economics**ECON 882 Labor in the National Economy****Crosslisted with:** ECON 482**Prerequisites:** ECON 211, ECON 212 and ECON 215.**Description:** Macroeconomics aspects of labor economics; how the labor sector of the economy and the economy's overall performance are interrelated; analysis of the general level of wages, employment, unemployment, business cycles, and inflation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Labor Economics**ECON 885 The Regulatory Environment for Employment and Labor****Crosslisted with:** ECON 485, MNGT 466, MNGT 866**Prerequisites:** Junior Standing; MNGT 360 and 361 (departmental permission is required if MNGT 360 and/or MNGT 361 have not been completed).**Description:** Government regulation of employment and labor relations. Includes laws and agencies relating to employment practices, pay, hours, equal employment opportunity, labor relations, safety, health, pensions, and benefits. Social and economic implications of governmental regulation considered.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Labor Economics**ECON 886 Administrative Law****Description:** Origin and growth of the administrative process, the development of administrative law and its impact upon traditional legal institutions, analysis of the types of federal and state administrative tribunals, their powers and functions, and problems of administrative procedure, judicial and other controls upon the administrative process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 887 Economies in Transition****Crosslisted with:** ECON 487**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**Description:** Evolution of formally centrally planned economies (Soviet Union, central and eastern Europe, China) toward more market-oriented and decentralized economies. Includes comparisons of the speed and pattern of institutional changes, performance outcomes and implications for economic development strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Comp Intrntnl & Reg Develpmnt**ECON 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ECON 900 Seminar in Economic Theory and Policy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**ECON 903 Seminar in Monetary Economics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ECON 911A Advanced Macroeconomic Theory I

Description: Advanced topics in aggregate dynamics and growth.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AECN 901A; AECN 901E

ECON 911B Advanced Macroeconomic Theory II

Description: Advanced topics in macroeconomic fluctuations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 912A Advanced Microeconomic Theory I

Prerequisites: ECON 312 or equivalent

Description: Survey of the theory of individual choice; demand, supply, production, price formation. Theory of market structure.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AECN 901A; AECN 901E; ECON 912B

ECON 912B Advanced Microeconomic Theory II

Prerequisites: ECON 912A

Description: Survey of general equilibrium and welfare theory; proof of the existence and stability of equilibrium allocations, their welfare interpretation, welfare functions, externalities, the possibility theorem, the theory of clubs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ECON 912C

ECON 912C Advanced Microeconomic Theory III

Prerequisites: ECON 912B

Description: Survey of various economic tools used to study models explicitly involving strategic behavior, information transmission, and contracting in economics, finance, accounting, and other business disciplines.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: General Economics and Theory

ECON 917 Econometrics I

Prerequisites: ECON 815 or equivalent; STAT 880 or equivalent

Description: Matrix-based approach to the construction of statistical economic models, estimation of model parameters, and econometric inference. Multiple hypothesis tests, prediction, and general error structures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ECON 918

ECON 918 Econometrics II

Prerequisites: ECON 917

Description: Continuation of Econometrics I involving a more advanced treatment of statistical economics models. Identification problem and alternative methods of estimating parameters.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ECON 919; ECON 920

ECON 919 Advanced Topics in Econometrics III

Prerequisites: ECON 918 with a grade of "B" or better

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 920 Advanced Topics in Econometrics

Prerequisites: ECON 918 with a grade of "B" or better

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 921 Seminar in International Trade and Finance

Crosslisted with: AECN 921

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 923 Seminar in Development Economics

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 927 Seminar in Industrial Organization

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 954 Seminar in Economic Education Research

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 971 Public Expenditure, Taxation, and Fiscal Incidence

Prerequisites: ECON 871 or permission

Description: Administration and organization of the public sector, bureaucracy, and microeconomic theories of taxation. Public goods, externalities, uncertainty, and income redistribution as sources of market failure; private market and collective choice models as possible correcting mechanisms.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECON 972 Fiscal Theory and Its Applications**Prerequisites:** ECON 971**Description:** Advanced theory of the influence of fiscal instruments upon stability, growth, employment, balance of payments, and portfolios. Constraints of money and debt management. Generation and control of inflation. Policy applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 975 Seminar in Economic and Business History****Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 977 Seminar in Public Finance****Prerequisites:** ECON 971 and 972**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 981 Seminar in Labor Economics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECON 996 Directed Reading or Research****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**ECON 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Education (EDUC)

EDUC 892 Special Topics in Education**Crosslisted with:** EDAD 892, EDPS 892, SPED 892, TEAC 892, CYAF 892**Prerequisites:** EDPS 859 or parallel; EDPS 859 or equivalent**Description:** Aspects of education not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Education and Human Sciences (CEHS)

CEHS 894 International Experience in Communities, Schools, and Families**Crosslisted with:** CEHS 494**Description:** Instructor-guided experiences of a culture in another nation in order to critically examine individual and cross-cultural differences in values, lifestyles, education, history and culture of international families, schools, and communities. Lecture and discussion will be required as part of the field experience. Field hours will be assigned at the rate of two hours per week per student credit hour.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD

Educational Administration (EDAD)

EDAD 800 Foundations of Research and Methods of Inquiry in Educational Administration**Description:** A written report is required. Investigation and analysis of current problems in education administration and supervision.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 983**EDAD 801 Cross-Cultural Leadership Studies****Prerequisites:** Permission**Description:** For those interested in exploring leadership and leadership issues from a cross-cultural perspective. Students construct their understanding of different cultural perspectives on leadership through readings, interviews, and field trips. Provides students with a valuable perspective on their own and other cultural perspectives through the comparison of cultural viewpoints. Native American understanding of leadership.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 811 Principal Practicum****Prerequisites:** Permission**Description:** May be repeated for credit. Rating and supervision of teachers; principles and procedures in the development of school policies; selection and promotion of teachers; courses of study and professional ethics.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 8**Format:** LEC

EDAD 811B Special Education Supervisor Practicum**Prerequisites:** Instructor Permission**Notes:** The practicum experience is designed to be the capstone experience of the course of study for the M.Ed. or Administrative Certification program at the University of Nebraska-Lincoln (UNL). Candidates should complete the practicum prior to or concurrently with the last course in their prescribed course of study.**Description:** Field-based experiences in public or private accredited school(s) providing services for special needs students.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** FLD**Offered:** FALL/SPR**EDAD 813 Administration in Physical Education and Athletics****Description:** Organization and administration of physical education and athletic programs in colleges and school systems. Practices and policies as they relate to various situations and problems and in the theoretical base for these practices and policies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 814 Risk Management for Sport Facilities****Description:** Legal and risk management aspects of construction, supervision, and management of sport, athletic, and recreation indoor and outdoor facilities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 821 Foundations of Human Resource Development****Crosslisted with:** EDAD 421**Description:** Lays the foundation for further study of Human Resource Development (HRD) by examining the knowledge of HRD professionals, the roles they play, and the organizational settings in which HRD occurs. The design and development of education and training programs, how change occurs in organizations, how career development can optimize the match between individual and organizational goals and needs, and how to improve performance in organizations by analyzing performance opportunities and designing employee training to address these opportunities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 909**EDAD 822 Instructional Design in Human Resource Development****Crosslisted with:** EDAD 422**Description:** Examines the role of instruction for enhancing human learning and performance in organizations. The analysis of performance problems/opportunities and design of interventions for learning and performance improvement. The essential components of instruction, selecting instructional methods and media to achieve program objectives, the transfer of learning, and evaluating the effectiveness of instruction. The performance enhancing potential of systematically linking needs analysis, instructional design, and program evaluation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 909**EDAD 825 Work-Based Learning/Coordinating Techniques****Crosslisted with:** TEAC 425, TEAC 825**Description:** Foundation and scope of current and projected vocational cooperative education programs and general education work experience. Coordination techniques, selection and placement, instructional procedures, youth leadership activities, organization and administration, and evaluation of cooperative occupational education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 830 Administrative Theory in Educational Organizations****Description:** Introduction to classic and contemporary administrative theory as applied to educational organizations. The theoretical nature of the course content is relevant to those with an interest in a broad variety of educational institutions. General organizational theory, organizational models, historical schools of administrative theory, authority, power, motivation, and leadership. Frequently students are involved in studying problems of practice as a means of testing theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 832 Higher Education in America****Crosslisted with:** TEAC 432, TEAC 832**Description:** History and development of America's colleges and universities and a study of some recent trends and problems in higher education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 833 Educational Finance****Description:** Critical analysis of the political and economic elements impacting K-12 school finance. Content and activities address both building and district level concerns with an emphasis on principles, programs, and trends in school finance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 985

EDAD 835 Business Management of Schools

Description: Allocation and management of fiscal resources including aspects of financial planning and reporting, budgeting and accounting procedures, purchasing, risk management and insurance, investing and bond issues, and auxiliary service.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 837 Education Law

Description: Evolution, principles, and practice of education law in relation to local, state, and national units of organization. Education law of Nebraska.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDAD 838 Program Evaluation and Assessment of Student Affairs

Description: Review of a variety resources used to evaluate programs and assess student learning in student affairs programs. Presentation of theory and practice with various tools for the assessment and evaluation of student affairs programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

EDAD 839 Educational Facilities

Description: Techniques for planning educational facilities through use of surveys, educational specifications, and standards. Function of the school administrator in school facilities planning, construction, and utilization.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 840 College Student Development

Description: Introduction to human development theories; psychosocial, cognitive, and structural theories, with a focus on learning to use theory to improve skills in working with students.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 842 College Students in America

Description: This course is designed to provide students an understanding of a broad range of facts and issues pertaining to undergraduate college students in America.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 843 Counseling Principles for Educational Administrators

Description: This is an introductory level counseling course designed specifically for educational administrators. It is not intended to prepare individuals to become professional counseling practitioners. It offers a broad overview of counsel principles. This is a theory-to-practice course.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 844 Human Resources Management in P-12 Educational Organizations

Description: Human resources and personnel work in education. Relevant for school administrators and leaders who lead human resource activities including recruiting, hiring, induction, professional development, evaluation, and compensation. Roles and responsibilities of superintendents, HR professionals, building principals, and other supervisors are considered through readings, discussions, activities, and case studies. For graduate students who are pursuing Master's or Doctoral degrees and/or administrative certification in educational administration. Students in other areas who are interested in planning, organizing, and implementing human resource programs might also find the course of interest.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 845 Human Resources Management in Higher Education

Description: The various aspects of human resources (HR) management and how they contribute to mission accomplishment and organizational success in American higher education (HIED). Students will examine traditional HR responsibilities (e.g., recruitment and selection, supervision and utilization, evaluation, professional development, pay and benefits, etc.) and how these activities operate within a college/university setting. Strategic HR planning concepts will be emphasized for optimizing human capital and strengthening institutional capabilities in the ever-changing HIED environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 846 Studies in Professional Development Leadership

Description: Equips leaders to develop educational organizations that value professional development and match research-based professional learning to meet the daily needs of students. Creation of a professional learning culture to provide opportunity for professional learning opportunities. Improve effectiveness in increasing student achievement.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

EDAD 846A Studies in Professional Development Leadership: Professional Learning Cultures

Description: Equips leaders to develop educational organizations that value professional development and match research-based professional learning to meet the daily needs of students. Creation of a professional learning culture to provide opportunity for professional learning opportunities. Improve effectiveness in increasing student achievement.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

EDAD 846B Studies in Professional Development Leadership: Professional Development Design

Description: Equips leaders to develop educational organizations that value professional development and match research-based professional learning to meet the daily needs of students. Creation of a professional learning culture to provide opportunity for professional learning opportunities. Improve effectiveness in increasing student achievement.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

EDAD 846E Issues in Ensuring Quality Professional Development

Description: Students will examine emerging issues related to selected educational leadership challenges and develop implementation strategies for resolving these issues. Using the standards for professional development identified by Learning Forward (formerly the National Council for Staff Development), students will review the literature and define the selected issue, discuss and evaluate examples of best practice, complete case study analysis activities, and collaboratively develop a professional development plan of response.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 846J Effective Professional Development: Roles and Responsibilities

Description: Educators must utilize a roadmap to provide quality professional learning opportunities for teachers, principals, superintendents, boards of education and education stakeholders. This course will enable participants to use professional development standards focused on context, process and content identified by learning forward, formerly the National Staff Development Council, to deliver high quality professional development based on your specific role and responsibilities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 846K Evaluating the Effectiveness of Professional Development

Description: Every professional development initiative must yield results that are measurable and allow educators to continually improve their effectiveness. Ultimately, improving educator effectiveness enhances student achievement. This course will focus upon designing initiatives and measuring the impact of professional learning for all educational stakeholders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 851 Faculty and Staff Appraisal

Description: Faculty and support staff in P-12 schools: appraisal, professional learning communities, high standards/high performance and accountability.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 852 School Culture and Student Behavior

Description: School culture and student behavior in P-12 schools. Personalized teaching and learning environments that address student diversity, needs and interests.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 855 Teaching Learners to Learn

Crosslisted with: EDPS 855, NUTR 855, SPED 855, TEAC 855

Description: Effective teachers facilitate student learning. Facilitating student learning depends on understanding learning principles and on designing instruction that is compatible with learning principles. Instructors can provide learning-compatible instruction that helps students learn more effectively and ultimately teaches them how to learn. Assists teachers to teach in learning-compatible ways and helps them embed within their curriculum a program for teaching learners to learn.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 856 Supervising Special Education

Crosslisted with: SPED 856

Description: For principals or other administrators who have special education programs in their buildings. Overview of disabilities, related law, special education programs, personnel issues, etc., and instructional methods and administrative support for effective integration of disabled students into regular programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 857 Special Education Administration

Crosslisted with: SPED 857

Description: Intensive preparation for special educators who intend to administer special education programs in the public schools. Information about best practices in special education, including programming, supervision, legal/regulatory issues, financing, personnel, as well as current controversial topics which are affecting these programs in the schools.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 858 Special Education Law**Crosslisted with:** SPED 858**Description:** Body of law that pertains to the organization, administration, and implementation of special education programs in PreK-12 schools. Substantive and procedural rights of disabled students, and the authority and responsibility of states and school districts that are grounded in state and federal law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 879 Introduction to Student Affairs****Description:** Current professional issues related to the organization and administration of student personnel within higher education. Exploration of research literature, some field experiences, and in-depth examination of special topics.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**EDAD 880 Student Affairs Seminar****Notes:** EDAD 880 is 1 credit hour seminar experience for students in the Student Affairs cohort. The course is a face-to-face course that meets seven times (approximately 2 hours per session) during the course of a semester. The course will include guest speakers, various group activities, and discussion of selected special topics related to student affairs.**Description:** Student Affairs Program cohort members meet to discuss and review current issues in order to become more familiar with special topics related to professional practice and best practice in the field of student affairs.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**EDAD 880B Teaching with Technology: Designing Instructional Technology K-12****Crosslisted with:** TEAC 480B, TEAC 880B**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 890 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**EDAD 892 Special Topics in Education****Crosslisted with:** EDPS 892, EDUC 892, SPED 892, TEAC 892, CYAF 892**Prerequisites:** EDPS 859 or parallel; EDPS 859 or equivalent**Description:** Aspects of education not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 893 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**EDAD 893N Workshop Seminar****Crosslisted with:** TEAC 893N, EDPS 893N, SPED 893N**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**EDAD 896 Independent Study****Prerequisites:** Permission**Description:** Selected topic with the direction and guidance of a staff member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**EDAD 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**EDAD 900 Pro-Seminar in Educational Leadership and Higher Education****Description:** Provides an opportunity for doctoral students in Educational Leadership and Higher Education to gain a better understanding of the expectations and skills necessary for doctoral education. Students will gain knowledge of the skills and habits necessary to successfully navigate their doctoral program. In addition, the foundations of educational inquiry as well as personal development related to research will be addressed, including the development of critical reading and thinking skills, writing skills, and analytical skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

EDAD 900J Historical Methods in Educational Research**Crosslisted with:** EDPS 900J**Description:** Connections in the general study of history to the study of the history of education. Concepts employed in educational historical research and the methods used by historical researchers. The methodology of historical research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 901 System-Level School Improvement****Description:** Knowledge and skills required for system-level leaders to bring about school improvement and enhance student achievement. Creating systems that engage the public, performing in complex political environments, and delivering needed services to schools and classrooms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 902**EDAD 902 Data for Decision Making****Prerequisites:** EDAD 901.**Description:** Assessment theory and types of assessments used to measure student performance relative to a school improvement goal. Relationships between profile data and baseline data, locally developed classroom assessments, and post data pertaining to school improvement goals and action plans.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 903 Issues in Community Relations****Description:** Principles of community relations and public relations; development of school and community understanding; collaboration of educators and community agents and agencies; communication tools and evaluation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDAD 904**EDAD 904 Analysis in Continuous Improvement****Prerequisites:** EDAD 903.**Notes:** EDAD 904 requires generating recommendations for proceeding into the next cycle of school improvement and conducting a personal self-analysis of improvement process skills and obtain information from supervisors and/or colleagues regarding abilities as a**Description:** Analyze how staff attitudes and behaviors are impacted through the improvement process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 905 Issues in Governance of Educational Institutions****Description:** Issues in the governance of K-12 schools including administrator-school board roles and relationships.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 906 Issues in System Level Administration****Prerequisites:** Masters degree or equivalent.**Description:** Selected system level issues faced by pre-K to grade 12 school administrators.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 907 Issues in Educational Politics and Policies****Description:** Analyze and evaluate policy processes involved in making choices; develop understanding, apply and evaluate knowledge about key political concepts and theories to the analysis of educational policy issues; analyze and evaluate issues as points of political conflict between institutional structures with competing interests; understand people as the actors in roles they occupy in the political system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 909 Seminar in Human Resource Development****Prerequisites:** EDAD 821 or 822**Description:** Current research and theory within the field of human resource development, broadly defined. Stresses key problems affecting the training, development, and education of human resources within organizational settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 910 The Higher Education Environment****Description:** Universities are adaptive, living systems interacting with their environment. Equips participants with the skills required to analyze and assess the environment of higher education institutions. Environment concepts, components and structures are studied together with analysis techniques and methodological approaches to future study.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDAD 912A Educational Leadership in Higher Education****Description:** Strategic thinking, application of leadership theories in the educational setting. Develop a clear personal philosophy of leadership and engage in collaborative active-learning. Multimedia simulations and/or scenarios and role playing to examine options, consequences, and leadership effectiveness in decision-making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

EDAD 912B Emerging Issues in Community College Leadership

Description: Issues facing community college leaders and the knowledge, skills, and competencies necessary to provide effective leadership in the community college setting. Case studies of community colleges, combined with the literature on community college leadership, and active learning opportunities to examine current practices and develop a personal philosophy of leadership.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 915 Educational Systems and Governance

Prerequisites: Admission to doctoral program in Educational Administration

Description: This course is for doctoral students who are current or prospective administrators, researchers, and/or policy analysts in higher education and educational leadership. Students will examine how educational systems, in particular higher education but across the PK-12+ pipeline, are structured and elaborate critiques of those structures through new and emerging frameworks for understanding why and how they work. Students will examine the governance of educational institutions from the federal, state, and institutional perspectives. The impact of demographic, social, legal, political, and financial influences on governance in higher education will also be explored. Students will explore research, policy, and practice implications of issues in educational governance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 920 Diversity and Equity in Educational Organizations

Description: Understanding the individual and organizational issues of diversity and multiculturalism in P-20 schools. Increase the students' knowledge and appreciation of: cultural, social, political, and economic realities of our complex, pluralistic society in relation to our educational system. Through integration of relevant information from history, law, interpersonal development, organizational development, and philosophy, students will develop a complex, comprehensive understanding of diversity and equity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 921 Administrative Issues in Higher Education

Description: Introduction to contemporary issues in the administration of higher education with a focus on the scholarly literature, a comparative analysis of administration in types of institutions, leadership and planning, institutional environmental issues, and selected topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 922 Finance in Higher Education

Description: Federal and state government funding, institutional planning, technological and community influences, human resources finance, budgeting, and sources of financial support as they relate to higher education institutions and agencies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: EDAD 985

EDAD 923 The Community/Junior College

Description: Designed particularly for those interested in upper secondary and college levels. Junior college movement; relationship of movement to provisions for an adequate educational program; functions of the junior college; legal status and basis for extension of junior college; problems of organization, administration, and curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 924 Teaching, Learning, & Curriculum in Higher Education

Description: Diverse perspectives, current issues and challenges pertaining to teaching, learning, and curriculum in higher education. For individuals who hold or in the future will serve in administrative, teaching, research or policy positions that require understanding of philosophical and theoretical underpinnings of teaching and learning in higher education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 925 Law and Higher Education

Description: Examination of legal principles applicable to higher education institutions. Overview of the legal system, higher education institutions as legal entities, authority for governance and administration, faculty rights and responsibilities, student rights and responsibilities, institutional and personal liability, and other selected issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 926 The American Professoriate: An Administrative Perspective

Description: Contemporary faculty issues in postsecondary education institutions from the perspective of college administrators. Current status of faculty, assigning faculty workloads and monitoring performance levels, evaluating faculty performance, structuring development activities, and special topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 929 Organizational Development and Change

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 931 Higher Education Information Systems

Description: Foundation in management information systems. Issues in information systems, current research and writings, key terms, and how information systems impacts organizational culture, business processes, work-flow, and overall operations of an institution. The roles in the application, analysis, and management of higher education administration technology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 932 Global Issues in Higher Education

Description: Selected issues affecting global educational policies and practices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 933 Strategic Planning

Description: System theory, practice and problem solving. The strategic planning process in higher education. Models of strategic planning. EDAD 933 requires the student to analyze their respective institution's planning process and plan, and to participate in a simulation activity that reinforces the principles and practices of strategic planning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 934 Teaching and Learning in the Community College

Description: Develop comprehensive understanding of five aspects of the community college: Curricular missions in general education, transfer education, career education, remedial/developmental education and community education; faculty and student populations; exemplary teaching and assessment of student learning outcomes; program and curriculum development; and human resources aspects related to instructional programs in hiring faculty and providing faculty development programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 935 Workforce, Economic, and Community Development

Description: Workforce, economic and community development role of higher education within the broader context of recent economic, social, and technological changes in communities, society, and the economy. Applicable to higher education in general with an emphasis on the example of two-year community colleges.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 936 Higher Education Planning

Description: Rationale for planning in a changing environment will be explored; the theoretical base for planning presented; strategic, futuristic planning and operational planning explored; the development of planning strategies, techniques and procedures; the process of evaluation, feedback and revisions explored; and the management of the change process analyzed.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 948 Instructional Leadership: Emerging Trends and Practices

Crosslisted with: TEAC 948

Description: Changing roles for persons engaged in instructional and curricular leadership in educational institutions. Literature on staff development, assessment and evaluation, and effective schools serve as the basis for studying and applying this information to a variety of educational settings. Issues such as teacher empowerment and site-based management, along with cooperative learning provide the focus of the activities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 960 Public Employment Law

Description: Legal issues relating to public employment with particular emphasis on public schools and colleges; collective bargaining by public employees, impasse, and resolution of public employee disputes; grievances, arbitration, and enforcement of agreements; civil rights of public employees; and laws applicable to public employment apart from collective bargaining, such as discrimination acts, wage and hour laws, retirement plans, and public records.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDAD 961 Trial Advocacy

Prerequisites: LAW 646G.

Description: Students perform weekly exercises which are videotaped and critiqued and will try a case. Fundamentals of trial practice. Emphasis on questioning witnesses, selecting and addressing the jury, and admitting items into evidence.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDAD 963 Legislation Seminar

Description: Development of further skills in drafting and interpreting statutes, understanding legislative processes and decision making, and evaluating the role of legislation in governmental regulation. Opportunity for in-depth study of subjects pertaining to or involving legislation, centering on subjects considered by the Nebraska Legislature and the Nebraska legislative process.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDAD 966 Seminar in Educational Administration

Prerequisites: Permission.

Description: Education administration problems with an analysis of research and literature pertaining to these problems.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

EDAD 973 Jurisprudence

Description: Examines central jurisprudential questions that arise in the criminal law. The following topics will be considered: (1) the purpose and justification of punishment, especially the legitimate role, if any, for retribution and the expressive function of punishment; (2) the relationship between retribution and revenge; (3) the justification of capital punishment; (4) the relationship among the state, defendants, and victims in the criminal process, including the proper role, if any, of victim impact statements.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 976 Legal Control of Discrimination

Description: Selected legal issues pertaining to the legal control of discrimination.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDAD 977 Constitutional History

Description: American constitutional history with a focus on "transformative" moments at which the Constitution and the nature of American politics and government changed. American Revolution and the framing of the Constitution and Bill of Rights, Civil War and Reconstruction, and the New Deal. Exploration of the courts and how they stood on history and original intent when they interpret the Constitution.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 980 Seminar in College Student Development

Crosslisted with: EDPS 977

Description: Current knowledge, theories, and practices, and related issues in the area of college student development.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

EDAD 981 Intermediate Quantitative Methods for Educational Administration Research

Prerequisites: Graduate standing, introductory research methods course and intermediate quantitative methods course

Description: Introduction to the concepts, principles, and methods in intermediate statistical analyses for educational administration research, with a focus throughout on applied data analysis. The frame of reference for this course is experimental and ex post facto research designs. We will review of descriptive statistics (including measures of central tendency, variability, proportions, and basics of probability theory), however, this course particularly focuses on inferential statistics (for example, bivariate correlation, t-tests, one-way ANOVA, chi-square, discriminate analysis, and linear regression). All concepts will be taught from an applied perspective. This course also provides hands-on application of planning, conducting, and reporting of analyses using APA style.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 982 Advanced Quantitative Methods for Educational Administration Research

Prerequisites: Grad standing. Successful completion of an introductory research methods course & an intermediate quantitative methods course, including in particular knowledge of ANOVA techniques & at least a brief introduction to multiple regression.

Description: Concepts, principles, and methods in advanced statistical analyses for educational administration research, with a focus throughout on applied data analysis. The frame of reference for this course is correlational and multivariate research designs. A variety of analytical approaches, in particular multiple regression, logistic and multinomial regression, factor analysis, and an introduction to concepts of multilevel models and structural equation modeling, among other possible topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 983 Qualitative Methods for Educational Administration Research

Prerequisites: EDAD 800

Description: An overview of concepts and approaches to qualitative methodology in educational administration research including major methodological approaches (e.g. case study, ethnography, phenomenology, grounded theory, and narrative inquiry). Overview of approaches to qualitative research design, fieldwork, data collection, and data analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 984A Historical Methods of Research

Description: Connections of the general study of history to the study of the history of education are the course's intents. Concepts employed in educational historical research and the methods used by historical researchers will be examined. Knowledge and skills will be developed through practical exercises demonstrating the methodology of historical research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 984B Qualitative Techniques - Case Study Methods

Description: Provides an introduction to case study methodology, with a focus on qualitative data collection and analysis. Focus on two traditions of case study methodology used in educational research (Yin and Stake). Learn about case study design from start to finish and conduct and write a small scale case study using either own data or data provided by the instructor.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

EDAD 985 Economics of Education P-20

Prerequisites: EDAD 833 or 922

Description: This course focuses on (1) the costs of public and private education to society and to individuals, (2) the expected benefits to students, to communities and to society in general and (3) the research associated with those costs and benefits as a result of continued engagement in education in P-20 settings and life experiences in community/family settings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 986 Leadership in Educational Organizations

Description: The examination of leaders and leadership in educational organizations. Through assigned readings and written assignments, students will make applications of the readings to: a) the organization of educational institutions and programs, b) the leadership that occurs in educational organizations and programs, c) the leadership skills and actions that are necessary to achieve the mission, goals, and objectives of educational organizations, and d) the student's individual leadership growth and development.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 987A Superintendent Academy I

Prerequisites: Permission.

Description: A forum for dialogue and an exchange of ideas and experiences while creating a network of support for colleagues. Exploration and developing the skills, knowledge, understandings and unique features required of the superintendent's roles and responsibilities. Multiple perspectives on effective leadership and participants will be challenged to look at educational issues in new ways. Participants will be encouraged to bring contemporary educational issues to the sessions for intensive, confidential review and discussion. Interaction with session leaders and participants will be facilitated in an effort to examine the rapidly changing realities of public education and the impact these changes are having on the roles/responsibilities of the public school superintendent.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 987B Superintendent Academy II

Prerequisites: Permission.

Description: Designed to provide future school superintendents a link between theory and practice through case studies and voice-of-experience discussions. This academy is a forum for processing the "on-the-job" experiences with participants who are pursuing doctoral studies, those who are about to enter the role of the superintendent, or those who are new to the work of school leadership. Provides training situations for developing leadership skills, examination of the practical challenges that school leaders face. Examination of contemporary educational issues through different organizational frameworks and review of various issues related to the management of change.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 987C Superintendent Internship

Prerequisites: Permission.

Description: Opportunity for educational administrators to gain an understanding of administering changes or innovations, and to obtain supervised field experience. Consideration will be given antecedents of change, change models, the role of government, forces that restrict or stimulate change, tools to implement change, and evaluation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 988 Dissertation Proposal Development

Prerequisites: Admission to a doctoral program

Description: Intended for students who are working on the development of their dissertation proposal. Component parts of the dissertation proposal. Students from all areas of Teachers College and the University of Nebraska who are in the process of developing their proposal will find this course to be of use. Typically the course should be taken after the research tools have been completed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDAD 989 Survey of Administrative Research

Description: Intended primarily for students of education who are candidates for doctoral degrees. Readings, discussions, and an analysis of educational problems and research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: IND

EDAD 990 Workshop Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

EDAD 991 Field Studies in Education

Crosslisted with: NUTR 991, TEAC 991

Prerequisites: Permission

Description: Identification and solutions of problems associated with program planning; organizational, administrative, and instructional procedures within an institutional setting. Designing, implementing, and evaluating new or modified patterns of operation and teaching within a public school, postsecondary institution, or adult education agency.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

EDAD 993 Workshop Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

EDAD 995 Doctoral Seminar

Prerequisites: Permission

Description: Students are immersed in outcome-based scholarly activities with a faculty mentor. Working on either an individualized or small group basis, students develop, execute and report one or more projects addressing the interaction between research and practice. Intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: IND

EDAD 998 Internship in Educational Administration

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: IND

EDAD 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Educational Psychology (EDPS)

EDPS 800 Foundations of Educational Research

Notes: EDPS 459/859 or equivalent is recommended

Description: Purposes and characteristics of research process, selection of research problems in education and social sciences, critical review of published research, research ethics and institutional review, sampling methods, threats to validity in research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 845 Computer-Assisted Research Data Analysis

Notes: Pass/No Pass only. One statistics course beyond EDPS 859 is recommended.

Description: Statistical software packages for both mainframe and microcomputers. How to develop and manage data files; how to transfer data files between computers; and principles of data transformation and selection.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 846 Foundations of Health Behavior

Crosslisted with: NUTR 846

Description: The epidemiological, developmental and cognitive foundation of health-related behaviors and identifies opportunities for health promotion and education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 847 Theoretical Models of Health Behavior Change

Crosslisted with: NUTR 847

Description: Application of widely used theoretical models of health behavior change. Specification of behaviors and development and evaluation of theory-based interventions to reduce health-related risks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 850 Child Psychology

Crosslisted with: EDPS 450

Description: Advanced study of the behavior and development of preschool and elementary school children.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: EDPS 961; EDPS 962; EDPS 963

EDPS 851 Psychology of Adolescence

Crosslisted with: EDPS 451

Description: Mental, social, and emotional development of boys and girls during the adolescent period.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: EDPS 961; EDPS 962; EDPS 963

EDPS 853 Psychological Assessment I**Prerequisites:** EDPS Masters students only.**Description:** Basic assessment and testing skills including "behavioral observation", psychometric issues, intake/diagnostic interviewing, psychological testing, test interpretation feedback, and integrative report writing. Commonly used screening instruments, personality tests, career interest inventories, and symptom-based tests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 854 Human Cognition and Instruction****Crosslisted with:** EDPS 454**Description:** Cognitive psychology and its applications in instruction. Memory, problem solving, cognitive process in reading, research approaches, and applications to teaching.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 960; EDPS 967**EDPS 855 Teaching Learners to Learn****Crosslisted with:** EDAD 855, NUTR 855, SPED 855, TEAC 855**Description:** Effective teachers facilitate student learning. Facilitating student learning depends on understanding learning principles and on designing instruction that is compatible with learning principles. Instructors can provide learning-compatible instruction that helps students learn more effectively and ultimately teaches them how to learn. Assists teachers to teach in learning-compatible ways and helps them embed within their curriculum a program for teaching learners to learn.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 859 Statistical Methods****Crosslisted with:** EDPS 459**Description:** Computation and interpretation of measures of central position, variability, and correlation; introduction to sampling, probability, and tests of significance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ABUS 341, MRKT 341; ASCI 330; BLAW 371; BLAW 371H; EDAD 892, EDPS 892, EDUC 892, SPED 892, TEAC 892, CYAF 892; EDPS 470, EDPS 870; EDPS 860; EDPS 936; EDPS 941, SRAM 941; EDPS 942, SRAM 942; EDPS 969; FINA 361; FINA 361H; MNGT 301; MNGT 301H; MRKT 821; MUED 980; NUTR 486, NUTR 886; SCMA 331; SCMA 335; SCMA 350; SCMA 350H; SCMA 350L; STAT 318; STAT 432**EDPS 860 Applications of Selected Advanced Statistics****Prerequisites:** EDPS 859**Description:** Variety of parametric and nonparametric analyses, including analysis of variance (completely randomized design and various factorial designs), regression analysis, analysis of covariance, full model stepwise multiple regression, chi square Mann-Whitney U, and Wilcoxon test. Understanding and application of these analyses. Appropriate mainframe and microcomputer statistical packages utilized to assist in the numerical analysis of data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 863 Introduction to Applied Behavior Analysis****Crosslisted with:** EDPS 463**Description:** Research methods and findings, concepts, and principles of operant conditioning as related to the experimental analysis of human behavioral events and to the development of behavior engineering technologies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 952**EDPS 866 Counseling Pre-Practicum****Prerequisites:** EDPS Graduate Student**Description:** Counseling skills required for basic, entry-level clinical work. Practicing skills, receiving peer/instructor performance feedback, and role-playing clinical situations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 964; EDPS 997A**EDPS 867 Ethical and Professional Practice in School Psychology****Description:** Foundations, models, and practices of contemporary school psychology and an exploration of transitions and future developments in the profession. Investigations of the major legal and ethical systems affecting school psychologists and the application of standards for professional practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 868 Multicultural Counseling****Prerequisites:** EDPS Graduate Student**Description:** Ethnic subcultures in the US, cross-cultural communication systems, and change strategies. Cultural cues and barriers in counseling, personal assumptions and values, and active experiencing of cultural diversity in the counseling relationship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

EDPS 869 Psychopathological Disorders of Childhood and Adolescence**Crosslisted with:** EDPS 469**Description:** Investigation of the genesis, course, classification, and treatment of function and organic pathologies found in children and adolescents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 870 Introduction to Educational and Psychological Measurement****Crosslisted with:** EDPS 470**Prerequisites:** EDPS 459/859 or equivalent.**Description:** Introduction to the construction, evaluation, and ethical use of measurement instruments commonly used in education and psychology. Test construction principles, item analysis, reliability, validity, ethical issues in testing, and evaluation of standardized tests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 970, SRAM 970; EDPS 980**EDPS 871 Human Sexuality and Society****Crosslisted with:** CYAF 471, EDPS 471, PSYC 471, SOCI 471, CYAF 871, PSYC 871, SOCI 871**Prerequisites:** Junior standing.**Notes:** Open to advanced students planning careers in the professions in which knowledge of human behavior and society is important (e.g., helping professions, medicine, law, ministry, education, etc.).**Description:** Interdisciplinary approach to the study of human sexuality in terms of the psychological, social, cultural, anthropological, legal, historical, and physical characteristics of individual sexuality and sex in society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 878 Pro-seminar in Latin American Studies****Crosslisted with:** ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, GEOG 878, HIST 878, POLS 878, SOCI 878, MODL 878**Prerequisites:** Junior standing and permission.**Notes:** Topical seminar required for all Latin American Studies majors.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Integrative Courses, Research Regional Geography Lat Am, Asian, Middle East Hist International Relations & Compar**EDPS 890 Workshop Seminar****Prerequisites:** Permission of instructor**Notes:** Refer to Workshop Seminars in Education under the ¿Education¿ section of this bulletin.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**EDPS 892 Special Topics in Education****Crosslisted with:** EDAD 892, EDUC 892, SPED 892, TEAC 892, CYAF 892**Prerequisites:** EDPS 859 or parallel; EDPS 859 or equivalent**Description:** Aspects of education not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 893N Workshop Seminar****Crosslisted with:** TEAC 893N, EDAD 893N, SPED 893N**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**EDPS 896 Directed Field Experience****Crosslisted with:** EDPS 496**Prerequisites:** Permission.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** FLD**EDPS 897J Gifted/Talented****Crosslisted with:** SPED 897J**Prerequisites:** Permission of instructor.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 15**Format:** FLD**EDPS 898 Special Topics****Crosslisted with:** EDPS 498**Prerequisites:** Permission.**Description:** Seminar on current issues or topics in educational psychology. Topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**EDPS 899 Masters Thesis****Prerequisites:** Permission**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND

EDPS 900A Correlational and Experimental Methods in Educational Research

Notes: EDPS 800 and EDPS 859 or equivalents are recommended.

Description: Integrated view of correlational and experimental research in education and social sciences. Builds on idea of relationships among variables and concept of casual relationships between variables. Possible research designs in light of these general principles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 900B Single-Case Experimental Designs in Educational Research

Description: Philosophical, strategic, and practical issues in conducting experimental research with single-case experimental designs. There is special emphasis on quantifying behavior, arranging and carrying out experimental comparisons, analysis of data, and drawing valid conclusions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 900D Survey Methods in Educational Research

Notes: EDPS 800 and EDPS 859 or equivalents are recommended.

Description: Principles and applications of survey research. Use of appropriate sampling techniques and applications of survey methods to the study of relative incidence, distribution, and interrelations of educational, sociological, and psychological variables.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 900J Historical Methods in Educational Research

Crosslisted with: EDAD 900J

Prerequisites: EDPS 800 or equivalent; EDPS 459/859 or equivalent

Description: Connections in the general study of history to the study of the history of education. Concepts employed in educational historical research and the methods used by historical researchers. The methodology of historical research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 900K Qualitative Approaches to Educational Research

Notes: EDPS 800 and EDPS 859 or equivalents are recommended.

Description: Uses of qualitative research methods in education. The theoretical premises of research using qualitative methods and the application of this information through critique and planning research. Qualitative methods for data collection.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: EDPS 935, TEAC 935; EDPS 936

EDPS 905 Research and Evaluation Literature on Health Promotion

Crosslisted with: NUTR 905

Description: Philosophical and empirical review and critique of contemporary literature on school, community, work place and health care-based health promotion and education programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 921 Creativity and Talent Development

Description: Examination of creative and talented people in various domains and analysis of the psychological, environmental, social, and biological factors that lead to creativity and talent. Implications for self-growth, education, and parenting.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 922 Mind, Brain, and Education

Description: Introduction to educational neuroscience, which has increasingly gained prominence as an interdisciplinary science that integrates neuroscience, psychology, and education. Examine the links between educational issues and the brain and apply the neuropsychological knowledge to their academic interests, such as teaching, learning, and child/adolescent well-being in schools. Widely covers current trends and research in neuroscience, physiology, and genetics that have implications for promoting learning performance and healthy development in children and adolescents.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

EDPS 930 Sociological/Anthropological Research Methods in Education

Crosslisted with: CYAF 930, NUTR 930, TEAC 930

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

EDPS 930A Ethnographic Methods

Crosslisted with: CYAF 930A, NUTR 930A, TEAC 930A, ANTH 930A

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 930B Special Topics in Qualitative and/or Quantitative Research Methods**Crosslisted with:** CYAF 930B, NUTR 930B, TEAC 930B**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**EDPS 930D Discourse Analysis Across School, Home and Community Settings****Crosslisted with:** CYAF 930D, NUTR 930D, TEAC 930D**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 930E Introduction to Linguistic Analysis of Classroom Interaction****Crosslisted with:** CYAF 930E, NUTR 930E, TEAC 930E**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 930J Hermeneutic Traditions in Education****Crosslisted with:** CYAF 930J, NUTR 930J, TEAC 930J**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 930K Quantitative Research Traditions in Education****Crosslisted with:** CYAF 930K, NUTR 930K, TEAC 930K**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 930M Introduction to Multimodal Textual Analysis****Crosslisted with:** CYAF 930M, NUTR 930M, TEAC 930M**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 935 Seminar in Qualitative Research****Crosslisted with:** TEAC 935**Prerequisites:** EDPS 900K**Description:** Seminar intended for doctoral-level students who have completed an initial qualitative research methodology course and who want to increase their skills in qualitative research. Data collection and analysis strategies and the application of those strategies to research problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 936 Mixed Methods Research****Prerequisites:** EDPS 859 and EDPS 900K**Description:** EDPS 936 is for students already familiar with quantitative and qualitative research. An introduction to mixed methods research as a distinct methodology in social science research. Topics include the value and use of this approach, philosophical assumptions, various types of design, and approaches to designing and conducting mixed methods research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 941 Intermediate Statistics: Experimental Methods****Crosslisted with:** SRAM 941**Prerequisites:** EDPS 859 or EDPS 942**Description:** Computation, interpretation, and application of analysis of variance techniques, including factorial and mixed model designs. Computer and microcomputer software accessed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 942, SRAM 942**EDPS 942 Intermediate Statistics: Correlational Methods****Crosslisted with:** SRAM 942**Prerequisites:** EDPS 859 or EDPS 941**Description:** Various correlational-based statistical procedures presented, including linear and nonlinear regression, multiple regression, statistical control, analysis of interactions, the general linear model, factor analysis, and discriminant analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 941, SRAM 941

EDPS 948 Multicultural Issues in School Psychological Service Delivery**Prerequisites:** Permission of instructor.**Description:** Current issues related to psycho-educational service delivery to children and families from different cultural and linguistic backgrounds. Integrating research and field experiences to provide students with skills to develop, implement, and deliver culturally sensitive and effective school psychological services.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 949 Cognitive and Behavioral Therapy with Children and Adolescents****Prerequisites:** Permission**Description:** Cognitive and behavioral techniques. Theoretical issues, application and evaluation of major empirically-validated therapeutic treatments that represent best practices in child and adolescent therapy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 950 Intellectual Assessment****Prerequisites:** Permission of instructor.**Description:** Formal evaluative methods for the investigation of children's learning difficulties, including supervised practicum in administration, scoring, and interpretation of individually administered tests of cognitive abilities.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**EDPS 951 Academic and Behavioral Assessment****Prerequisites:** Permission of instructor.**Description:** Advanced study of the theory and practice in the assessment of educational and psychological problems of children and youth to include assessment of systems that impact on the behavior of children and youth. Assessment techniques include environmental observation, interviewing, standardized assessment procedures for academic skills, adaptive behavior, social and emotional problems, curriculum based assessment, and functional analysis and assessment. Ecological-behavioral basis of assessment is explored. A complete psychological and educational evaluation is conducted in a school or other relevant setting.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**EDPS 952 Systems of Consultation in School Psychology****Prerequisites:** EDPS 863**Description:** Intensive analysis of the theory and practice of various systems of mental health consultation in the schools with special emphasis and practicum with mental health service models other than conventional clinical, psychometric, and direct psychoeducational remediation models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 953 Psychological Assessment II****Prerequisites:** EDPS Doctoral Student**Description:** Advanced assessment and testing skills. Selection, administration and interpretation of a battery of psychological tests and integration and synthesis of relevant test and non-test data into an accessible report writing format. Development of effective consultation and test interpretation feedback skills.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** EDPS 956**EDPS 954 School Mental Health and Behavior Interventions****Crosslisted with:** SPED 954**Description:** Understanding of models for the delivery of mental health services in schools; and plan and deliver psychosocial interventions in school settings. Evidence-based interventions delivered at the classroom and school-wide levels emphasized with a three-tiered prevention model of service delivery appropriate for culturally and linguistically diverse students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 955 Child Therapy****Prerequisites:** Permission of instructor.**Description:** Advanced practicum course that facilitates students' scholarly acquisition of principles and concepts relevant to conducting therapy, and provides opportunities for practical integration of knowledge and skills essential to conducting individual, group, and family psychotherapy. Students acquire competencies in developing, implementing and evaluating interventions by conducting therapy sessions, observing sessions, exchanging feedback with peers, and receiving supervision.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**EDPS 956 Projective Psychological Assessment****Prerequisites:** EDPS 953 or EDPS Doctoral Student**Notes:** Permission may be granted by Instructor to take Psychological Assessment II after Projective Psychological Assessment.**Description:** The primary goal of this course is to assist doctoral students in developing their ability to utilize projective assessment techniques to integrate information from a variety of sources about a person (an adult or older adolescent) into an integrated, useful psychological report. The broad array of data will include not only the results of formal tests (e.g., the Rorschach), but also personal and family history, and behavioral observations.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING

EDPS 958A Internship in School Psychology**Prerequisites:** EDPS 958A**Description:** Full-time supervised practice of school psychology in the facilities of public or private schools of educational service agencies.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 12**Format:** FLD**EDPS 958B Practicum in School Psychology Consultation Techniques****Prerequisites:** Permission of instructor.**Description:** Practicum experience in ecological/behavioral, mental health, and organizational consultation techniques within a school or related setting. Supplemented by individual and small group supervisory/feedback sessions each week.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 8**Format:** LEC**EDPS 959 Professional Psychology Internship (Doctoral)****Prerequisites:** Permission of program director.**Description:** Full-time or half-time supervised practice of psychology and related research in schools and supportive mental health and health agencies with emphasis on assessment, diagnosis, and treatment of mental, emotional, and behavioral disorders.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 15**Format:** FLD**EDPS 960 Advanced Cognitive Psychology in Education****Prerequisites:** EDPS 854**Description:** Critical study of the non-Piagetian research literature and theory focusing on higher mental processes in humans through the lifespan. Key course topics include current memory models, encoding and retrieval processes, cognitive load theory, problem solving and critical thinking as well as theories of transfer and expertise development. The effects of self-regulatory processes, social contexts, and beliefs on cognition and learning also are important course emphases.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**EDPS 961 Cognitive Development****Prerequisites:** EDPS 850 or EDPS 851**Description:** Critical examination of theories and research on cognitive development throughout the lifespan, including Piagetian and alternative perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 962 Research Literature in Personality and Social Development****Prerequisites:** EDPS 850 or EDPS 851**Description:** Critical examination of the concepts and principles derived from the study of personality and social development with special emphasis on the research literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 963 Developmental Psychobiology****Prerequisites:** EDPS 850 or EDPS 851**Description:** Biological foundations of human psychological development, including anatomical, physiological, and evolutionary considerations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 964 Counseling Theories and Intervention Techniques****Prerequisites:** Prereq: EDPS 866**Notes:** Parallel: EDPS 997A and permission of counseling area.**Description:** Overview of theoretical approaches to counseling. Close examination of selected theories and intervention procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 965A Group Counseling: Social Psychological Aspects****Prerequisites:** EDPS Graduate Student**Notes:** Parallel: EDPS 964 and 997A.**Description:** Develops student competencies in analyzing organizational contexts, designing group counseling experiences, and evaluating group experiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 966 Psychology of Learning****Notes:** EDPS 854 or equivalent is recommended.**Description:** Theories of learning and experimental investigation in the field of animal and human behavior and their application to the classroom.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 967 Psychology of Motivation in Education****Prerequisites:** EDPS 854**Description:** Psychology of Motivation focuses on understanding and impacting students' motivation to learn. Theories discussed in this class are applicable to a wide array of achievement settings (e.g., math, science, writing, health education) as well as more general motivational concerns (e.g., studying, addiction, video games). Content covered includes drive theory, behaviorism as motivation, achievement motivation, goal theory, self-determination theory, social cognitive theory, and ecological theories of motivation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

EDPS 968 Gender and Counseling Psychology**Prerequisites:** EDPS Graduate Student**Description:** The major purpose of this course is for students to learn about gender issues within the field of counseling psychology from a multicultural and feminist perspective and to gain the essential knowledge and techniques in working with gender issues in diverse settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 969 Nonparametric Statistical Methods****Prerequisites:** EDPS 859**Description:** Presentation of statistical procedures that do not require fundamental assumptions about the distribution property of the variables to be analyzed. Chi Square tests, rank tests of location (Wilcoxon, Mann Whitney, Kruskal-Wallis, Friedman), tests of goodness of fit (Chi Square, Kolmogorov-Smirnoff), tests of randomness (Runs).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 970 Theory and Methods of Educational Measurement****Crosslisted with:** SRAM 970**Prerequisites:** EDPS 870**Description:** Presentation of various measurement theories and concepts, including classical true-score theory, reliability and validity, test construction, item response theory, test equating, test bias, and criterion-referenced tests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 971 Structural Equation Modeling****Crosslisted with:** SRAM 971**Notes:** EDPS 942 and EDPS 970 or equivalents required; EDPS 972 recommended.**Description:** Introduction to the techniques of path analysis, confirmatory factor analysis, and structural equation modeling with emphasis on the set-up and interpretation of different models using the LISREL program. Model testing and evaluation, goodness-of-fit indices, violations of assumptions, specification searches, and power analyses..**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 972 Multivariate Analysis****Crosslisted with:** SRAM 972**Notes:** EDPS 941 and EDPS 942 or equivalents are required.**Description:** Techniques of multivariate analyses, including multivariate analysis of variance and covariance, multivariate multiple regression, multigroup discriminant analysis, canonical analysis, repeated measures (Multivariate model), and time series. Mathematical models presented and analyzed. Instruction complemented by appropriate statistical software packages.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 980**EDPS 973A Evaluation Theory and Practice****Notes:** EDPS 859 and EDPS 870 or equivalents are required.**Description:** Theories and strategies of evaluation examined within the context of society at large and educational and human service programs in particular. Key evaluation models examined as they relate to judgments and decisions about programs. Methodological, social, and political issues in evaluation which pertain equally to an educational program or a human service agency.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 973B**EDPS 973B Evaluation Practicum****Prerequisites:** EDPS 973A**Description:** Actual supervised evaluation of a program or project.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 974 Guidance and Counseling in Schools****Description:** Survey of elementary, middle and secondary school comprehensive models of guidance. Ingredients of effective helping relationships with students in schools. Analysis of school violence, risk assessment models, multicultural influences, prevention models, and guidance roles of teachers/administrators.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 975 Occupations and Vocational Psychology****Description:** Evaluation and uses of occupational and educational information; job analysis; psychological and behavioral attributes relating to work and life-styles; occupational taxonomies; career-development theories; impact of accelerating changes on personal and social planning; investigations of value-oriented expectations as sources of work satisfaction and dissatisfaction; critical assessment of the concept of vocational choice. For counselors and educators.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**EDPS 976 Advanced Counseling Psychology I: Counseling Theory and Practice****Prerequisites:** EDPS Doctoral Student**Description:** Counseling methodology in relationship to personality theory and research. Consideration of various theories and research in relation to counseling practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

EDPS 977 Seminar in College Student Development

Crosslisted with: EDAD 980

Description: Current knowledge, theories, and practices, and related issues in the area of college student development.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

EDPS 978 Advanced Counseling Psychology II: Research in Counseling

Prerequisites: EDPS Doctoral Student

Description: Research strategies appropriate for counseling psychology. Identification of researchable problem and completion of research proposal including literature review, design, and proposed data analysis procedures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 979 Introduction to Student Affairs

Description: Current professional issues related to the organization and administration of student personnel within higher education. Exploration of research literature, some field experiences, and in-depth examination of special topics.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

EDPS 980 Item Response Theory

Prerequisites: EDPS 870 and EDPS 972; or permission of instructor.

Description: Principles of item response theory (IRT) and its application to a variety of issues in educational and psychological measurement. Theoretical foundations of IRT discussed along with its assumptions and varied applications. Experience using IRT calibration and scoring computer software.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 981 School Practice in School Psychology

Prerequisites: Permission of instructor

Description: Supervised practice in local school districts related to academic, social, behavioral and emotional disorders of children and adolescents.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 8

Format: LEC

EDPS 982 Clinical Practice in School Psychology

Prerequisites: Permission of instructor.

Description: Supervised clinical practice related to academic, social, behavioral and emotional disorders of children and adolescents. Parent and family treatment and behavior interventions emphasized.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 16

Format: LEC

Offered: FALL/SPR

EDPS 983 Community Practice in School Psychology

Prerequisites: Permission of instructor.

Description: Supervised clinical experience working with children, adolescents and families in a variety of school and community settings.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 16

Format: FLD

EDPS 984 Ethics and Ethical Decision Making in Counseling and Education

Prerequisites: EDPS Graduate Student

Description: Ethical principles in the practice of counseling. Application of ethical guidelines and development of ethical decision-making models relevant to school and mental health contents.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 985 Couple and Family Counseling

Prerequisites: EDPS Graduate Student

Description: Couple and family systems and change strategies. Active, brief forms of couple and family counseling and enrichment formats.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 987 Developmental Perspectives on Gender and Sexuality in Counseling

Description: Issues related to gender and sexuality in the process of counseling and psychotherapy. Developmental issues related to gender differences, gender bias, gender identity, gender discrimination, and gender-based disorders. Feminist and affirmative therapy techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EDPS 988 Lifespan Development

Description: Examine developmental change across the lifespan. Major theories and current research in the field of lifespan development as they inform physical, personality, psychological, cognitive, moral, and social development. Examine some major debates in developmental psychology (e.g. nature vs. nurture, quantitative vs. qualitative change). Provide an overview of life-span developmental changes and impacts on developmental change across the lifespan. Explore and critique theories explaining lifespan development of social, cognitive, and physical capacities. Develop a working understanding of the methods used in developmental research designed for professional school, counseling, or clinical psychologist with focused and in-depth awareness and empathy for the issues of development.

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Format: LEC

EDPS 989 Psychology of Reading and Writing

Crosslisted with: TEAC 989

Notes: This course combines two earlier courses, Psychology of Reading, EDPS 989 (cross listed with TEAC 989) and Seminar in Educational Psychology (Psychology of Writing, EDPS, 991) Prior graduate coursework in literacy or cognitive psychology recommended.

Description: Study of the research literature on cognitive and motivational processes involved in reading and writing. Readings and classroom discussion will focus on theories and models of reading and writing. Specific topics include the roles of component processes of literacy such as attention, perception, memory, and problem solving, as well as studies of self-regulatory and social influences on literacy development and performance. Literacy research and models are examined at all levels of reading and writing, from early acquisition through high-level reading and writing expertise, as well as with respect to changes in literacy activities tied to new technologies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

EDPS 991 Seminar in Educational Psychology and Measurements

Prerequisites: Permission of instructor.

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

EDPS 993 Workshop Seminar

Prerequisites: Permission of instructor

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

EDPS 995 Doctoral Seminar

Prerequisites: Permission of instructor.

Notes: EDPS 995 is intended primarily for EDPS doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor. Students are immersed in outcome-based scholarly activities with a faculty mentor.

Description: Working on either an individualized or small group basis, students develop, execute and report one or more projects addressing the interaction between research and practice.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 18

Format: IND

EDPS 996A Research Other Than Thesis

Prerequisites: Permission of instructor.

Description: Independent operational research under faculty supervision.

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: IND

EDPS 996B Readings in Educational Psychology

Prerequisites: Permission of instructor.

Description: Readings on selected problems in educational psychology.

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: IND

EDPS 997A Practicum in Counseling

Prerequisites: EDPS 866

Notes: Parallel: EDPS 964.

Description: Supervised laboratory clinic-based experiences in counseling.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDPS 997B Field Placement in Counseling

Prerequisites: EDPS Graduate Student

Description: Supervised field experiences in school counseling, college student personnel, and community social service agencies.

Credit Hours: 2-4

Min credits per semester: 2

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

EDPS 997E Practicum in Counselor Supervision and Consultation

Prerequisites: EDPS 997G

Description: Supervised counseling supervision and consultation experience emphasizing process methods and evaluation.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 4

Format: LEC

EDPS 997G Advanced Practicum in Counseling**Prerequisites:** EDPS Doctoral Student**Description:** Supervised counseling experience in university, schools, and community agencies.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** EDPS 997E**EDPS 997J Advanced Practicum in Gifted Education****Crosslisted with:** SPED 997J**Prerequisites:** Permission of instructor.**Description:** Advanced practicum in the education of the gifted/talented child. Psychodiagnostic procedures; theory and research; and program organization, operation, and evaluation in a field setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**EDPS 997K Supervision in School Psychology****Prerequisites:** Permission of instructor.**Description:** Supervised experience in supervising graduate students in practicum settings. Refinement of consultation, assessment, diagnosis, and treatment skills.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 8**Format:** LEC**Offered:** FALL/SPR**EDPS 999 Doctoral Dissertation****Prerequisites:** Permission of instructor.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Electrical and Computer Engineering (ECEN)

ECEN 800 Electronic Instrumentation**Crosslisted with:** ECEN 400**Prerequisites:** Senior standing in engineering.**Description:** Applications of analog and digital devices to electronic instrumentation. Includes transducers, instrumentation amplifiers, mechanical and solid-state switches, data acquisition systems, phase-lock loops, and modulation techniques. Demonstrations with working circuits and systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 806 Power Systems Analysis****Crosslisted with:** ECEN 406**Prerequisites:** ECEN 338/(UNO) ECEN 3380 or ECEN 838/(UNO) ECEN 8386.**Description:** Symmetrical components and fault calculations, power system stability, generator modeling (circuit view point), voltage control system, high voltage DC transmission, and system protection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 957**ECEN 807 Power Systems Planning****Crosslisted with:** ECEN 407**Prerequisites:** ECEN 305/(UNO) ECEN 3050.**Description:** Economic evaluation, load forecasting, generation planning, transmission planning, production simulation, power plant reliability characteristics, and generation system reliability.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 808 Engineering Electromagnetics****Crosslisted with:** ECEN 408**Prerequisites:** ECEN 306/(UNO) ECEN 3060.**Notes:** Laboratory experiments.**Description:** Applied electromagnetics: Transmission lines in digital electronics and communication. The quasistatic electric and magnetic fields: electric and magnetic circuits and electromechanical energy conversion. Guided waves: rectangular and cylindrical metallic waveguides and optical fibers. Radiation and antennas: line and aperture antennas and arrays.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 810 Multivariate Random Processes****Crosslisted with:** ECEN 410**Prerequisites:** ECEN 305/(UNO) ECEN 3050.**Description:** Probability space, random vectors, multivariate distributions, moment generating functions, conditional expectations, discrete and continuous-time random processes, random process characterization and representation, linear systems with random inputs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 911; ECEN 912; ECEN 915; ECEN 946**ECEN 815 Digital Image Processing****Prerequisites:** ECEN 424/824 (UNO ECEN 4240/8240)**Description:** Topics covering the spatial and spectral analysis of digital image processing systems, the design of multi-dimensional digital filters and systems, and advanced theories and technologies in digital image processing systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ECEN 816 Materials and Devices for Computer Memory, Logic, and Display**Crosslisted with:** ECEN 416**Prerequisites:** PHYS 212/(UNO) PHYS 2120.**Description:** Survey of fundamentals and applications of devices used for memory, logic, and display. Magnetic, superconductive, semiconductive, and dielectric materials.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 817 Semiconductor Fundamentals II****Crosslisted with:** ECEN 417**Prerequisites:** ECEN 421/(UNO) ECEN 4210 or ECEN 821/(UNO) ECEN 8216.**Description:** Analysis of BJT's and MOSFET's from a first principle materials viewpoint. Static and dynamic analysis and characterization. Device fabrication processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 820 Plasma Processing of Semiconductors****Crosslisted with:** ECEN 420**Prerequisites:** Senior or graduate standing.**Description:** Physics of plasmas and gas discharges developed. Includes basic collisional theory, the Boltzman equation and the concept of electron energy distributions. Results are related to specific gas discharge systems used in semiconductor processing, such as sputtering, etching, and deposition systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 821 Principles of Semiconductor Materials and Devices I****Crosslisted with:** ECEN 421**Prerequisites:** PHYS 213/(UNO) PHYS 2130.**Description:** Introduction to semiconductor fundamentals, charge carrier concentration and carrier transport, energy bands, and recombination. PN junctions, static and dynamic, and special PN junction diode devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 822 Introduction to Physics and Chemistry of Solids****Crosslisted with:** PHYS 422, PHYS 822, ECEN 422**Prerequisites:** PHYS 213 or CHEM 481/881, MATH 221/821.**Description:** Introduction to structural, thermal, electrical, and magnetic properties of solids, based on concepts of atomic structure, chemical bonding in molecules, and electron states in solids. Principles underlying molecular design of materials and solid-state devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 824 Digital Signal Processing****Crosslisted with:** ECEN 424**Prerequisites:** ECEN 355 or (UNO) ECEN 3550.**Description:** The temporal and spectral analysis of digital signals and systems, the design of digital filters and systems, and advanced systems including multi-rate digital signal processing techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 815; ECEN 926**ECEN 828 Power Electronics****Crosslisted with:** ECEN 428**Prerequisites:** ECEN 304/(UNO) ECEN 3040 and ECEN 316/(UNO) ECEN 3160.**Description:** Basic analysis and design of solid-state power electronic devices and converter circuitry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 932**ECEN 830 Wind Energy****Crosslisted with:** ECEN 430**Prerequisites:** Senior standing.**Description:** Engineering principles of both the mechanical/aero dynamical and electrical components and systems, along with economic and environmental considerations for citing and public policy, to appropriately cover the relevant topics associated with all scales of wind energy implementations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 833 Microprocessor System Design****Crosslisted with:** ECEN 433**Prerequisites:** ECEN 310 or (UNO) ECEN 3100 with a grade of "C" or better; ECEN 332 or (UNO) ECEN 3320 with a grade of "C" or better.**Description:** Microprocessor based systems: architecture; design; and interfacing. Hardware topics: memory design; input/output ports; serial communications; and interrupts. Software topics: generating assembly ROM code; assembly/C firmware generation; and designing device drivers.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ECEN 435, ECEN 835

ECEN 835 Embedded Microcontroller Design**Crosslisted with:** ECEN 435**Prerequisites:** ECEN 433/833 or (UNO) ECEN 4330/8336 with a grade of "C" or better; STAT/MATH 380 or (UNO) STAT 3800.**Description:** Microcontroller architecture: design, programming, and interfacing for embedded systems. Timing issues, memory interfaces, serial and parallel interfacing, and functions for common microcontrollers.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ECEN 437, ECEN 837; ECEN 496**ECEN 836 Electric Machines****Crosslisted with:** ECEN 436**Prerequisites:** PHYS 212/(UNO) PHYS 2120 and ECEN 216/(UNO) ECEN 2160.**Description:** Provides a solid background in electric machine analysis, covering fundamental concepts, techniques, and methods for analysis and design. Discussion of transformers and presentation of some new systems and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 932**ECEN 837 Parallel and Distributed Processing****Crosslisted with:** ECEN 437**Prerequisites:** ECEN 435/835 or (UNO) ECEN 4350/8366.**Description:** Parallel and distributed processing concepts, principles, techniques, and machines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 838 Integrated Systems Programming****Crosslisted with:** ECEN 438**Prerequisites:** ECEN 310 or (UNO) ECEN 3100 and ECEN 332 or (UNO) ECEN 3320**Description:** Introduction to the basics of computer architectural details under the context of computer system programming. Topics include representing and manipulating information, machine level representation of programs, processor architecture and pipelining, compiling and linking, optimizing program performance from the system level, memory hierarchy, dynamic memory allocation and exceptional control flow. Linux system programming tool chain will also be introduced.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**ECEN 842 Basic Analytical Techniques in Electrical Engineering****Crosslisted with:** ECEN 442**Prerequisites:** MATH 221/(UNO) MATH 2350.**Description:** Applications of partial differential equations, matrices, vector analysis, complex variables, and infinite series to problems in electrical engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 844 Linear Control Systems****Crosslisted with:** ECEN 444**Prerequisites:** ECEN 304/(UNO) ECEN 3040.**Description:** Classical (transfer function) and modern (state variable) control techniques. Both time domain and frequency domain techniques are studied. Traditional proportional, lead, lag, and PID compensators are examined, as well as state variable feedback.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 848 Decision Analysis****Crosslisted with:** ECEN 448**Prerequisites:** ECEN 305/(UNO) ECEN 3050 or STAT 380/(UNO) STAT 3800.**Description:** Principles of engineering economy including time value of money, net present value and internal rate of return. Use of influence diagram and decision tree to structure and analyze decision situations under uncertainty including use of stochastic dominance, value of information, and utility theory. Fundamentals of two-person matrix games including Nash equilibrium.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 850 Bioinformatics****Crosslisted with:** ECEN 450**Prerequisites:** Computer programming language and ECEN 305/(UNO) ECEN 3050 or IMSE 321 or STAT 380/(UNO) STAT 3800 or equivalent.**Description:** Examination of how information is organized in biological sequences such as DNA and proteins and computational techniques which make use of this structure. Various biochemical processes that involve these sequences are studied to understand how these processes affect the structure of these sequences. In the process bioinformatics algorithms, tools, and techniques which are used to explore genomic and amino acid sequences are also introduced.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 851 Introduction to VLSI System Design****Crosslisted with:** ECEN 451**Prerequisites:** ECEN 310 or (UNO) ECEN 3100.**Description:** The concepts, principles, and methodology at all levels of digital VLSI system design and focused on gate-level VLSI implementation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ECEN 852 Introduction to Computer-Aided Digital Design**Crosslisted with:** ECEN 452**Prerequisites:** ECEN 310 or (UNO) ECEN 3100.**Description:** The concepts, simulation techniques and methodology in computer-aided digital design at system and logic levels.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 854 Power Systems Operation and Control****Crosslisted with:** ECEN 454**Prerequisites:** ECEN 338/(UNO) ECEN 3380.**Description:** Characteristics and generating units. Control of generation, economic dispatch, transmission losses, unit commitment, generation with limited supply, hydrothermal coordination, and interchange evaluation and power pool.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 860 Labview Programming****Crosslisted with:** ECEN 460**Prerequisites:** Prior programming experience**Description:** Labview as a programming language and for applications to acquire and analyze data, to access the network, control lab instruments, and for video and sound applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 861 Digital Communications Media****Crosslisted with:** ECEN 461**Prerequisites:** ECEN 325 or (UNO) 3250 or ECEN 462 or (UNO) ECEN 4620**Description:** Topics related to the transport of bit streams from one geographical location to another over various physical media such as wire pairs, coaxial cable, optical fiber, and radio waves. Transmission characteristics, media interfacing, delay, distortion, noise, and error detection and correction techniques.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ECEN 479, ECEN 879; ECEN 885; ECEN 977**ECEN 862 Communication Systems****Crosslisted with:** ECEN 462**Prerequisites:** ECEN 304/(UNO) ECEN 3040 and ECEN 305/(UNO) ECEN 3050.**Description:** Mathematical descriptions of signals in communication systems. Principles of analog modulation and demodulation. Performance analysis of analog communication systems in the presence of noise.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 911**ECEN 863 Digital Signal Processing****Crosslisted with:** ECEN 463**Prerequisites:** ECEN 304/(UNO) ECEN 3040.**Description:** Discrete system analysis using Z-transforms. Analysis and design of digital filters. Discrete Fourier transforms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 915**ECEN 864 Digital Communication Systems****Crosslisted with:** ECEN 464**Description:** Principals of digital transmission of information in the presence of noise. Design and analysis of baseband PAM transmission systems and various carrier systems including ASK, FSK, PSK.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 911; ECEN 912; ECEN 959**ECEN 865 Introduction to Data Compression****Crosslisted with:** ECEN 465**Prerequisites:** ECEN 305/(UNO) ECEN 3050.**Description:** Introduction to the concepts of Information Theory and Redundancy removal. Simulation of various data compression schemes such as Delta Modulation, Differential Pulse Code Modulation, Transform Coding and Runlength Coding.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 866 Telecommunications Engineering I****Crosslisted with:** ECEN 466**Prerequisites:** ECEN 362 or (UNO) ECEN 3620; ECEN 461/861 or (UNO) ECEN 4610/8610, or parallel.**Description:** Standard telecommunications protocols, architecture of long distance integrated data networks, local area networks, wide area networks, radio and satellite networks. Network management, internetworking, system modeling and performance analysis.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** ECEN 496**ECEN 867 Electromagnetic Theory and Applications****Crosslisted with:** ECEN 467**Prerequisites:** ECEN 306/(UNO) ECEN 3060.**Description:** Engineering application of Maxwell's equations. Fundamental Parameters of Antennas. Radiation, analysis, and synthesis of antenna arrays. Aperture Antennas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 965

ECEN 868 Microwave Engineering**Crosslisted with:** ECEN 468**Prerequisites:** ECEN 306/(UNO) ECEN 3060.**Description:** Applications of active and passive devices to microwave systems. Includes impedance matching, resonators, and microwave antennas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 965**ECEN 869 Analog Integrated Circuits****Crosslisted with:** ECEN 469**Prerequisites:** ECEN 361/(UNO) ECEN 3610.**Description:** Analysis and design of analog integrated circuits both bipolar and MOS. Basic circuit elements such as differential pairs, current sources, active loads, output drivers used in the design of more complex analog integrated circuits.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 913**ECEN 870 Digital and Analog VLSI Design****Crosslisted with:** ECEN 470**Prerequisites:** ECEN 316/(UNO) ECEN 3160.**Description:** Introduction to VLSI design techniques for analog and digital circuits. Fabrication technology and device modelling. Design rules for integrated circuit layout. LSI design options with emphasis on the standard cell approach of digital and analog circuits. Lab experiments, computer simulation and layout exercises.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 871 Computer Communication Networks****Crosslisted with:** ECEN 471**Prerequisites:** ECEN 325 or (UNO) ECEN 3250.**Description:** High-speed access control protocols, routing protocols, traffic management, and network topologies. Giga-bit Ethernet, ATM, and TCP/IP. Performance modeling and simulation techniques.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 873 Mobile and Personal Communications****Crosslisted with:** ECEN 473**Prerequisites:** ECEN 325 or (UNO) ECEN 3250.**Description:** Concepts on mobile and personal communications. Modulation techniques for mobile radio, equalization, diversity, channel coding, and speech coding.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 874 Digital Systems****Crosslisted with:** ECEN 474**Prerequisites:** ECEN 370/(UNO) ECEN 3700.**Description:** Synthesis using state machines; design of digital systems; micro programming in small controller design; hardware description language for design and timing analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 477, ECEN 877**ECEN 875 Satellite Communications****Crosslisted with:** ECEN 475**Prerequisites:** ECEN 325 OR (UNO) ECEN 3250.**Description:** The fundamental concepts of satellite communications. Orbits, launching satellites, modulation and multiplexing, multiple access, earth stations, coding, interference and special problems in satellite communications.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 876 Wireless Communications****Crosslisted with:** ECEN 476**Prerequisites:** ECEN 325 or ECEN 462 or parallel**Description:** The fundamental concepts of wireless communications. Basic communications concepts such as multiple access and spectrum. Propagation, radio standards and internet working. Current issues in wireless communications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 926; ECEN 977**ECEN 877 Digital Systems Organization and Design****Crosslisted with:** ECEN 477**Prerequisites:** ECEN 474/(UNO) ECEN 4740 or ECEN 874/(UNO) ECEN 8746**Description:** Hardware development languages, hardware organization and realization, microprogramming, interrupt, intersystem communication, and peripheral interfacing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 879 Optical Fiber Communications****Crosslisted with:** ECEN 479**Prerequisites:** ECEN 461/861 or (UNO) ECEN 4610/8616**Description:** Fundamentals of lightwave communication in optical fiber waveguides, physical description of fiber optic systems. Properties of the optical fiber and fiber components. Electro-optic devices: light sources and modulators, detectors and amplifiers; optical transmitter and receiver systems. Fiber optic link design and specification; fiber optic networks.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** ECEN 979

ECEN 880 Introduction to Lasers and Laser Applications**Crosslisted with:** ECEN 480, PHYS 480, PHYS 880**Prerequisites:** PHYS 213/(UNO) PHYS 2130.**Description:** Physics of electronic transition production stimulated emission of radiation. Threshold conditions for laser oscillation. Types of lasers and their applications in engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 882 Antennas and Radio Propagation for Wireless Communications****Crosslisted with:** ECEN 482**Prerequisites:** ECEN 328 or (UNO) ECEN 3280.**Description:** Fundamental theory of antennas and radio propagation for wireless communications. Basic antenna characteristics and various antennas and antenna arrays. Basic propagation mechanisms and various channel models, such as Friis free space model, Hata model, lognormal distribution, and multipath model. Includes practical antenna design for high radio frequency (RF) with modeling software tools such as Numerical Electromagnetic Code (NEC) and Advanced Design System (ADS). Design projects will be assigned as the main part of course.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 883 Random Processes in Engineering****Prerequisites:** STAT 380 (UNO STAT 3800)**Description:** Topics related to the concept of random variables, functions of random variables and random processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 926**ECEN 884 Network Security****Crosslisted with:** ECEN 484**Prerequisites:** ECEN 325 or (UNO) ECEN 3250.**Description:** Network security and cryptographic protocols. Classical encryption techniques, block ciphers and stream cyphers, public-key cryptography, authentications digital signatures, key management and distributions, network vulnerabilities, transport-level security, IP security.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 885 Spread Spectrum Communications****Prerequisites:** ECEN 461/861 (UNO ECEN 4610/8616)**Description:** Introduction to the theory of spread spectrum communications: direct sequence, frequency and time hopping techniques. Topics include properties of pseudo-random binary sequences, low-probability-of-intercept (LPI) and anti-jamming (AJ) methods, performance of spread spectrum systems, applications of spread spectrum techniques in radio frequency and optical code-division multiple access (CDMA) systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ECEN 886 Applied Photonics****Crosslisted with:** ECEN 486**Prerequisites:** ECEN 306/(UNO) ECEN 3060 or permission.**Description:** Introduction to the use of electromagnetic radiation for performing optical measurements in engineering applications. Basic electromagnetic theory and light interaction with matter are covered with corresponding laboratory experiments conducted.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECEN 986**ECEN 888 Wireless Security****Crosslisted with:** ECEN 488**Prerequisites:** ECEN 325 or (UNO) ECEN 3250.**Description:** A comprehensive overview on the recent advances in wireless network and system security. Covers security issues and solutions in emerging wireless access networks and systems as well as multihop wireless networks.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 891 Special Topics in Electrical and Computer Engineering IV****Crosslisted with:** ECEN 491**Prerequisites:** Senior standing.**Description:** Special topics in the emerging areas of electrical, computer, and electronics engineering which may not be covered in other courses in the electrical and computer engineering curriculum.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ECEN 892 Individual Study in Electrical and Computer Engineering IV****Crosslisted with:** ECEN 492**Prerequisites:** Senior standing.**Notes:** Requires a ECE departmentally approved proposal.**Description:** Individual study in a selected electrical, computer, or electronics engineering area under the supervision and guidance of an electrical and computer engineering faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**ECEN 893 Independent Study in Computer and Electronics Engineering****Prerequisites:** Departmentally approved proposal.**Description:** Individual study at the graduate level in a selected electrical or computer engineering area under the supervision and guidance of an Electrical & Computer Engineering faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND

ECEN 895 Special Topics

Description: Special topics in the newly emerging areas of computer and electronics engineering not covered in the other courses in the electrical and computer engineering curriculum.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 898 Special Topics in Electrical Engineering IV

Crosslisted with: ECEN 498

Prerequisites: Permission

Notes: Offered as the need arises for electrical engineering topics for fourth-year and graduate students not covered in other courses.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

ECEN 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser.

Description: Masters thesis work.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

ECEN 911 Communication Theory

Prerequisites: ECEN 862/(UNO) ECEN 8626, and ECEN 864/(UNO) ECEN 8646 or ECEN 810/(UNO) ECEN 8106

Description: Applications of probability and statistics to signals and noise; correlation; sampling; shot noise; spectral analysis; Gaussian processes; filtering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 912 Error Control Coding

Prerequisites: ECEN 410/(UNO) ECEN 4100 or ECEN 810/(UNO) ECEN 8106; and ECEN 464/(UNO) ECEN 4640 or ECEN 864/(UNO) ECEN 8646; or permission.

Description: Fundamentals of error correction and detection in digital communication and storage systems. Linear and algebraic block codes; Hamming, BCH and Reed-Solomon codes; algebraic decoding techniques; structure and performance of convolutional codes, turbo codes, and trellis coded modulation; MAP, Viterbi, and sequential decoding techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 913 Advanced Analog and Mixed-Signal Integrated Circuits

Prerequisites: ECEN 869/(UNO) ECEN 8696 and permission

Description: Advanced current mirrors and op-amps. Comparators and sample/hold (S/H) circuits. Band-gap reference circuits. Trans-linear circuits and analog multipliers. Voltage controlled oscillators. Operational trans-conductance amplifiers (OTA's). Switched capacitor circuits. Data converters. Non-linearity, mismatch, and short-channel effects. Continuous time domain integrated filters. Current conveyors. Phase locked loops. Analog CAD.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 915 Adaptive Signal Processing

Prerequisites: ECEN 410/(UNO) ECEN 4100 or ECEN 810/(UNO) ECEN 8106; and ECEN 463/(UNO) ECEN 4630 or ECEN 863/(UNO) 8636; and permission

Description: Adaptive filtering algorithms, frequency and transform domain adaptive filters, and simulation and critical evaluation of adaptive signal processing for real world applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 926 Statistical Signal Processing for Wireless Communications

Prerequisites: ECEN 424/824/(UNO) ECEN 4240/8246; ECEN 476/876/(UNO) ECEN 4760/8760; and ECEN 883/(UNO) ECEN 8830

Description: Statistical signal processing and applications for wireless communications: the characteristics of random signals; optimum linear filters; statistical parameter estimation using maximum likelihood (ML) and minimum mean-square error (MMSE) methods; adaptive signal processing using least-mean-square (LMS) and recursive least-square (RLS) approaches; Kalman filtering; and eigenanalysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 932 Advanced Power Electronics and Applications

Prerequisites: ECEN 428/(UNO) ECEN 4280 or ECEN 828/(UNO) ECEN 8286; and ECEN 426/(UNO) ECEN 4260 or ECEN 836/(UNO) ECEN 8366.

Description: Analysis and design of power electronic circuits and their applications, including: snubber circuits, resonant converters and soft switching techniques, pulse-width modulation techniques, control of power electronic circuits, power electronics and control for electric machines and wind energy systems, flexible AC-transmission system (FACTS) devices, and high-voltage DC (HVDC) transmission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 935 Computational Intelligence

Prerequisites: MATH 208/(UNO) MATH 1970, MATH 221/(UNO) MATH 2350, MATH 314/(UNO) MATH 2050, and good skills using MATLAB

Description: Computational intelligence paradigms and their applications, including: artificial neural networks, fuzzy logic systems, swarm intelligence, evolutionary computation (e.g., genetic algorithms), machine learning (e.g., supervised learning, unsupervised learning, and reinforcement learning), neurocontrol and adaptive critic designs, and applications of computational intelligence for system identification, state estimation, time series prediction, signal processing, adaptive control, optimization, diagnostics, prognostics, etc.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 946 Optimal Filtering, Estimation and Prediction

Prerequisites: ECEN 810/(UNO) ECEN 8106

Description: Techniques for optimally extracting information about the past, present, or future status of a dynamic system from noise-corrupted measurements on that system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 957 Advanced Computer Methods in Power System Analysis

Prerequisites: ECEN 806/(UNO) ECEN 8066

Description: Power system matrices, sparsity techniques, network equivalents, contingency analysis, power flow optimization, state estimation, and power system restructuring examined via computer methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 959 Wireless Communications

Prerequisites: ECEN 864/(UNO) ECEN 8646 and permission

Description: Principles of wireless communications, including: description of the wireless channel characteristics; ultimate performance limits of wireless systems; performance analysis of digital modulation techniques over wireless channels; diversity techniques; adaptive modulation; multiple-antenna communications; multi-carrier modulation; and multi-user wireless communications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 960 Solid-State Devices

Prerequisites: ECEN 315/(UNO) ECEN 3150 or equivalent

Description: Gallium arsenide and silicon devices. Device properties based on structure and physical properties of the materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 965 Passive Microwave Components

Prerequisites: ECEN 867/(UNO) ECEN 8676 or ECEN 868/(UNO) ECEN 8686

Description: Application of Maxwell's Equations to the analysis of waveguides, resonant cavities, filters and other passive microwave devices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 967 Introduction to Quantum Electronics

Description: Introduction to the quantum aspects of electron devices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ECEN 968; ECEN 975

ECEN 968 Electron Theory of Solids I

Prerequisites: ECEN 967/(UNO) ECEN 9670

Description: Quantitative development of the fundamentals of the quantum-mechanical theory of electrons in solids.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 971 Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

ECEN 973 Introduction to Nanotechnology

Notes: The content of the course will be updated annually based on new scientific findings.

Description: Topics in nanotechnology as defined by the National nanotechnology Initiative, with emphasis on topics related to electrical engineering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 975 Optical Properties of Materials

Prerequisites: ECEN 967/(UNO) ECEN 9670 or equivalent

Description: Quantum mechanical description of the optical properties of solids (complex refractive index and its dispersion, effects of electric and magnetic fields, temperature, stress; additional special topics as desired).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 977 Space-time Wireless Communications

Prerequisites: ECEN 461/861/(UNO) ECEN 4630/8636; ECEN 476/876/(UNO) ECEN 4760/8766

Description: Theory of space-time (ST) wireless communication systems. Spatial diversity, smart antenna systems, MIMO capacity of multi-antenna fading channels, space-time signaling, space-time receivers, and interference mitigation. Overview of more advanced topics such as MIMO-OFDM. Current trends in research and in the industry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 979 Non-Linear Fiber Optic Systems

Prerequisites: ECEN 479/879 (UNO ECEN 4790/8796)

Description: Linear and non-linear propagations in optical fibers. Topics include fiber non-linearity, fundamentals of optical amplifiers, semiconductor and fiber amplifiers, soliton communications. Applications include high capacity and long distance transmissions, all-optical networks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 986 Optoelectronics

Prerequisites: ECEN 886/(UNO) ECEN 8866

Description: Modern phenomena associated with optoelectronics. Electro-optical effect such as Pockel effect, Kerr effect, and nonlinear optical phenomena. Material and devices used in modern communications, femtosecond lasers, and optical computer systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 991 Independent Study

Prerequisites: Permission

Description: Selected topic under the direction and guidance of a faculty member.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

ECEN 992 Research Other Than Thesis

Prerequisites: Permission and graduate standing.

Description: Supervised non-thesis research and independent study.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

ECEN 996 Topics in Electrical Engineering

Prerequisites: Permission

Description: Selected topics in electrical engineering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

ECEN 998 Advanced Special Topics

Prerequisites: Permission

Description: Advanced topics in computer and electronics engineering.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ECEN 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair.

Description: Dissertation research.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Engineering (ENGR)

ENGR 805 Analysis of Engineering Management

Prerequisites: CONE 206 or BSEN 206

Description: General concepts and principles of engineering management applied to cases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 806 Decision and Risk Analysis

Prerequisites: BSEN 206; MECH 321 or STAT 380/MATH 380/STAT 880.

Description: Theory and practice of decision making under uncertainty. Graphical modeling techniques including influence diagram and decision trees. The value of information. Utility theory foundations, risk preference, and multi-attribute decision modes. Economic justification of projects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 807 Project Management

Description: Project development, role of the project manager, project selection, project planning, budgeting and cost estimation, project scheduling, and project termination.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 810 Ergonomics

Notes: Not open to students with credit in IMSE 315.

Description: Introduction to the principles of ergonomics. Information processing, human output and control, workplace design and environmental conditions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 812 Occupational Safety-A Systems Analysis**Prerequisites:** MECH 321**Description:** Analysis of safety performance, attribution of cost, identification and analysis of accident potential. Fault Tree analysis. Systems safety and reliability.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 815 Cognitive Ergonomics****Prerequisites:** ENGR 830 or permission**Description:** Human factors affecting work. Focus on humans: energy requirements, lighting, noise, monotony and fatigue, learning, simultaneous versus sequential tasks. Experimental evaluation of concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ENGR 919**ENGR 816 Physical Ergonomics****Prerequisites:** ENGR 830 or permission**Description:** Human performance in work. Human response to various environmental and task-related variables with emphasis on physical and physiological effects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ENGR 919**ENGR 817 Occupational Safety Hygiene Engineering****Prerequisites:** Senior standing.**Description:** Introduction to occupational hygiene engineering with emphasis on workplace environmental quality. Heat, illumination, noise, and ventilation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 823 Reliability Engineering****Description:** System and component reliability analyses of series, parallel and complex systems. Concepts of reliability, availability, and maintainability in design of systems. Methods of reliability testing and estimation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 830 Applied Statistics and Quality Control****Prerequisites:** MECH 321**Description:** Systematic analysis of processes through the use of statistical analysis, methods, and procedures; statistical process control, sampling, regression, ANOVA, quality control, and design of experiments. Use of software for performing a statistical analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ENGR 815; ENGR 816**ENGR 831 Stochastic Processes****Description:** Fundamentals of stochastic processes and their application in modeling production/inventory control, maintenance and manufacturing systems. Markov and semi-Markov chains, Poisson processes, renewal processes, regenerative processes and Markov decision processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 832 Scheduling****Description:** The problem of scheduling several tasks over time, including measure of performance, single-machine sequencing, flow shop scheduling, the job shop problem and priority dispatching.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 840 Discrete Event Simulation Modeling****Prerequisites:** CONE/BSEN 206 and MECH 321; CSCE 155A, CSCE 155E, CSCE 155H, CSCE 155N or CSCE 155T.**Description:** Development of simulation models of discrete systems. Model development, Monte Carlo techniques, random number generators, and output analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 860 Packaging Engineering****Prerequisites:** CONE/BSEN 206, MECH 321, MECH 373.**Description:** Investigation of packaging processes, materials, equipment and design. Container design, material handling, storage, packaging and environmental regulations, and material selection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 861 Radio Frequency Identification****Description:** Fundamentals of how radio frequency identification (RFID) components of tag, transponder, and antennae are utilized to create RFID systems. Best practices for implementation of RFID systems in common supply chain operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGR 869 Technology, Science and Civilization****Description:** Development of technology as a trigger of change upon humankind, from the earliest tools of Homo Habilis to the advent of the radio telescope in exploring the creation of the universe. Traces the paths from early science to development of the sciences and technologies that will dominate the new millennium.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENGR 881 Supply Chain Optimization

Description: Concepts of the economic and service trade-offs in supply chain and logistics management. Using decision support system (DSS) to design optimal logistics network model with given requirements and operational parameters using leading software packages to model problems arising in strategic management of logistics networks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 882 Material Planning in Logistic Systems

Prerequisites: MECH 321 and IMSE 328.

Description: Theory, practice and application of inventory, demand and supply planning techniques in multistage environments. Managing economies of scale, uncertainties, capacity constraints, and product availability in a supply chain. Integrated planning, supply chain coordination and technology enablers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 883 Logistics in the Supply Chain

Description: The process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption. Domestic transportation systems, distribution centers and warehousing, international logistics, logistics system controls, and reengineering logistics systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 891 Special Topics in Engineering Management

Description: Subject matter in emerging areas of engineering management and closely related areas not covered in other courses within the MEM curriculum. Topics, activities, and delivery methods vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

ENGR 901 Total Quality Management Using Six Sigma Techniques

Description: Introduction to advanced topics in Engineering Management and the foundations of Total Quality Management (TQM). Costs of quality, statistical tools, initiating change, advanced topics, and TQM in practice. Using DMAIC, DFSS, and COPQ along with the other industry-accepted Six Sigma Quality Techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 905 Analysis of Engineering Management II

Description: Continuation of concepts and principles of engineering management applied to production cases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 906 Financial Engineering

Prerequisites: IMSE 806.

Description: Applications of principle and financial economics in industrial and systems engineering. Term structure of interest, capital asset pricing and other capital allocation models. Evaluation of real-options using binomial lattice, Black-Scholes and other pricing models.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGR 919 Determinants of Occupational Performance

Prerequisites: ENGR 815, 816 or permission

Description: Focus on the individual in the industrial working environment. Emphasis on evaluation of fatigue, training, shift work, perception, vigilance, and work-rest scheduling as they relate to the working environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Engler Agribusiness Entrepreneurship Program (EAEP)

EAEP 888 Business Management for Agricultural Enterprises

Crosslisted with: HORT 488, HORT 888, EAEP 488, AGRO 488, ENTR 488, AGRO 888, ENTR 888, ABUS 488

Description: Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. Requires the completion of a shadowing assignment and the analysis of case studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

EAEP 896 Independent Study in Entrepreneurship

Crosslisted with: EAEP 496

Prerequisites: Sophomore or higher standing plus permission from the instructor.

Notes: The proposed independent study is subject to approval of the Director of the Engler Agribusiness Entrepreneurship Program.

Description: Entrepreneurship can be approached from many angles and with significant diversity in both value proposition, market reach and concept to customer process. This offering provides the opportunity for students to investigate a particular topic or concept that is professionally relevant under the guidance of a faculty advisor(s) with appropriate expertise/skills/network. Requires individual or team project work focused on investigation of a topic relevant to developing entrepreneurial capacity.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

English (ENGL)

ENGL 801 Drama

Crosslisted with: ENGL 401

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Particular historical periods or other groupings of dramas. The relation of the writers both to one another and to the aesthetic and intellectual climate of their times. Examples: drama survey, modern drama, American drama, and Shakespeare's contemporaries in drama.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 801K LGBTQ Drama and Popular Culture

Crosslisted with: ENGL 401K, WMNS 401K, WMNS 801K

Prerequisites: Junior standing.

Description: Overview of lesbian, gay, bisexual, transgender, and queer drama and popular culture.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 802 Poetry

Crosslisted with: ENGL 402

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Epic, Renaissance, Romantic, Victorian, American, and contemporary poetry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 802L Romantic Poetry

Crosslisted with: ENGL 402L

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Survey of British poetry, 1780-1835. The traditional major authors and some of the many other poets whose works were popular and influential. The social, historical, and cultural context.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 803 American Short Story

Crosslisted with: ENGL 403

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: The narrative genre of the short story, as represented by stories from American authors of the nineteenth century to the present day.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 805 Fiction

Crosslisted with: ENGL 405

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Fiction, primarily novels, in particular historical periods or other groupings. The relation of the writers both to one another and to the aesthetic and intellectual climate of their time.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 805A 19th Century British Novel

Crosslisted with: ENGL 405A

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: The most popular and influential literary genre in the nineteenth century, the novel, through representative Romantic, Victorian, and "fin de siècle" (end of century) works.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 805B 18th Century British Novel

Crosslisted with: ENGL 405B

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Survey of British fiction (primarily novels), 1780-1850. Major and minor authors whose works illustrate the tastes and trends of British fiction in the early modern period. The literary, social, and cultural context.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 805E Modern Fiction**Crosslisted with:** ENGL 405E**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Key British and American novels and short stories from about 1910 to 1950. Modernism as a literary and cultural practice. Modernism's interpretation of the revolutionary changes in culture and society in the first half of the twentieth century. The relation between modernism and postmodernism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 805K Canadian Fiction****Crosslisted with:** ENGL 405K**Prerequisites:** Junior standing.**Description:** Survey of modern Canadian novels and short stories from 1920 to the present plus some other genres. The historical and cultural context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 805M American Novel I****Crosslisted with:** ENGL 405M**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Survey of novels written by a variety of men and women of diverse backgrounds in the United States from the late eighteenth century to 1900.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 805N American Novel II****Crosslisted with:** ENGL 405N**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Survey of novels written by a variety of men and women of diverse backgrounds in the United States from 1900 to the present day.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 806 Genre****Crosslisted with:** ENGL 406**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** History and theory of the concept of genre as exemplified in literary works in various forms: comedy, tragedy, and satire.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 810 Studies in Literary Movements****Crosslisted with:** ENGL 410**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** A literary movement (national or transnational), the development of a genre, or the intellectual and historical origins of an idea, as reflected in literature. May include the literature of abolition, alternative Romanticism, literary modernism, the literature of Civil Rights, postmodernism, and/or the avant garde movement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 811 Plains Literature****Crosslisted with:** ENGL 411**Prerequisites:** Junior standing.**Description:** Various forms of literature seen in the historical, cultural, and aesthetic context of the North American Great Plains.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 813 Film****Crosslisted with:** ENGL 413**Description:** Study of specific critical and historical film theory and approaches to film history using more difficult texts (both as films and as readings) for the students, to create an intense immersion into more complex films and critical readings. May be repeated once for credit with a different topic.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Film Studies**ENGL 814 Women's Literature****Crosslisted with:** ENGL 414, WMNS 414, WMNS 814**Prerequisites:** Junior standing.**Description:** A particular historical or other groups of literature by and about women, seen in their aesthetic and intellectual context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENGL 814B Modern and Contemporary Women Writers**Crosslisted with:** ENGL 414B, WMNS 414B, WMNS 814B**Prerequisites:** Junior standing.**Description:** Selected women writers from the twentieth and twenty-first century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 817 Topics in Place Studies and Environmental Humanities****Crosslisted with:** ENGL 417**Prerequisites:** Junior standing; two courses in ENGL above 199.**Description:** The in depth analysis of a particular topic in place studies and the environmental humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 820 Introduction to Linguistics****Crosslisted with:** ENGL 420**Description:** Introduction for advanced students to the history and methods of linguistics, to the theory of language, and to applications of linguistics in a variety of fields and disciplines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** ESL and Linguistics**ENGL 826 History of the English Language****Crosslisted with:** ENGL 426**Description:** Historical development of contemporary English with particular attention to its Old and Middle English background.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** ESL and Linguistics**ENGL 827 Applications of Linguistics****Crosslisted with:** ENGL 427**Prerequisites:** Junior standing.**Description:** Practical application of the principles of linguistics. Examples: TESOL Theory and Practice, Second Language Composition Theory and Practice, Introduction to First and Second Language Acquisition, Teaching of Grammar.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** ESL and Linguistics**ENGL 828 Old English****Crosslisted with:** ENGL 428**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Read and understand literary texts of the period in their historical context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 830 British Authors to 1800****Crosslisted with:** ENGL 430**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** The works of a particular major author, such as Chaucer, Shakespeare, or Milton situated within literary, historical, biographical, and critical context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 830A Shakespeare I****Crosslisted with:** ENGL 430A**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** How performance-based strategies can help in understanding and in teaching Shakespeare's plays. The historical and contemporary stage practices, the performance history of these plays, and recent criticism that engages with the insights of both Performance Theory and Semiotics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 830J Music and Text in the English Renaissance****Crosslisted with:** MUSC 830J**Prerequisites:** MUSC 366**Description:** Interconnections between musical and literary composition at a time when practitioners in both areas were profoundly influenced by developments in each others' fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENGL 832 American Authors to 1900

Crosslisted with: ENGL 432

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: The works of a particular major author seen in a wide critical context.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 833 American Authors Since 1900

Crosslisted with: ENGL 433

Prerequisites: Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.

Description: Extensive study in the works of a particular major author seen in a wide critical context.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 839 Film Directors

Crosslisted with: ENGL 439

Description: Intensive study of the films of one director or a small group of directors, with emphasis on an auteur approach. Weekly film screenings. May be repeated once for credit with a different topic.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Film Studies

ENGL 840 Classical Drama

Crosslisted with: CLAS 483, CLAS 883, ENGL 440

Prerequisites: Senior standing.

Description: Greek and Roman tragedy and comedy in translation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 845 Ethnic Literature

Crosslisted with: ENGL 445, ETHN 445

Prerequisites: Junior standing.

Description: Works of writers with connections to one or more American ethnic communities, seen in their historical, intellectual, and cultural context. Survey of ethnic literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 845B Topics in African American Literature

Crosslisted with: ENGL 445B, ETHN 445B

Prerequisites: Junior standing.

Description: The study of a particular topic in African American poetry, fiction, and/or non-fiction prose.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 845K Topics in African Literature

Crosslisted with: ENGL 445K, ETHN 445K

Prerequisites: Junior standing.

Description: Topics in African poetry, fiction, and/or non-fiction prose.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 845N Topics in Native American Literature

Crosslisted with: ENGL 445N, ETHN 445N

Prerequisites: Junior standing.

Description: Topics in Native American poetry, fiction, and/or non-fiction prose. Critical theory and cultural criticism.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

ENGL 852 Advanced Fiction Writing

Crosslisted with: ENGL 452

Description: For advanced students with previous experience in fiction writing. Longer projects in fiction writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Creative Writing

ENGL 852A Writing of Literary Non-Fiction

Description: Advanced (workshop) course for creative writers; emphasis on memoirs, personal essays, other forms of literary non-fiction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 853 Advanced Poetry Writing

Crosslisted with: ENGL 453

Description: For advanced students with previous experience in poetry writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Creative Writing

ENGL 854 Advanced Writing Projects**Crosslisted with:** ENGL 454**Description:** Advanced writing workshop in which experienced writers develop extended projects in writing, analyze their own and other's writing processes, and read widely in genres related to their projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Writing,Rhetoric,Culture**ENGL 857 Composition Theory and Practice****Description:** Recent research on language development and the process of writing. Applications of theory to composition instruction, especially in K-12 grades.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 857A Composition and Rhetorical Theory****Description:** Theoretical approaches to writing instruction and to the field of composition and rhetoric.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Writing,Rhetoric,Culture**ENGL 857B Nebraska Writing Project****Crosslisted with:** TEAC 857B**Description:** Topics in writing instruction, explored via the National Writing Project Institute model, for K-12 and college teachers of writing in all curricular areas.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 859 Writing For Film****Crosslisted with:** ENGL 459**Description:** Development of screenplays.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Film Studies**ENGL 862 Survey of Medieval Literature****Crosslisted with:** ENGL 462**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** The various genres and movements of Medieval English literature and their cultural context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 862A Ideas of Ethnicity in Medieval and Renaissance Literature****Crosslisted with:** ENGL 462A**Description:** Medieval and Renaissance literary texts that involve encounters between different religions and cultures. Readings from chronicles, romances, travel writings, debates, and epics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 863 Survey of Renaissance Literature****Crosslisted with:** ENGL 463**Description:** Extensive study of major authors and works of the sixteenth and early seventeenth centuries with particular attention to the development of poetic and prose literary forms and their cultural context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 864 British Literature, 1660-1800****Crosslisted with:** ENGL 464**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Major writers and critical issues of the period. Emphasis on poetry and nonfiction prose.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 865 Nineteenth-Century British Literature****Crosslisted with:** ENGL 465**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Poetry and prose of the Romantic and Victorian periods. Their intellectual and cultural context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 867 Literary History****Crosslisted with:** ENGL 467**Prerequisites:** Junior or senior standing and one of the following ENGL courses: 200, 205, 206, 208, 212, 215, 216, 230, 230A, 231, 242, 244, 260, or 261.**Description:** Theory of literary periods and movements and the causes for change among them. Periods, movements, and readings are taken from British literature from about 1475 to about 1950.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies

ENGL 871 Literary Criticism and Theory

Description: History, analysis and application of a variety of trends in literary and/or film theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 872 Digital Humanities Practicum

Crosslisted with: ENGL 472, HIST 472, HIST 872, ANTH 471, ANTH 871, MODL 472, MODL 872

Prerequisites: Junior standing.

Description: Provide students with real, in-depth experience in collaboratively creating digital humanities projects. Guided by faculty with expertise in a broad range of digital humanities methods and resources, students work in teams to tackle challenges proposed by UNL researchers and/or local and regional humanities organizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Digital Humanities

ENGL 875 Rhetoric

Crosslisted with: ENGL 475

Prerequisites: Junior or Senior standing

Notes: May not be offered every year.

Description: Rhetoric and rhetorical theory in relation to literature, composition, and language.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Writing,Rhetoric,Culture

ENGL 875A Rhetorical Theory: Rhetoric of Women Writers

Crosslisted with: ENGL 475A, WMNS 475A, WMNS 875A

Prerequisites: Junior standing.

Description: Rhetoric and rhetorical theory of women writers and speakers and its implications for literature, composition, literacy, feminist theory, and women's and gender studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Writing,Rhetoric,Culture

ENGL 877 Advanced Topics in Digital Humanities

Crosslisted with: ENGL 477

Prerequisites: Junior standing.

Description: Advanced Topics in Digital Humanities provides students the opportunity to study, learn, and practice a digital humanities method in considerable depth. These courses tend to be project oriented and frequently involve collaborative work. Topics will vary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Digital Humanities

ENGL 878 Digital Archives and Editions

Crosslisted with: ENGL 478

Prerequisites: Junior standing.

Description: The shift from printed to digital texts and its implications for the humanities. Practice in digitally representing texts, archival design, and analysis of representative electronic projects dedicated to a variety of authors and genres.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Digital Humanities

ENGL 880 Writing Center Theory, Practice, and Research

Description: Introduction to writing center theory and consulting practice. Students engage in research that contributes to scholarly conversations in writing center studies. Successful completion of ENGL 880 is strongly recommended for students seeking to work in the UNL Writing Center.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 881 GESL/Academic Research

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 882 Literacy Issues and Community

Crosslisted with: ENGL 482

Prerequisites: Junior standing

Notes: May include a literacy and/or writing internship in a community or workplace setting.

Description: Literacy theory and its application in school, community, and workplace environments.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Groups: Writing,Rhetoric,Culture

ENGL 884 GESL/Advanced Academic Writing

Prerequisites: Permission

Description: Individualized tutorial instruction focused on the student's particular grammar and writing problems.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 886 GESL and/or Academic Language Skills

Prerequisites: Permission

Description: For international graduate students designed to develop academic language skills.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 887 GESL and/or Academic Research Skills**Prerequisites:** Permission**Description:** Advanced tutorial in academic writing for international graduate students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 888 Spoken English for International Students****Prerequisites:** Permission**Description:** Speech improvement course for international graduate students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 889 Medieval Literature and Theology****Crosslisted with:** ENGL 489, RELG 489, RELG 889**Description:** The relationship between significant medieval theologies and primary medieval poets and prose masters.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**ENGL 890 Advanced Research Skills in English****Description:** Practical mastery of print, electronic, and other resources related to advanced study in English; understanding of scholarship as conversation, research as inquiry, authority as constructed and contextual, information creation as a process, searching as strategic exploration, and the various kinds of value that information has.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ENGL 893 From Comprehensive Exams to Dissertation****Description:** Educates and supports graduate students as they prepare and work through their doctoral exam lists and begin their dissertation research and writing.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ENGL 895 Internship in Teaching English****Prerequisites:** Permission**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**ENGL 895A Nebraska Writing Project Internship****Crosslisted with:** TEAC 895A**Prerequisites:** Permission**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 895E Internship in Digital Humanities****Crosslisted with:** MODL 895, HIST 895**Description:** Active participation in an ongoing digital humanities project in the Center for Digital Research in the Humanities, including weekly meetings designed to build technical and project management skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 897 Independent Directed Reading****Crosslisted with:** ENGL 497**Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Groups:** Ind Study, Special Top, Intern**ENGL 898 Special Topics****Crosslisted with:** ENGL 498**Prerequisites:** Senior standing.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Ind Study, Special Top, Intern**ENGL 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ENGL 901 Seminar in Drama****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 902 Seminar in Poetry****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 905 Seminar in Prose Fiction****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 911 Seminar in Plains Literature****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC

ENGL 913 Studies in Film**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ENGL 914 Seminar in Women Writers****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 915 Popular Literature****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 918 Interdisciplinary Seminar in Nineteenth-Century Studies****Crosslisted with:** HIST 918, MODL 918**Description:** Invention of the nineteenth century, gender, colonialism, class, realism science and technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**ENGL 919 Interdisciplinary Approaches to the Nineteenth Century****Crosslisted with:** HIST 919, MODL 919**Description:** Introduction to the nineteenth century in North America (focusing on the US), Great Britain, and Europe (focusing on France, Germany, Russia, and Spain), organized through themes such as constructions of gender and sexuality, democracy in the nation-state, and challenges to religion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 920 Seminar in Linguistics****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 927 Stylistics****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 930 Seminar in British Authors to 1800****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 931 Seminar in British Authors since 1800****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 932 Seminar in American Authors to 1900****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 933 Seminar in American Authors since 1900****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 940 Seminar in African-American Literature****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 945 Seminar in Ethnic Literature****Crosslisted with:** ETHN 945**Description:** Issues of importance to a particular ethnic experience through the study of relevant literary texts.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ENGL 946 Interdisciplinary Readings in Digital Humanities****Crosslisted with:** MODL 946, HIST 946, ANTH 946**Description:** Methods, theories, and practices of digital humanities scholarship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENGL 953 Seminar in Creative Writing****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**ENGL 957 Composition Theory and Practice****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC

ENGL 957B Nebraska Writing Project

Crosslisted with: TEAC 957B

Description: Summer institute for K-12 and college teachers of writing in all curricular areas, taught on the National Writing Project model.

Credit Hours: 6

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

ENGL 961 Seminar in American Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 962 Seminar in Medieval Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 963 Seminar in Renaissance Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 964 Seminar in Restoration and Eighteenth-Century Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 965 Seminar in Nineteenth-Century Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 967 Seminar in Modern Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 970 Literary Theory

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ENGL 971 Seminar in Literary Theory

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 973 Seminar in Literacy Studies

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 976 Seminar in Rhetorical Theory

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 986 Approaches to English Studies

Description: Emerging models of English studies that cross traditional boundaries. Traces disciplinary concerns across three registers: scholarship, curriculum, and pedagogy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 987 Seminar in Humanities and Public Policy

Description: Strategies for using the humanities to change or develop policy, the public policy roles of humanities and education scholars, and strategies for obtaining funding, permanence, and effectiveness.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ENGL 988 Introduction to the Interdisciplinary Study of the Middle Ages

Crosslisted with: AHIS 988, HIST 988, MODL 988, MUSC 988

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Middle Ages. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 989 Introduction to the Interdisciplinary Study of the Renaissance

Crosslisted with: AHIS 989, HIST 989, MODL 989, MUSC 989

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Renaissance. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENGL 990 Introduction to Research and Scholarship in English

Description: Introduction to a variety of approaches to research and scholarship current in the discipline.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 991 Nebraska Literature Project

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 992 Nebraska Humanities Project

Crosslisted with: TEAC 992

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 992B Place Conscious Teaching

Crosslisted with: TEAC 992B

Description: Theory and practice of teaching writing, literature, and rhetoric in connection with local place, region, and community.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

ENGL 993 Academic Professionalization and Presentation

Description: Personalized feedback on job application materials and assistance in preparing materials that present the student's advanced graduate work.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

ENGL 994 Application of Learning and Teaching English

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ENGL 995 Teaching of Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

ENGL 996 Bibliography and Methods

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: IND

ENGL 997 Independent Directed Reading

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

ENGL 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Entomology (ENTO)

ENTO 800 Insect Biodiversity

Prerequisites: 12 hrs. of biological sciences, graduate standing and ENTO 116 or equivalent for entomology majors

Description: Classification, taxonomy, and biology of adult insects. Identification of orders and families of insects using keys. Collection required using techniques for collecting, preparing, and curating. One oral/written term paper required.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

ENTO 801 Insect Physiology

Crosslisted with: ENTO 401

Prerequisites: CHEM 251 or CHEM 255; 12 hrs entomology or biological sciences (zoology).

Description: Functions and other phenomena associated with the major organ systems of insects; the cuticle, nervous, circulatory, digestive, metabolism, nutrition, locomotion, reproduction, respiration, and growth and development.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

ENTO 801L Insect Physiology Lab

Prerequisites: CHEM 251 or CHEM 255; 12 hrs. entomology or biological sciences (zoology)

Notes: Must also register for required lecture ENTO 801.

Description: Functions and other phenomena associated with the major organ systems of insects; the cuticle, nervous, circulatory, digestive, metabolism, nutrition, locomotion, reproduction, respiration, and growth and development.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LAB

ENTO 802 Aquatic Insects**Crosslisted with:** BIOS 485, BIOS 885, ENTO 402, NRES 402, NRES 802**Prerequisites:** 12 hrs biological sciences.**Description:** Biology and ecology of aquatic insects.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L**ENTO 802L Identification of Aquatic Insects****Crosslisted with:** BIOS 485L, BIOS 885L, ENTO 402L, NRES 402L, NRES 802L**Prerequisites:** Parallel ENTO 802, NRES 402/802, BIOS 485/885.**Description:** Identification of aquatic insects to the family level.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**ENTO 803 Management of Horticultural Crop Insects****Crosslisted with:** ENTO 403**Prerequisites:** Introductory biology course.**Description:** The biology, ecology and management of insect pests of horticultural crops such as vegetables, fruit trees, trees and shrubs, greenhouse crops, turf and ornamentals. Employing Integrated Pest Management (IPM) strategies to maintain pests below damaging levels while minimizing the use of traditional insecticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 805 Introduction to Entomology****Prerequisites:** Permission**Description:** Introduction to insects (diversity, identification, morphology and physiology, ecology and behavior, and pest management). Beneficial, economic, and medical importance of insects.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**ENTO 806 Insect Ecology****Crosslisted with:** BIOS 406, BIOS 806, ENTO 406**Prerequisites:** BIOS/NRES 220 and 222.**Description:** Biotic and abiotic factors as they influence insect development, behavior, distribution, and abundance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 809 Insect Control by Host-Plant Resistance****Crosslisted with:** ENTO 409**Prerequisites:** 12 hrs agricultural sciences and/or biological sciences including one course in entomology and one course in genetics.**Description:** Explore resistance of crops to herbivorous arthropods. Investigate how insect behavior and physiology are affected by resistance, critically review current research on plant resistance genes, and the molecular, biochemical and physiological aspects of insect/microbe interactions with host plants.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 810 Insects as Educational Tools for the Classroom****Prerequisites:** Introductory entomology course**Description:** Overview of insects. Insect diversity, insect structure and function, insect ecology and behavior, and the beneficial and detrimental roles insects play. Integrating the study of insects into the classroom to enhance science education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 812 Entomology and Pest Management****Crosslisted with:** ENTO 412**Prerequisites:** Introductory course in ENTO.**Description:** Principles and practices of managing insects pests. Pest management theory, use of sampling, evaluation, tactics, types of insect pests, and current issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 813 Biological Control of Pests****Crosslisted with:** PLPT 813**Prerequisites:** 12 hrs biological sciences and/or agricultural sciences**Description:** Principles and practices of using natural enemies and antagonists to manage the abundance of pests and reduce economic losses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 814 Forensic Entomology****Crosslisted with:** ENTO 414, FORS 414, FORS 814**Prerequisites:** ENTO 115 or equivalent introductory course.**Description:** Application of entomology to legal issues. Criminal investigations, insects of forensic importance, insect succession on carrion, and case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENTO 815 Medical Entomology**Crosslisted with:** ENTO 415**Prerequisites:** Introductory course in ENTO.**Description:** Direct and indirect importance of insects in human medicine. Principles of arthropod-borne disease, medically important arthropod groups, and arthropod-transmitted diseases.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 815A Self-pollinated Crop Breeding****Crosslisted with:** AGRO 815A**Prerequisites:** AGRO 215**Description:** Self-pollinated plant breeding theory and methods. Pedigree, bulk, single seed descent, back-crossing methods and inbreeding theory.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**ENTO 815B Germplasm and Genes****Crosslisted with:** AGRO 815B**Prerequisites:** AGRO 215**Description:** Obtaining germplasm and genes from cultivated plants, wild relatives of cultivated plants, and the biosphere. Origination of crops, mutation genetics, biotechnology as a source of genes, chromosomal engineering and plant reproduction.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**ENTO 815D Cross-pollinated Crop Breeding****Crosslisted with:** AGRO 815D**Prerequisites:** AGRO 215**Description:** Cross-pollinated breeding theory and methods. Genes in populations, recurrent selection methods, creating populations, hybrid production practices, and population improvement theory.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Prerequisite for:** AGRO 816B; AGRO 816E**ENTO 817 Pest Management Systems****Prerequisites:** 10 hrs entomology and crop production courses**Description:** Different philosophies and theories of insect pest management, theory vs. reality of management, interactions of public and private sectors, development and implementation of pest management programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 818 Insect Identification and Natural History****Prerequisites:** Introductory course in entomology**Notes:** Credit toward the degree may not be earned in both ENTO 800 and ENTO *818.**Description:** Biology and identification of major insect orders, families, classification, and ecology.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**ENTO 819 Insect Behavior****Prerequisites:** Introductory course in entomology**Description:** The process of behavioral study involves investigating the relationship between animals and their surroundings, and their response to their kin and to other organisms. Topics include characterizing how insects find and defend their resources, how they avoid predators, how they find mates, how they mate, and how some exist in highly ordered social settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 820 Insecticide Toxicology****Prerequisites:** 12 hrs biological sciences; 4 hrs organic chemistry**Description:** Principles of toxicology, insecticide classification, mode of action, metabolism and consequences of insecticide use.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 825 Management of Agronomic Crop Insects****Prerequisites:** An introductory entomology course**Description:** Identification, biology, ecology and management of insect pests of agronomic crops such as corn, soybeans, sorghum, wheat, and alfalfa. Integrated Pest Management (IPM) strategies employed to maintain pests below damaging levels while minimizing the use of traditional insecticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 827 Population and Ecological Genetics****Prerequisites:** Introductory Genetics, Introductory Algebra**Description:** Introduction to key theoretical concepts in population genetics and their application. Mutation, genetic drift, structured populations, natural selection, molecular evolution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENTO 828 Scientific Illustration**Crosslisted with:** AGRI 828, AGRO 828, HORT 828**Prerequisites:** 12 hrs agricultural and/or biological sciences.**Description:** Prepare scientifically accurate, high quality illustrations and graphics for the teaching, presentation, and publication of scientific information. Drawing techniques, drafting, copyright, and publication and presentation of scientific art work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 830 Introduction to the Development of Distance Education Courses****Crosslisted with:** ALEC 830**Description:** Introduction to practical aspects of developing and facilitating distance education courses. Create and facilitate interaction, assessments, course delivery, assignments, course etiquette and ADA compliance. Develop a distance course module grounded in distance education theory and instructional design principles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 835 Chemical Ecology of Insect-Plant Interactions****Prerequisites:** 15 hours of agricultural sciences and/or biological sciences including one course in entomology & one course in biochemistry.**Description:** A focus on insect-plant interactions including direct and indirect plant defenses against herbivory, tritrophic interactions among plant, insect herbivores and herbivore natural enemies, biochemical mechanisms of plant defenses, insect herbivore-produced elicitors of plant defenses, semiochemicals based IPM, chemical ecology of insect vectors of plant diseases, and chemical ecology of insect pollination.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**ENTO 837 IPM in Sensitive Environments****Description:** Concepts of Integrated Pest Management (IPM) and methods used to control insect pests in sensitive environments such as schools, day cares, hospitals, nursing homes, zoos, and prisons.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL**ENTO 882 Field Entomology****Crosslisted with:** BIOS 482, BIOS 882, ENTO 482**Prerequisites:** 12 hrs biological sciences.**Notes:** Offered only at Cedar Point Biological Station.**Description:** Field course in insect taxonomy and biology emphasizing field collection, specimen preparation, classification, and insect natural history.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SUMMER**ENTO 888 MS Degree Project****Prerequisites:** Completion of 24 hrs toward the MS degree**Description:** Application of graduate course work for the non-thesis MS degree program.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** FLD**ENTO 896 Independent Study in Entomology****Crosslisted with:** ENTO 496**Prerequisites:** 12 hrs biological sciences and/or agricultural sciences.**Notes:** Independent study contracts must be filed with the department.**Description:** Individual or group projects in research, literature review, or extension of course work.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** IND**ENTO 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ENTO 905 Seminar in Entomology****Description:** Presentation of topics in entomology or related subjects.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 8**Format:** LEC**ENTO 915 Presentation Methods****Prerequisites:** Permission**Description:** This course prepares entomology graduate students to give scientific and public presentations. It includes instruction in preparing posters and on-screen shows, image editing, finding entomological resources in libraries and on the internet, insect photography, and public speaking. Students develop a portfolio of their work, and they make two 12- and one 30-minute presentations to their classmates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 920 Xenobiotics in the Environment****Crosslisted with:** AGRO 920, EOHT 920, HORT 920, NRES 920**Prerequisites:** Recommend one course each in organic chemistry, soil science, biochemistry, plant physiology, microbiology and ecology**Description:** Fate and ecotoxicological impacts of biologically foreign compounds in soil-water-plant environments; uptake, mechanisms of toxicity and metabolism in plants and other biota. Herbicides and other pesticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

ENTO 960 Biosystematics and Nomenclature**Crosslisted with:** BIOS 960**Description:** Methods and principles of systematics and nomenclature.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTO 991 Advanced Topics in Entomology****Prerequisites:** Permission**Description:** Advanced study of selected topics not presented in established courses.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** LEC**ENTO 996 Research in Entomology****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** IND**ENTO 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Entrepreneurship (ENTR)

ENTR 821 Initiating and Managing Entrepreneurial Growth**Crosslisted with:** MNGT 821**Prerequisites:** MNGT 321 and 360**Description:** Focuses on the management of new firms, including small businesses designed to be lifestyle ventures and firms destined to grow. Exposure to variety of growth opportunities including franchising, organic growth and expansion of smaller businesses or units within larger firms. Teaches how to manage a new business and exploit an entrepreneurial opportunity and manage resources to sustain the firm once the business is running. Learn through a variety of hands-on methods designed to enhance their critical thinking and practical business skills. Case study analysis and exposure to thought leadership in the field are part of the core learning methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTR 822 Managing Rapid Growth and Change in Organizations****Crosslisted with:** MNGT 822**Prerequisites:** MNGT 321 or 360**Description:** Addresses financial, human resource, operations and marketing issues that face entrepreneurs whose businesses are confronted with significant growth. In addition, will learn change management concepts that are targeted towards managing an organization in extremely turbulent times. Prepares students to work in fast-growth firms, whether they are interested in starting their own business or joining an already established fast-growth firm. Helpful for students interested in fast-growth industries such as life science and high technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTR 823 Business Plan Development and Decision Making****Crosslisted with:** MNGT 823**Prerequisites:** MNGT 321 or MNGT 360**Notes:** ENTR 823 may be taken by non-management majors with departmental permission.**Description:** Takes an in-depth look at the business planning process. By the end of the class, students produce their own business plans. Learn through their own business plan writing, through in-depth cases studies, by engaging in role plays and by interacting with business executives. Business plans are a critical part of any organization, thus, preparing students to develop business plans for a variety of new concepts and ideas, whether inside an established firm or as part of the start-up new venture. Students will be asked to enter their business plans into the business planning competitions in which the University participates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ENTR 888 Business Management for Agricultural Enterprises****Crosslisted with:** HORT 488, HORT 888, EAEP 488, AGRO 488, ENTR 488, EAEP 888, AGRO 888, ABUS 488**Description:** Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. Requires the completion of a shadowing assignment and the analysis of case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Environmental Engineering (ENVE)

ENVE 851 Soils, Water, and Environmental Chemistry**Crosslisted with:** NRES 451, NRES 851**Prerequisites:** NRES/WATS/SOIL/AGRO/GEOL 361 or graduate standing**Description:** Environmental chemistry related to the fate and transport of organic contaminants in soil-water environments. Application of computer simulation models (i.e., MODFLOW) for predicting contaminant fate in aquifers. Basic chemical and biological principles of remediating contaminated soil and water.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING

ENVE 890 Practicum in Environmental Engineering**Prerequisites:** Permission**Description:** Problems in engineering or management in a non-academic experience within the private sector or a government agency. Research, design, analysis, and testing.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**ENVE 898 Special Problems in Environmental Engineering****Prerequisites:** Permission**Description:** Special research-oriented problems in current topics in environmental engineering.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**ENVE 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**ENVE 990 Seminar in Environmental and Water Resources Engineering****Prerequisites:** Permission**Description:** Current research topics and projects in environmental and water resources engineering and closely allied areas.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ENVE 998 Special Topics in Environmental Engineering****Prerequisites:** Permission**Description:** Independent library and/or experimental research, analysis, evaluation and presentation of current and advanced topics in environmental engineering and closely related areas.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

Ethnic Studies (ETHN)

ETHN 848 Family Diversity**Crosslisted with:** ETHN 448, SOCI 448, SOCI 848**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Analyzes diversity in family structure and family choices. Includes: rural families, gay/lesbian families, Native American families, African American families, Latino families, working class and working poor families and cohabitation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ETHN 881 Minority Groups****Crosslisted with:** ETHN 481, SOCI 481, SOCI 881**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Systematic examination of racial, ethnic, and other minority groups. History and present status of such groups, the origins of prejudice and discrimination, and the application of social science knowledge toward the elimination of minority group problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**ETHN 890 Critical Issues in U.S. and Global Society: Race, Social Justice and Inequality****Description:** Contemporary and historical issues surrounding race, social justice and inequality. Topics include racism and inequality in U.S. society, environmental and social justice, and global issues such as migration and human trafficking. Letter grade only.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**ETHN 896 Independent Study in Ethnic Studies****Prerequisites:** Permission**Description:** Individual or group study on a topic in Ethnic Studies under the supervision and evaluation of an Ethnic Studies faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**ETHN 945 Seminar in Ethnic Literature****Crosslisted with:** ENGL 945**Description:** Issues of importance to a particular ethnic experience through the study of relevant literary texts.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**ETHN 983 Readings and Problems in Race, Ethnicity, and Identity in History****Crosslisted with:** HIST 983**Description:** Engages with recent and classic scholarship on race, ethnicity, and identity, primarily in American history. Covers new comparative and transnational scholarship. May emphasize different themes and readings depending on area of expertise of faculty. Letter grade only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Finance (FINA)

FINA 801 Quantitative Methods in Finance

Prerequisites: Admission to the Masters of Science in Finance program or by permission.

Description: Practical use of statistical and quantitative methods that have wide applicability in business and financial decision making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 802 Fixed Income Analysis

Prerequisites: Admission to the Masters of Science in Finance program or by permission.

Description: Basic understanding of fixed-income markets, fixed-income securities, and tools employed by market participants to the analysis of fixed-income investments.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 803 Case Studies in Financial Management

Prerequisites: Admission to the Masters of Science in Finance program or by permission.

Description: Development and implementation of financial strategies and policies. Cases will cover financial statement analysis, working capital management, capital structure planning, cost of capital, and capital expenditure analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 804 Portfolio Management II & Ethics

Prerequisites: Admission to the Masters of Science in Finance program or by permission.

Description: Covers elements of the investment management process. Investment management process considers risk, return, and investment constraints. Ethical considerations of this investment management industry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 807 Property and Liability Insurance

Prerequisites: FINA 307

Description: Open to masters level and PhD students only. Analysis of risk theory, property and liability risks, and the economic functions of property insurance. Traditional and modern theories of risk, property and liability coverages, and functional insurance areas. The role of property and liability insurance in meeting current economic and social problems in urban core areas of major central cities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 812 Life and Health Insurance

Crosslisted with: FINA 412

Prerequisites: 2.5 cum GPA; FINA 338.

Description: The economic functions of life insurance. The human-life value concept and the basic forms of life insurance and annuities used in insuring life values. Life insurance pricing, functional company operations, legal aspects, and contractual provision. Health and other specialized forms of human-life value insurance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 813 Social Insurance

Crosslisted with: ECON 813, FINA 413, ECON 413

Description: Nature and causes of economic insecurity. Analysis of public programs such as Social Security, unemployment insurance, workers' compensation, and public assistance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: General Economics and Theory

FINA 820 Employee Benefit Plans

Crosslisted with: FINA 420

Prerequisites: ECON 210, or 211 and 212; FINA 307

Description: Analysis of group life insurance, group medical expense and disability income insurance, private pension plans, profit sharing and thrift plans, Section 401(k) plans, individual retirement accounts (IRAs), Keogh plans for the self-employed, group property and liability insurance, and other employee benefits. An analysis of major public policy issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 838 Enterprise Risk Management

Crosslisted with: FINA 438

Prerequisites: FINA 338.

Description: Major and minor pure loss exposures facing business firms, the alternative risk management techniques for dealing with these exposure, the most appropriate technique(s) for controlling each exposure, and the financial results so the risk management program remains effective. Actual risk management audits of business firms and case studies are used to integrate the concepts, techniques, and tools.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 850 Multinational Financial Analysis

Prerequisites: GRBA 811 and permission

Notes: FINA 850 is open to masters level and PhD students only.

Description: International aspects of financial management. Exchange risk analysis and management. Accessing international capital markets. International capital budgeting. Numerical optimization technique.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FINA 855 Capital Markets and Financial Institutions**Prerequisites:** FINA 365**Notes:** Open to masters level and PhD students only.**Description:** Analysis of the development and functions of the various financial institutions, with emphasis on the nonbank financial intermediary. Sources and uses of funds for each of the major types of intermediary, the nature and structure of financial markets, the behavior of financial institutions, and the theories of interest rate determination.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 861 Advanced Finance****Crosslisted with:** FINA 461**Prerequisites:** 2.5 cum GPA; FINA 361/361H with a grade of C or above; or ACTS 440/840.**Description:** Advanced development of the corporate finance tools used in financial management. Application of quantitative techniques used in financial statement forecasting, advanced capital budgeting, advanced cost of capital estimation, corporate valuation, and external financing policy of the firm.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** FINA 475**FINA 862 Security Valuation and the Buffett Investment Method****Prerequisites:** GRBA 811 or equivalent**Description:** This course covers methods used to value publicly-traded and private equities. Methods used by Warren Buffett are emphasized.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**FINA 863 Portfolio Management****Prerequisites:** GRBA 811**Description:** The workings of securities markets. The fundamental intuition of the risk-return trade-off. The role of information in financial markets. All major asset pricing models and application to risk management in a portfolio context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** FINA 467, FINA 867**FINA 865 Bank Management****Crosslisted with:** FINA 465**Prerequisites:** 2.5 cum GPA; FINA 361/361H with a grade of C or above or ACTS 440/840; and FINA 365.**Description:** Bank asset management; policy and practices for reserves, loans and investments. Internal organization of commercial banks. New problems and recent innovations in commercial banking.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 867 Options, Futures and Derivative Securities****Crosslisted with:** FINA 467**Prerequisites:** 2.5 cum GPA; FINA 338 or 367 or 863.**Description:** The use of derivative securities in risk reduction and portfolio management strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ACTS 405**FINA 867A Options, Futures and Derivative Securities for Actuarial Science****Crosslisted with:** FINA 467A**Prerequisites:** ACTS 441 and STAT 380.**Description:** Introduction to financial mathematics related to pricing of derivative securities, including standard options, exotic options and interest rate and bond derivatives. Covers required material for the Society of Actuaries Models for Financial Economics (MFE) exam.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 871 Nonprofit Financial Management****Prerequisites:** Admission to the MBA or MPA program or by permission of the MBA director.**Description:** Financial Management for the non profit firm examines the planning process for operating, capital expenditure, and cash budgets. This process includes long-term financial planning and the importance of capital structure and investment policies that are aligned to the organization's strategic objectives. All these topics build on the foundation of nonprofit accounting and nonprofit financial statements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**FINA 882 Real Estate Finance****Crosslisted with:** FINA 482**Prerequisites:** FINA 382.**Description:** Consideration of procedure, instruments, techniques, and trends in financing urban real property; an examination of realty credit markets and sources of funds (private and public); valuation of real property for lending and investment purposes; and measurement of investment performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND

FINA 907 Insurance Seminar**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 960 Financial Management****Prerequisites:** Completion of the MBA core requirements

Description: Open to masters level and PhD students only. Assuming a background of knowledge which includes the finance function in business and the technique of financial analysis, this course confronts the student with the unique role of financial management which relates both to the company as an operating entity and to the interest of the owners in the results of the operation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 961 Advanced Theory of Finance****Prerequisites:** FINA 361

Description: Open to masters level and PhD students only. Critical examination of the relation of the capital markets to the external financing problems of the firm. Advanced developments of the finance specialization with major emphasis on the theoretical issues.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** FINA 994**FINA 962 Research Methods in Finance and Accounting****Prerequisites:** Admitted to PhD degree program in Economics or the College of Business Administration

Description: This class covers the research methods used in accounting and finance. Emphasis is on empirical testing using statistical and mathematical programming languages.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 963 Survey of Teaching Methods in Business****Prerequisites:** Admission to PhD degree program in Finance

Description: This course is a primer to help facilitate new PhD candidates in their transition from student to teacher. The course is largely self-directed study, however there is mentoring from a faculty member. The course is based around four accountabilities. The student will learn strategies to develop: 1) an environment conducive to learning, 2) a curriculum, 3) a delivery system for the curriculum, and 4) an evaluation system. The course culminates with the construction of a teaching portfolio.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**FINA 965 Seminar in Banking****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 966 Seminar in Investments****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 968 Seminar in Finance****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 969 Finance Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 994 Seminar in Selected Subjects: Special Topics****Prerequisites:** FINA 961**Notes:** Open to PhD students only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FINA 996 Directed Reading or Research****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Format:** IND**FINA 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Food Science and Technology (FDST)

FDST 801 Teaching Applications of Food Science**Crosslisted with:** FDST 401**Prerequisites:** BIOS 101 and CHEM 109**Notes:** Will not count toward a FDST major or minor.

Description: Overview of the science of food and how food can be used in the classroom to enhance science education.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

FDST 803 Food Quality Assurance**Crosslisted with:** FDST 403**Prerequisites:** FDST 205; STAT 218.**Description:** Quality related issues as they pertain to manufacturing, processing, and/or testing of foods, with a major emphasis on food regulations, statistical process control and Hazard Analysis of Critical Control Points (HACCP).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 805 Food Microbiology****Crosslisted with:** BIOS 445, BIOS 845, FDST 405**Prerequisites:** BIOS 312; CHEM 251; BIOC 321.**Description:** Nature, physiology, and interactions of microorganisms in foods. Introduction to food-borne diseases, the effect of food processing systems on the microflora of foods, principles of food preservation, food spoilage, and foods produced by microorganisms. Food plant sanitation and criteria for establishing microbial standards for food products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** BIOS 446, BIOS 846, FDST 406, FDST 806; FDST 415, FDST 815; FDST 425, FDST 825; FDST 455, FDST 855; FDST 455L, FDST 855L; FDST 460, FDST 860; FDST 875; FDST 877; FDST 908B**FDST 806 Food Microbiology Laboratory****Crosslisted with:** BIOS 446, BIOS 846, FDST 406**Prerequisites:** Parallel in FDST 405/805/BIOS 446/846.**Description:** The microorganisms in foods and the methods used to study them.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LAB**Prerequisite for:** FDST 415, FDST 815**FDST 812 Cereal Technology****Crosslisted with:** FDST 412**Prerequisites:** FDST 205.**Description:** Chemistry and technology of the cereal grains. Post-harvest processing and utilization for food and feed. Current industrial processes and practices, and the theoretical basis for these operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 815 Molds and Mycotoxins in Food, Feed, and the Human Environment****Crosslisted with:** FDST 415**Prerequisites:** FDST 405/805/BIOS 445/845 and FDST 406/806/BIOS 446/846.**Description:** Occurrence, growth, and mycotoxin production of molds in human foods, animal feeds, and the human environment. Spoilage, mycotoxin production conditions, toxicity, and pathological effects. Culture media, methods and techniques for enumerating and identifying molds, analytical methods for mycotoxins, and effects of food and feed processing on mycotoxin stability.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 819 Meat Investigations****Crosslisted with:** ASCI 419, ASCI 819, FDST 419**Prerequisites:** ASCI 210**Description:** Conduct independent research and study meat industry problems in processing, production, storage, and preparation of meat and meat products.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 820 Fruit and Vegetable Technology****Crosslisted with:** FDST 420**Prerequisites:** FDST 205.**Description:** Harvesting and postharvest handling of fruit and vegetables, processing and safety issues, processes of ripening and/or maturation in fresh fruits and vegetables.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 823 Food Safety Risk Analysis****Prerequisites:** Instructors' approval**Description:** Risk analysis principles applied to food safety issues; quantitative approaches for risk assessment using epidemiological, statistical and simulation tools; step-by-step demonstration of quantitative risk assessment model development; methods for framing risk management questions; introduction of risk communication; real-world examples of microbial, food allergen, and chemical risk assessment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

FDST 825 Food Toxicology**Crosslisted with:** FDST 425**Prerequisites:** FDST 405/805, BIOC 321, or equivalent.**Description:** Toxic substances that may be found in foods with emphasis on bacterial toxins, mycotoxins, and naturally occurring toxicants of plants, animals, and seafood. Basic toxicological methodology and the effects of food processing and handling on food-borne toxicants.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 829 Dairy Products Technology****Crosslisted with:** FDST 429**Prerequisites:** FDST 205**Description:** Physical, chemical, and microbiological properties of milk. Principles of milk processing and manufacture of cultured dairy products, cheeses, ice cream, and concentrated dairy products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 830 Sensory Evaluation****Crosslisted with:** FDST 430, STAT 430, STAT 830**Prerequisites:** Introductory course in statistics.**Description:** Food evaluation using sensory techniques and statistical analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 841 Functional Properties of Food****Crosslisted with:** FDST 441, NUTR 441, NUTR 841**Prerequisites:** NUTR 245 and BIOC 321; or FDST 448.**Description:** Relationship of structure and functionality of ingredients in food systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NUTR 449**FDST 842 Omnivore's Digestive-Tract Microbiome****Crosslisted with:** FDST 442**Prerequisites:** BIOS 312 or equivalent**Description:** Detailed examples and conceptual overview of studies that define the digestive tract microbial ecosystem both at the local and systemic scale in the context of omnivores such as humans and animals are presented. The concepts in focus are associated with high-dimensional datasets (or big data) used for studying these complex biosystems, and the multi-dimensional interactions between the microbiomes in its ecosystem. Topics include the host-cycle of life in health and disease in relation to the bacteria of the digestive tract, as well as the modification of their ecology due to health issues, nutrition, and microbial competition or chemical modification.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**FDST 845 Experimental Foods****Crosslisted with:** FDST 445, NUTR 445, NUTR 845**Prerequisites:** NUTR 244 and 245; BIOC 321.**Description:** Introduction to food research. Application of research techniques to selected problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NUTR 449**FDST 848 Food Chemistry****Crosslisted with:** FDST 448**Prerequisites:** FDST 205; CHEM 251; BIOC 321.**Description:** Molecular components of various foods and the reactions of these components during the processing of foods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 917; FDST 449, FDST 849; FDST 452, FDST 852; FDST 458, FDST 858; FDST 460, FDST 860; NUTR 449**FDST 849 Food Chemistry Laboratory****Crosslisted with:** FDST 449**Prerequisites:** FDST 205; FDST 448/848 or parallel; BIOC 321.**Description:** Experiments involving the isolation, purification, and characterization of the molecular components of foods.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**Prerequisite for:** FDST 458, FDST 858**FDST 852 Physical Chemistry of Foods****Crosslisted with:** FDST 452**Prerequisites:** FDST 448/848 or instructor approval.**Description:** The basic theory of physical chemistry that is relevant in food science and technology. Understand and predict changes occurring in a food during processing, storage, and handling using physical chemistry theory. Design and improvement of processes to make foods having specific qualities in an efficient way.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 855 Microbiology of Fermented Foods****Crosslisted with:** FDST 455**Prerequisites:** FDST 405/805**Notes:** On-campus students must also register for FDST 455L/855L.**Description:** Physiology, biochemistry, and genetics of microorganisms important in food fermentation. How microorganisms are used in fermentation and the effects of processing and manufacturing conditions on production of fermented foods.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC

FDST 855L Microbiology of Fermented Foods Laboratory**Crosslisted with:** FDST 455L**Prerequisites:** FDST 405/805 and parallel FDST 455/855**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**FDST 858 Advanced Food Analysis****Crosslisted with:** FDST 458**Prerequisites:** FDST 205, 448/848, and FDST 449/849.**Description:** Theory and application of molecular and atomic spectroscopy, immunochemistry and thermal methods to the analysis of foods. Chemical separation techniques for the isolation of food constituents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 860 Food Product Development Concepts I****Crosslisted with:** FDST 460**Prerequisites:** FDST 805 and FDST 848**Notes:** Capstone course.**Description:** Develop a commercially viable food product using chemical, microbiological and sensory analysis principles, and marketing and packaging sciences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 865 Food Engineering Unit Operations****Crosslisted with:** FDST 465, MSYM 465, MSYM 865**Prerequisites:** FDST/MSYM 363.**Description:** Unit operations and their applications to food processing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 870 Nutraceuticals and Functional Foods****Crosslisted with:** FDST 470**Prerequisites:** BIOC 321 or BIOC/BIOS/CHEM 431/831.**Description:** Evaluation of natural compounds impact on human health. Inflammation, cancer, heart disease, and the impact of gut micro-flora on health.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 871 A Multidisciplinary Overview of Food Safety and Security****Prerequisites:** 3 hrs BIOS or CHEM**Description:** Instruction in FDST 871 is provided by numerous subject matter experts. Multidisciplinary food safety and security perspectives. Food safety policy, ag bioterrorism, border security, animal ID, food defense, and site security, risk analysis, crisis communication, epidemiology, Hazard Analysis and Critical Control Point System, and more.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 872 Principles of Hazard Analysis and Critical Control Point System****Prerequisites:** 3 hrs BIOS or CHEM**Description:** The Hazard Analysis and Critical Control Point (HACCP) System and its application in the food industry.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 873 Food-borne Toxicants****Prerequisites:** 3 hrs BIOS or CHEM**Description:** Mechanisms of action, metabolism, sources, remediation and/or detoxification, and risk assessment of major food-borne toxicants of current interest. Design of Hazard Analysis and Critical Control Point plans for use in food industries to target food-borne toxicants.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 874 Food Laws, Regulations, and the Regulatory Process****Prerequisites:** 3 hrs FDST at 200 level or above**Description:** FDST 874 has presentations by state and federal food regulators. History of the development of the current federal state food regulations. Guidelines that govern the practice of regulating the wholesomeness of red meats, poultry, and eggs.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 875 Rapid Methods in Food Microbiology****Prerequisites:** FDST 405/805/BIOS 445/845**Description:** The different types of rapid microbial detection approaches available for use in foods. Commercial reagents and detection platforms, and the "next generation" approaches currently under development in academia or industry. Challenges to detection posed by the complexity of most food matrices and the sample preparation methods for separating microorganisms from such matrices.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 876 Risk Assessment for Food, Agriculture, and Veterinary Medicine****Prerequisites:** 3 hrs STAT**Description:** Risk assessment principles as applied to biological systems. Exposure and effects characterization in human and animal health and ecological risk assessment. Risk analysis frameworks and regulatory decision-making. Introduction to quantitative methods for risk assessment using epidemiological and distributional analyses. Uncertainty analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

FDST 877 Advanced Food Microbiology and Biotechnology**Prerequisites:** FDST 405/805/BIOS 445/845**Description:** Basic principles in biotechnology and applied food microbiology. Current topics of interest in food biotechnology. Introduction to recombinant DNA techniques and how they are applied to genetically modify microorganisms. The use of nucleic acids as tools of rapid detection of microorganisms in foods, basic enzyme immobilization and down-stream processing techniques, and regulatory aspects of food biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FDST 878 Food Protection and Defense: Essential Concepts****Prerequisites:** Admission to Food Safety & Defense certificate program; and permission**Description:** Foundational concepts relevant to protecting the food supply from intentional contamination. Section 1 addresses the nature of the policy and regulatory aspects of food defense, threats to food and agricultural systems, as well as concepts and strategies related to response and mitigation of food protection incidents. Section 2 provides an understanding of the principles required in a food defense program for a food manufacturing, warehousing, or distribution center.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 880 Advanced Food Science: Selected Topics****Credit Hours:** 2-6**Min credits per semester:** 2**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**FDST 880A Food Carbohydrates****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 880E Food Flavors****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 880L Food Lipids****Description:** n-depth discussion of: composition, quality, and chemical and physical properties and reactions of fats and oils in food systems; processing and refining of food fats and oils; manufacture of various fat and oil products; current research related to fats and oils.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 880P Food Proteins****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 896 Independent Study in Food Science and Technology****Prerequisites:** 12 hrs FDST or closely related areas**Description:** Individual or group projects in research, literature review, or extension of course work under supervision and evaluation of a departmental faculty member.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**FDST 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**FDST 908 Topics in Advanced Food Microbiology****Description:** Current topics in food microbiology.**Credit Hours:** 2-8**Min credits per semester:** 2**Max credits per semester:** 8**Max credits per degree:** 8**Format:** LEC**FDST 908A Food Biotechnology****Description:** Microbial genetics and recombinant DNA technology as applied to food science. Includes modification and improvement of microorganisms important in food fermentations; effects of bacteriophages in food fermentations; enzyme engineering; principles of plant and animal tissue culture; bioprocess engineering and down stream processing; DNA probe and monoclonal antibody technology; and regulatory and ethical aspects of biotechnology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 908B Food Borne Pathogens****Prerequisites:** FDST 805 (BIOS 845). BIOS 820, or permission. BIOC 831 and 832 recommended**Description:** Survey of current research topics in the molecular biology of agents of food borne disease. Includes structure-function analyses of toxin molecules and other virulence determinants; genetic mechanisms of phenotypic variation, coordinate regulation of virulence gene expression; mobile genetic elements that contribute to pathogenesis; invasion of host tissues; and stress-response systems and survival.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**FDST 908D Food Mycology****Description:** Food borne filamentous micro-fungi or molds. Culture media and methods. Techniques for enumerating and identifying molds belonging to the genera *Aspergillus*, *Penicillium*, *Fusarium*, *Alternaria*, *Cladosporium*, *Rhizopus*, *Mucor* and others. Food spoilage by molds, mycotoxin production and pathological effects.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC

FDST 908E Readings in Food Microbiology

Description: Primarily a literature course that focuses on current topics in food microbiology. Articles from food microbiology, as well as other applied and basic microbiology journals reviewed and discussed. Recent advances in methodology and microbiological techniques emphasized.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

FDST 908J Gastrointestinal Microbiology

Description: Introduction to the complex microbial populations that inhabit the gastrointestinal tracts of human and non-ruminant animals, and how they impact their hosts. Aspects of gut microbiota having medical or agricultural applications.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

FDST 951 Advanced Food Science Seminar

Prerequisites: Permission

Description: Advanced study and discussion of the scientific literature and research pertaining to food science.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

FDST 996 Research in Food Science and Technology

Prerequisites: 6 hrs microbiology, 12 hrs chemistry

Description: Studies and investigational work relating to chemistry, microbiology, and processing of food products.

Credit Hours: 1-8

Min credits per semester: 1

Max credits per semester: 8

Max credits per degree: 8

Format: IND

FDST 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Forensic Science (FORS)

FORS 803 Advanced Forensic Photography

Crosslisted with: FORS 403

Prerequisites: FORS 120/L or FORS 302.

Description: Advanced concepts, techniques, analysis, and interpretation of photographic evidence.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Offered: SPRING

Prerequisite for: FORS 411; FORS 804, FORS 404

FORS 804 Bloodstains as Evidence

Crosslisted with: FORS 404

Prerequisites: FORS 120/L, FORS 302 or FORS 403/803.

Description: Documentation and interpretation of geometric bloodstains, calculating probable origins, and collecting blood as a source of DNA evidence.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Offered: FALL

FORS 814 Forensic Entomology

Crosslisted with: ENTO 414, ENTO 814, FORS 414

Prerequisites: ENTO 115 or equivalent introductory course.

Description: Application of entomology to legal issues. Criminal investigations, insects of forensic importance, insect succession on carrion, and case studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FORS 815 Forensic Toxicology

Crosslisted with: FORS 415

Prerequisites: CHEM 252/254; BIOC 321 (concurrent).

Description: Provides a comprehensive understanding of the principles of toxicology, pharmacokinetics, metabolism, analytical methods and instrumentation relative to forensic science.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

FORS 820 Forensic Science and Criminal Investigation

Description: Theory and practice in forensic science. The legal system, crime scene investigation, taphonomy, and criminalistics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

FORS 845 Human Remains in Forensic Science

Crosslisted with: FORS 445, NRES 445, NRES 845

Prerequisites: LIFE 120/L and LIFE 121/L, CHEM 109, CHEM 110, and FORS 120/L.

Description: Forensic anthropology within the broader context of forensic sciences and physical anthropology. Decomposition and bone modification through artificial means. Determination of individual identity, diet, chronic pathology and cause of death from human remains.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: FALL

FORS 846 Pollen Analysis for Behavioral, Biological and Forensic Science**Crosslisted with:** FORS 446, NRES 446, NRES 846**Prerequisites:** BIOS 109 and FORS 120.**Description:** Collection, processing, identification of common North American pollen types. Pollination ecology relating to scene reconstruction. Fundamental statistics and presentation requirements for a legal and scientific audience.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**FORS 898 Special Topics in Forensic Science****Crosslisted with:** FORS 498**Prerequisites:** 3 hrs FORS or equivalent.**Description:** Current issues in forensic science.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** LEC

French (FREN)

FREN 803 Advanced Grammar**Crosslisted with:** FREN 403**Prerequisites:** FREN 303 and 304.**Description:** Detailed analysis of French syntax giving students the means to achieve greater sophistication in self-expression.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 804 French Stylistics****Crosslisted with:** FREN 404**Prerequisites:** FREN 304.**Description:** Principles of explication of texts, translation and composition in French, review of linguistic principles, for advanced students, particularly prospective teachers, who wish to acquire a more sophisticated means of expression in French.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 806 Translation****Crosslisted with:** FREN 406**Prerequisites:** FREN 303 and 304.**Description:** Principles of translation, French-English and English-French. Attention to problems of vocabulary, syntax, semantics, and technical, literary, and commercial translation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 822 Topics in French Civilization****Crosslisted with:** FREN 422**Prerequisites:** FREN 301 and 302**Description:** Analysis of interrelationships of cultural, social, economic, and political factors contributing to French culture and civilization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 841 French Literary Treasures of the Middle Ages****Crosslisted with:** FREN 441**Prerequisites:** FREN 301 and FREN 302**Description:** French medieval short story, epic, novel, farce, satire, read in modern French. May include the Song of Roland, Lais, of Marie de France, Tristan, a romance by Chrétien de Troyes such as Ecre et Enide, the satire of Aucassin et Nicolette, the farce of Pathelin, Villon's Testament.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 845 Seventeenth Century I****Crosslisted with:** FREN 445**Prerequisites:** FREN 301 and 302**Description:** The plays of Corneille, Moliere, Racine.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 846 Seventeenth Century II****Crosslisted with:** FREN 446**Prerequisites:** FREN 301 and 302**Description:** Prose and poetry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 849 Eighteenth Century I****Crosslisted with:** FREN 449**Prerequisites:** FREN 301 and 302**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Philosophical writings and the theatre of eighteenth-century France.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 850 Eighteenth Century II****Crosslisted with:** FREN 450**Prerequisites:** FREN 301 and 302**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Works of Voltaire, Rousseau, Montesquieu, Diderot. Lectures, discussion, and reports.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

FREN 853 French Literature Nineteenth Century I**Crosslisted with:** FREN 453**Prerequisites:** FREN 301 and 302**Description:** Readings in the major developments in narrative, drama, poetry and the essay from 1800 to 1860. Authors include Balzac, Hugo, Stendhal, Nerval and Gauthier.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 854 French Literature Nineteenth Century II****Crosslisted with:** FREN 454**Prerequisites:** FREN 301 and 302**Description:** Readings in the major developments in prose and verse from 1850 to 1900. Authors include Baudelaire, Mallarme, Rimbaud and Verlaine.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 857 Twentieth-Century French Literature I****Crosslisted with:** FREN 457**Prerequisites:** FREN 301 and 302**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Main trends in the French novel from 1900 to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 858 Twentieth-Century French Literature II****Crosslisted with:** FREN 458**Prerequisites:** FREN 301 and 302**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Main trends in French poetry and theater from 1900 to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 859 Literature of French Canada****Crosslisted with:** FREN 459**Prerequisites:** FREN 301 and 302**Description:** Survey of literature of French Canada in its cultural context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 860 Francophone Literature****Crosslisted with:** FREN 460**Prerequisites:** FREN 301 and 302.**Description:** Survey of literature and film from French speaking African and Caribbean cultures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 861 Studies in Francophone Literature and Cultures****Crosslisted with:** FREN 461**Prerequisites:** FREN 301 and 302.**Description:** A topic, genre, author, and geographical area of the African Diaspora.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 896 Independent Study in French****Crosslisted with:** FREN 496**Prerequisites:** Permission.**Description:** Special research project or reading program under the direction of a staff member in the department.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**FREN 898 Special Topics in French****Crosslisted with:** FREN 498**Prerequisites:** Permission.**Notes:** Specific topic to be covered in any given semester and credit to be awarded to be determined by the instructor at that time.**Description:** Language, literature, and civilization.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**FREN 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**FREN 901 Old French Language****Prerequisites:** Permission**Description:** Phonology and morphology of Old French as derived from Vulgar Latin. Attention to a detailed reading of the "Chanson de Roland" and the "Lais" of Marie de France.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 902 Old French Literature****Prerequisites:** Permission**Description:** Readings from Medieval epics, saints' lives, Arthurian romances, prose chronicles, and drama. Introduction to the modern critical principles of editing Medieval manuscript.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

FREN 919 Sixteenth Century I**Prerequisites:** Permission**Description:** Masterpieces of Renaissance literature. Works of Rabelais, the Pleiade, Montaigne, etc.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 920 Sixteenth Century II****Prerequisites:** Permission**Notes:** FREN 919 continued.**Description:** Seminars in French. The works of one author, or groups of works centering in a period, or those illustrating the development of a literary age are studied with respect to content, sources, style, and influence.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 925 Drama****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 927 Novel****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 928 Poetry****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 929 Special Topics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**FREN 996 Research Problems in French****Prerequisites:** Permission**Description:** Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis.**Credit Hours:** 1-8**Min credits per semester:** 1**Max credits per semester:** 8**Max credits per degree:** 8**Format:** IND**FREN 997 Directed Readings in French****Prerequisites:** Permission**Description:** Topic varies.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**FREN 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Geography (GEOG)

GEOG 806 Spatial and Environmental Influences in Social Systems**Crosslisted with:** GEOG 406**Description:** How space, spatial structure, and spatially oriented behavior operate in social systems, emphasizing their influence on interpersonal communication and/or social exchange.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human-Economic Geography**GEOG 808 Microclimate: The Biological Environment****Crosslisted with:** AGRO 408, GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, AGRO 808, HORT 808, METR 808, NRES 808**Prerequisites:** Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering.**Description:** Physical factors that create the biological environment.

Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGRO 907, HORT 907, METR 907, NRES 907; BSEN 954, NRES 954**Groups:** Physical Geography**GEOG 812 Introduction to Geographic Information Systems****Crosslisted with:** GEOG 412, NRES 412, NRES 812**Description:** Introduction to conceptual foundations and applications of computer-based geographic information systems (GIS). GIS database development, spatial data analysis, spatial modeling, GIS implementation and administration.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** GEOG 432, GEOG 832; GEOG 922, NRES 922**Groups:** Techniques

GEOG 814 Quantitative Methods in Geography**Crosslisted with:** GEOG 414**Prerequisites:** STAT 218 or 380 and 6 hrs of geography.**Description:** Introduction to quantitative techniques utilized in geographic research. Fundamental statistical and mathematical techniques used in analyzing spatial relationships examined.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**GEOG 815 Introduction to Computer Mapping****Crosslisted with:** GEOG 415**Prerequisites:** GEOG 317.**Description:** Introduction to the tools, techniques, and analytical uses of computer mapping. Programming necessary for producing own computer mapping programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**GEOG 817 Cartography II: Electronic Atlas Design and Production****Crosslisted with:** GEOG 417**Prerequisites:** GEOG 317.**Description:** Computer-map design and production for the purpose of assembling an environmental electronic atlas, using advanced computer hardware and software. Extensive discussions and demonstrations on content, design, and methods used in computer mapping.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**GEOG 818 Introduction to Remote Sensing****Crosslisted with:** GEOG 418, NRES 418, NRES 818**Prerequisites:** 9 hours of GEOL, NRES or GEOG.**Notes:** Advanced standing in geography, natural resources, environmental sciences, engineering or agronomy recommended.**Description:** Introduction to remote sensing of the earth from aerial and satellite platforms. Aerial photography, multispectral scanning, thermal imaging and microwave remote sensing techniques. Physical foundations of remote sensing using electromagnetic energy, energy-matter interactions, techniques employed in data acquisition and methods of image analysis. Weekly laboratory provides practical experience in visual and digital interpretation of aerial photography, satellite imagery, thermal and radar imagery. Applications in geographic, agricultural, environmental and natural resources analyses.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** GEOG 421, GEOG 821, NRES 421, NRES 821**Groups:** Techniques**GEOG 819 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** AGRO 419, GEOG 419, GEOL 419, NRES 420, AGRO 819, GEOL 819, NRES 820**Notes:** GEOG 418/NRES 418 recommended**Description:** Introduction to the practical uses of remote electromagnetic sensing in dealing with agricultural and water-resources issues.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**GEOG 820 Digital Image Analysis of Remote Sensing Data****Crosslisted with:** GEOG 420**Prerequisites:** GEOG 418/818 or 419/819.**Description:** Principles and methods of digital image processing of remotely sensed data. The biophysical basis of remote sensing and the various sensor systems typically used for monitoring terrestrial and aquatic environments. Algorithms for the preprocessing, enhancement, classification and mapping of digital data for agricultural, urban, geological, environmental, and natural resource management problems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**GEOG 821 Field Techniques in Remote Sensing****Crosslisted with:** GEOG 421, NRES 421, NRES 821**Prerequisites:** GEOG 418/818**Description:** Field techniques as they relate to remote-sensing campaigns. Research methods, systematic approaches to data collection, field spectroscopy, collecting ancillary information linked with spectroscopic data sets as well as aircraft or satellite missions and subsequent analyses of acquired data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**GEOG 822 Advanced Techniques in Geographic Information Systems****Crosslisted with:** GEOG 422**Prerequisites:** GEOG 412/812.**Description:** Vector and quadtree data structures, use of relational database management systems, topologically structured databases, query languages, digital terrain modeling, advanced data analysis methods and research issues in GIS. Extensive practical experience with the current GIS software.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** GEOG 922, NRES 922**Groups:** Techniques

GEOG 825 Scientific Visualization in Cartography**Crosslisted with:** GEOG 425**Prerequisites:** GEOG 317 and either GEOG 415 or GEOG 417.**Description:** Explores cartographic applications of computer animation and multimedia for the dual purposes of assisting visual thinking in map-oriented research and data exploration, and in communicating geographic ideas to others.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**GEOG 827 Introduction to the Global Positioning System (GPS)****Crosslisted with:** GEOG 427, NRES 427, NRES 827**Prerequisites:** Junior standing.**Notes:** Familiarity with mapping and GIS recommended.**Description:** Integrated lectures, lab exercises and field experience provide an understanding of GPS technology and applications. Students will learn to collect, correct and use GPS data in a geographic information system (GIS) environment.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**GEOG 831 Cultural Geography****Crosslisted with:** GEOG 431**Description:** The history of cultural geography from von Humboldt through Carl Sauer to the 'new' cultural geographies of Don Mitchell, Gillian Rose and Noel Castree. The current theoretical debates of feminism, post-structuralism, post-colonialism and environmentalism, and the influences of literary and cultural studies in the development of cultural geography and the various methodologies involved.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human-Economic Geography**GEOG 832 GIS Programming for Advanced Spatial Analysis and Modeling****Crosslisted with:** GEOG 432**Prerequisites:** GEOG/NRES 412/812.**Notes:** 18 hours of GIS practice may be substituted for prerequisite by permission.**Description:** Techniques for Geoprocessing script programming to customize geographic information systems (GIS), utilize GIS tools, and implement application-specific spatial analysis, modeling algorithms and procedures.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**GEOG 835 Cultural Survival: Indigenous People's Rights****Crosslisted with:** GEOG 435**Description:** Threats against indigenous peoples' lands, resources and cultural patrimony, languages and knowledge systems more than 500 years after Columbus instigated European colonialism, creating the first global world order. The responses of Indigenous peoples to the imposition of Western dominated economic and political systems. Land rights, economic development, and women's rights from the perspective of different Indigenous communities around the world.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human-Economic Geography**GEOG 844 Geo-demographic and Geographic Information Systems (GIS)****Crosslisted with:** GEOG 444**Description:** Geo-demographic and geographic information system (GIS) analysis, interpretation and mapping of geographical patterns of population size, population composition, and composition change. Theoretical and applied investigation of geo-demographic issues involving marketing research, public facilities planning, public health provision, and small-area population change forecasting. GIS use of TIGER and small-area census data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human-Economic Geography**GEOG 847 Political Geography****Crosslisted with:** GEOG 447**Description:** Importance of factors of a physical, economic, and human character in political development at local to global scales; international geopolitical aspects of environment, territoriality, core areas, capitals, and boundaries; national geographical patterns of voting, representation, public administration and public policy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human-Economic Geography**GEOG 848 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, ANTH 479, ANTH 879, ECON 866, GEOG 448, HIST 479, HIST 879, SOCI 466, SOCI 866
Prerequisites: Senior standing and permission.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations&Compar Variable group based on topic

GEOG 850 Climate and Society

Crosslisted with: AGRO 450, GEOG 450, METR 450, NRES 452, AGRO 850, METR 850, NRES 852

Prerequisites: Junior standing or above.

Notes: Offered spring semester of even-numbered calendar years.

Description: Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

Groups: Physical Geography

GEOG 861 Geospatial Approaches in Digital Humanities and Social Sciences

Crosslisted with: ANTH 461, ANTH 861, CLAS 461, CLAS 861, GEOG 461, HIST 461, HIST 861

Description: Study of geographic concepts and critical analysis of applications of Geographic Information Systems (GIS) in humanities and social sciences and application of geospatial tools for humanities and social science research; learn how to collect, manage, analyze, and visualize spatial data for real-world projects

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Techniques

GEOG 867 Great Plains Field Pedology

Crosslisted with: AGRO 477, GEOG 467, NRES 477, SOIL 477, NRES 877

Prerequisites: AGRO/SOIL 153.

Description: Spatial relationship of soil properties on various parts of landscape typical of the Plains, causal factors, and predictions of such relationships on other landscapes. Grouping these properties into classes, naming the classes, and the taxonomy that results from this grouping. Application of a taxonomy to a real situation through making a field soil survey in a region representative of the Plains border, predicting land use response of various mapped units as it affects the ecosystem, and evaluating the effectiveness of the taxonomic system used in the region surveyed.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Groups: Physical Geography

GEOG 869 Bio-Atmospheric Instrumentation

Crosslisted with: AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, HORT 807, METR 869, MSYM 869, NRES 869

Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.

Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Physical Geography

GEOG 878 Pro-seminar in Latin American Studies

Crosslisted with: ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, HIST 878, POLS 878, SOCI 878, MODL 878, EDPS 878

Prerequisites: Junior standing and permission.

Notes: Topical seminar required for all Latin American Studies majors.

Description: An interdisciplinary analysis of topical issues in Latin American Studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

Groups: Integrative Courses, Research Regional Geography Lat Am, Asian, Middle East Hist International Relations & Compar

GEOG 883 Cognitive Processes in Map Comprehension and Use

Crosslisted with: GEOG 483

Prerequisites: GEOG 317 and 417/817.

Description: How cognitive processes help individuals to comprehend the spatial circumstances or arenas they confront when carrying out their daily activities. Awareness of space, spatial knowing, formation of cognitive maps, importance of spatial images in negotiation of surroundings, and the relationship of cognitive maps to orientation and wayfinding.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Techniques

GEOG 884 Water Resources Seminar

Crosslisted with: AGRO 484, GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, AGRO 884, GEOL 884, WATS 884

Prerequisites: Junior or above standing.

Description: Seminar on current water resources research and issues in Nebraska and the region.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GEOG 891 Geography Field Tour

Crosslisted with: GEOG 491, NRES 491

Description: Group educational tours to specific sites that illustrate aspects of physical and cultural geography. Off-campus travel required.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 6

Format: FLD

Groups: Physical Geography

GEOG 897 Internship in Geography

Crosslisted with: GEOG 497

Prerequisites: Permission.

Description: Applying geographic training with on-the-job learning.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: FLD

GEOG 898 Advanced Special Problems**Crosslisted with:** GEOG 498**Notes:** Topic varies, see course description or registration guide.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**GEOG 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**GEOG 901 Pro-seminar in Research Methods and Professional Development****Description:** Development of skills required for success in completing a graduate degree and forging a career as a geographer. Setting career goals, designing a graduate program, preparing research proposals, presenting research proposals, presenting research at professional conferences, reviewing professional literature and writing articles for publication.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**GEOG 902 General Seminar****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 3**Format:** LEC**GEOG 903 History and Philosophy of Geography****Description:** History of geographical thought concentrating on the period since 1800. Emphasis on both the traditional and modern ways of viewing the nature of geography and to the linkages between them.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOG 904 Explanation in Geography****Description:** Course directly complements GEOG 903. Methodology or methods of explanation employed in geographic research and their relationship to the goals of the discipline. Problems, hypotheses, laws, theories, and models of a spatial nature.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOG 915 Seminar in Cartography****Prerequisites:** GEOG 815, 817.**Description:** Review and examination of cartographic research on map design. Primary emphasis on efficiency and accuracy of maps as devices for spatial understanding and analytical cartography.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**GEOG 922 Seminar in Geographic Information Systems (GIS)****Crosslisted with:** NRES 922**Prerequisites:** GEOG/NRES 812 and 822; or equivalent**Description:** Study of current research and trends in geographic information systems (GIS), GIScience, and GeoComputation. Advanced spatial analytical techniques and geospatial modeling emphasizing GIS applications in natural resources assessment, environmental analyses, agriculture, and land management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOG 931 Comparative Studies of the Dispossession of Indigenous Peoples****Description:** Dispossession of the indigenous peoples of Australia, Canada, New Zealand, and the United States from a historical, spatial and interdisciplinary approach. Emphasis on human rights, including topics such as the legal assumptions of colonization, reduction of land holdings, population loss, resistance, and land claims.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOG 935 Seminar in Historical Geography****Crosslisted with:** NRES 935**Description:** Discussion of current literature and research on selected aspects of historical geography. Specific theme of course varies according to instructor.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**GEOG 940 Seminar in Human Geography****Description:** Structure of settlement patterns and the factors influencing their development.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC

GEOG 983 Seminar on Behavioral Processes in Person/Environment Relations

Prerequisites: Senior-level masters degree candidate or PhD-level in human geography or design or planning or any of the social and behavioral disciplines or permission

Description: Consists of a four, participant-led, research/discussion sessions. Environments as potentially significant components of behavioral episodes based on the premise that places, settings, or environments provide the contexts for and arenas within which people act, interact, and transact. Significance of the physical/sociocultural surrounds derived not solely from their physical presence, but from them, meaning attached to them, and their importance. Topics: common importance of person/environment relations to diverse interests concerned with individual and group behavior in everyday, natural settings; how people experience their environments or "environmental knowing" through perceptual/cognitive processes; environmental representations, images, schemas, and/or cognitive "maps"; and attributions of meaning and significance to environments.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOG 994 Seminar in Anthropology and Geography

Crosslisted with: ANTH 994

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

GEOG 996 Non-thesis Research

Prerequisites: 24 hrs geography and permission

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 24

Format: IND

GEOG 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Geology (GEOL)

GEOL 812 Volcanology and Igneous Petrology

Crosslisted with: GEOL 412

Prerequisites: GEOL 210; CHEM 113

Description: The study of igneous systems, including an investigation of volcanic processes, mineral equilibria, petrography, and the geochemistry of magmas and minerals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 815 Geochemical Thermodynamics

Notes: This course requires command of material covered in MATH 107 and GEOL 201 or equivalent.

Description: Exploration of the fundamentals of geochemistry from thermodynamics, including the laws of thermodynamics, multicomponent analysis, extrapolation to temperatures and pressures of interest, nonideal solution behavior, phase diagrams, volatile fugacities, and redox reactions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 816 Isotope Geochemistry

Prerequisites: GEOL 410

Description: Behavior of stable and radiogenic isotopes in geological and cosmochemical systems. Application of isotope geochemistry to determining the age of rocks, as well as the sources of the chemical components in the rocks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 817 Organic Geochemistry

Crosslisted with: GEOL 417

Prerequisites: GEOL 410 and CHEM 251.

Description: Origin, preservation and transport of organic compounds found in the rock record. Applications of organic geochemistry to paleoclimatic and paleoenvironmental interpretations as well as discerning the origins of coal, oil and natural gas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 818 Chemistry of Natural Waters

Crosslisted with: GEOL 418, NRES 419, NRES 819, WATS 418

Prerequisites: CHEM 109 and 110, 113 and 114, or CHEM 111.

Description: Principles of water chemistry and their use in precipitation, surface water, and groundwater studies. Groundwater applications used to determine the time and source of groundwater recharge, estimate groundwater residence time, identify aquifer mineralogy, examine the degree of mixing between waters of various sources and evaluate what types of biological and chemical processes have occurred during the water's journey through the aquifer system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: GEOL 418L, GEOL 818L, NRES 419L, NRES 819L, WATS 418L; GEOL 917, NRES 917

GEOL 818L Chemistry of Natural Waters Laboratory**Crosslisted with:** GEOL 418L, NRES 419L, NRES 819L, WATS 418L**Prerequisites:** CHEM 109 and 110 or CHEM 113 and 114; GEOL 418 or parallel.**Description:** Basic laboratory techniques used to perform water analysis including various wet chemical techniques, instrument use (AA, IC, UV-Visible) and computer modeling. Techniques for sample collection and preservation, parameter estimation and chemical analysis.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**GEOL 819 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** AGRO 419, GEOG 419, GEOL 419, NRES 420, AGRO 819, GEOG 819, NRES 820**Notes:** GEOG 418/NRES 418 recommended**Description:** Introduction to the practical uses of remote electromagnetic sensing in dealing with agricultural and water-resources issues.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**GEOL 821 Carbonate Petrology****Crosslisted with:** GEOL 421**Prerequisites:** GEOL 310.**Notes:** Lab focuses on field, petrographic and geochemical methods.**Description:** Depositional settings and processes, petrography, geochemistry, diagenesis and geological significance of modern and ancient carbonate rocks and sediments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 823 Quaternary Paleoclimatology and Paleoecology****Crosslisted with:** BIOS 423, BIOS 823, GEOL 423**Prerequisites:** 12 hrs GEOL or BIOS.**Description:** Analysis and interpretation of the Quaternary period's paleoecological data. Patterns of long-term climate variation. Distribution patterns and responses of organisms and ecosystems to Quaternary environmental change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 824 Biogeochemical Cycles****Crosslisted with:** BIOS 424, BIOS 824, GEOL 424**Prerequisites:** CHEM 109 or 113; 12 hrs GEOL or BIOS.**Description:** Chemical cycling at or near the earth's surface, emphasizing interactions among the atmosphere, biosphere, geosphere and hydrosphere. Modern processes, the geological record, and human impacts on elemental cycles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 825 Geostatistics****Crosslisted with:** NRES 825**Prerequisites:** MATH 106 and STAT 218**Notes:** Offered fall semester of odd-numbered calendar years.**Description:** Practical methods for solving spatial interpolation and related estimation problems with emphasis on geostatistical methods. Introduction to applied statistical simulation and prediction in geology, hydrogeology and environmental studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 828 Stratigraphic Architecture and Sequence Stratigraphy****Prerequisites:** GEOL 310**Description:** Analysis of stratigraphic stacking patterns in sedimentary basins and sequence stratigraphic methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 830 Quantitative Methods in Paleontology****Crosslisted with:** GEOL 430**Prerequisites:** GEOL 310.**Description:** Numerical and statistical analysis of paleontological data including biometry, syn-ecology, and quantitative biostratigraphy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 831 Micro-paleontology****Crosslisted with:** GEOL 431**Prerequisites:** GEOL 310.**Description:** Morphology, classification, ecology and geological application of common fossil and extant marine, brackish, and freshwater microfossils.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 835 Vertebrate Paleontology****Crosslisted with:** GEOL 435**Prerequisites:** Permission or graduate standing.**Description:** Survey of the evolution of the vertebrates, including the geological and biological factors that influence the pattern of evolution, and laboratory study of fossil materials of the major vertebrate groups.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 836 Evolution of Cenozoic Mammals****Crosslisted with:** GEOL 436, NRES 436, NRES 836**Prerequisites:** GEOL 103.**Description:** Survey of mammalian evolution with emphasis on the origin, radiation, and phylogenetic relationships of Cenozoic fossil mammals. Overview of climatic and ecological changes affecting mammalian adaptations and hands on experience with specimens.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

GEOL 840 Tectonics**Crosslisted with:** GEOL 440**Prerequisites:** GEOL 400.**Description:** Theory of plate tectonics; tectonic controls on rock assemblages; interpretation of regional structure and tectonic history; origin and tectonic evolution of terrestrial planets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 842 Environmental Geophysics I****Crosslisted with:** GEOL 442**Prerequisites:** MATH 107; PHYS 211; GEOL 101 or 106.**Description:** Introduction to the principles of seismic, ground-penetrating radar, and bore-hole geophysical methods and their application to groundwater, engineering, environmental, and archaeological investigations.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**GEOL 843 Environmental Geophysics II****Crosslisted with:** GEOL 443**Prerequisites:** MATH 107; PHYS 211; GEOL 101 or 106.**Description:** Introduction to principles of magnetic, electromagnetic, resistivity, and gravity methods and their application to ground water, engineering, environmental, and archaeological investigations.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**GEOL 844 Geomicrobiology****Crosslisted with:** BIOS 444, BIOS 844, GEOL 444**Prerequisites:** 3 hours of BIOS or 3 hours of LIFE; 3 hours of CHEM**Description:** Lectures and discussions of primary literature regarding microorganisms and their role transforming Earth through geologic time.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 845 Advanced Geophysics****Crosslisted with:** GEOL 445**Prerequisites:** GEOL 344**Description:** Integrative analysis of geophysical data (gravity, magnetics, seismic) with geological information (well logs, tectonic history, etc.)**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 846 Exploration Geophysics****Crosslisted with:** GEOL 446**Prerequisites:** GEOL485/885**Description:** Geophysical methods used for petroleum exploration: potential fields, seismology, electrical and electromagnetic surveying.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 850 Surficial Processes and Landscape Evolution****Crosslisted with:** GEOL 450**Prerequisites:** GEOL 310.**Description:** Fluvial, glacial, eolian, and coastal processes and landforms. Roles of tectonics, climate, and climate change in landscape evolution. Lab stresses description and interpretation of landforms from remotely-sensed, cartographic, and field data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** GEOL 465, GEOL 865, NRES 465, NRES 865**GEOL 857 Ecosystem Ecology****Crosslisted with:** BIOS 457, BIOS 857, GEOL 457**Prerequisites:** BIOS 207 and CHEM 110 and Senior standing.**Description:** Processes controlling the cycling of energy and elements in ecosystems and how both plant and animal species influence them. Human-influenced global and local changes that alter these cycles and ecosystem functioning.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BSEN 954, NRES 954**GEOL 861 Soil Physics****Crosslisted with:** AGRO 461, GEOL 461, NRES 461, SOIL 461, WATS 461, AGRO 861, NRES 861**Prerequisites:** AGRO/SOIL 153; PHYS 141 or equivalent, one semester of calculus.**Description:** Principles of soil physics. Movement of water, air, heat, and solutes in soils. Water retention and movement, including infiltration and field water regime. Movement of chemicals in soils.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 955, AGRO 955, CIVE 955, GEOL 985**GEOL 865 Soil Geomorphology and Paleopedology****Crosslisted with:** GEOL 465, NRES 465, NRES 865**Prerequisites:** GEOL 450/850 and NRES 477/877.**Description:** Soils and paleosols as evidence in reconstruction landscape evolution and paleoenvironments. Role of paleosols in stratigraphy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 870 Field Techniques in Hydrogeology****Crosslisted with:** GEOL 470**Prerequisites:** GEOL 488/888.**Description:** Basic techniques, field procedures, instruments, and software for data interpretation, and characterization of groundwater flow and contaminant transport.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

GEOL 872 Water in Geosciences**Crosslisted with:** GEOL 472**Prerequisites:** MATH 106 and 107; PHYS 141; and one of the following: GEOL 101 or 106 or METR 100.**Description:** Quantitative approach to water in geological media, earth surface and atmosphere. Understanding and analysis of physical processes involved in groundwater-surface-atmosphere interactions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, MSYM 475, MSYM 875, POLS 475, POLS 875**Prerequisites:** Senior standing.**Notes:** Capstone course.**Description:** Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**GEOL 880 Economic Geology of the Metals****Crosslisted with:** GEOL 480**Prerequisites:** GEOL 400; CHEM 114, 221.**Description:** Occurrence and utilization of the metallic ores. Elementary theory of ore genesis.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**GEOL 884 Water Resources Seminar****Crosslisted with:** AGRO 484, GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, AGRO 884, GEOG 884, WATS 884**Prerequisites:** Junior or above standing.**Description:** Seminar on current water resources research and issues in Nebraska and the region.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**GEOL 885 Fossil Fuel Geology and Exploration****Crosslisted with:** GEOL 485**Prerequisites:** GEOL 310.**Description:** Geology of coal, oil and gas, and methods of exploration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** GEOL 446, GEOL 846**GEOL 888 Groundwater Geology****Crosslisted with:** GEOL 488, NRES 488, NRES 888**Prerequisites:** GEOL 100-level course; MATH 106 or equivalent.**Description:** Occurrence, movement, and development of water in the geologic environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 955, AGRO 955, CIVE 955, GEOL 985; GEOL 889, NRES 887; NRES 918**GEOL 889 Hydrogeology****Crosslisted with:** NRES 887**Prerequisites:** GEOL 888/NRES 488 and MATH 208**Description:** Principles of flow through porous media with emphasis on basic classical solutions, flow-net analysis, and elementary modern numerical solutions that aid in the analysis and development of groundwater supplies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NRES 918**GEOL 895 Economic and Exploration Geology****Crosslisted with:** GEOL 495**Prerequisites:** GEOL 310.**Notes:** A required parallel course will be indicated by the instructor. Field trips which are required and supported by alumni endowment may be scheduled during semester breaks. Course content will vary on a 3-year rotational basis. Combined lectures, seminars, weekend short courses, and field trips.**Description:** E.F. Schramm Course in Economic Geology. Aspects of fossil fuel geology and exploration.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**GEOL 917 Environmental Isotope Hydrology****Crosslisted with:** NRES 917**Prerequisites:** NRES 819.**Description:** Theory and use of stable, radiogenic and radioactive isotopes in hydrologic studies. Abundance and variation of the stable isotopes of oxygen, hydrogen, carbon, sulphur, chlorine, nitrogen, and strontium. Application of the isotopes to determine water origin, movement, geochemical history, recharge age and residence time, and to delineate contaminant sources and solute migration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 918 Seminar in Geochemistry****Description:** Seminar in the study of geochemistry. Topics will vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

GEOL 919 Seminar in Mineralogy and Petrology

Description: Advanced seminar on the study of mineralogy and petrology. Topics will vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

GEOL 920 Seminar in Stratigraphy

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 921 Sedimentary Petrography and Diagenesis

Description: Study of sedimentary rocks under the microscope, including origin, composition, texture, and diagenesis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 922 Seminar in Sedimentary Environments

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 925 Seminar in Sedimentology

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 926 Marine Geology and Paleooceanography

Description: Geology of the oceanic realm, formation of oceanic crust, circulation, geochemistry, pelagic sediments and their diagenesis, correlation, and oceanic history.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 929 Mesozoic and Cenozoic Stratigraphy

Description: Application of stratigraphic principles and methods to the solution of Mesozoic and Cenozoic problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GEOL 935 Cenozoic Vertebrate Paleoecology

Prerequisites: GEOL 836

Description: Terrestrial vertebrate history during the Cenozoic Era with emphasis on the fossil record of Great Plains mammalian communities within the last fifteen million years.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 936 Siliceous Phytoplankton Paleontology

Description: Biostratigraphy, paleoecology, and paleobiogeography of fossil diatoms, silicoflagellates and ebridians.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

GEOL 937 Mesozoic Calcareous Nannofossil Paleontology

Description: Biostratigraphy, paleoecology, and paleobiogeography of Mesozoic calcareous nannofossils.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

GEOL 938 Cenozoic Calcareous Microfossil Paleontology

Description: Biostratigraphy, paleoecology, and paleobiogeography of Cenozoic calcareous nannofossils.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

GEOL 939 Seminar in Paleontology

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 940 Advanced Structural Geology

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

GEOL 945 Seminar in Structural Geology and Tectonics

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 956 Seminar in Quaternary Geology

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOL 957 Modeling Vadose Zone Hydrology**Crosslisted with:** AGEN 957, BSEN 957, CIVE 957**Prerequisites:** MATH 221/821 or equivalent. AGEN/BSEN 350 or NRES 453/853 or equivalent.**Notes:** Typically offered spring semester in even years.**Description:** Principles and modeling of fluid flow and solute transport in the vadose zone. Topics include hydraulic properties of variably saturated media, application of Darcy's Law in variably saturated media, hydrologic and transport processes in the vadose zone, and solution of steady and unsteady flow problems using numerical techniques including finite element methods. Contemporary vadose zone models will be applied to engineering flow and transport problems. Review and synthesis of classic and contemporary research literature on vadose zone hydrology will be embedded in the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**GEOL 985 Solute Movement in Soils****Crosslisted with:** AGEN 955, AGRO 955, CIVE 955**Prerequisites:** MATH 208; AGRO 861 or GEOL 888 or MSYM 852 or CIVE 858**Description:** Examination of the theory and experimental evidence available to characterize the movement of chemicals in soil. Both saturated and unsaturated flow conditions examined. Initial presentation of basic theoretical concepts. Remainder of class a discussion of the literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 986 Contaminant Hydrogeology****Prerequisites:** GEOL 888, MATH 208.**Description:** Occurrence, behavior and remediation of contamination in geological media. Fundamentals of physical, mathematical, chemical, and engineering processes affecting movement of contaminants in the hydrogeological environment and their applications. Teamwork, projects, seminar presentations, field trips and invited lectures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOL 987 Seminar in Hydrogeology****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**GEOL 988 Introduction to Groundwater Modeling****Prerequisites:** GEOL 889, MATH 208 or equivalent, programming language.**Description:** Application of fundamentals of modeling techniques (analytical, semi-analytical, finite-difference and finite elements) to the solution of hydrogeological problems. Emphasis on development of model concepts for specific groundwater flow and transport conditions, selection of solution methods, including computer software and hardware, performance of computer modeling, and interpretation of results.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Geosciences (GEOS)

GEOS 810 Teaching & Learning in Post-Secondary Science Education**Prerequisites:** One semester of teaching a college level science, technology, engineering, or mathematics course.**Notes:** This course is designed for graduate students, postdoctoral researchers, and others who teach at the college level. Students may seek permission from instructor to enroll in the course concurrent with their first semester of teaching.**Description:** Integrate learning theories, pedagogy, and evidence-based practices to promote student learning in science, technology, engineering, and mathematics (STEM) courses in post-secondary education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GEOS 811 STEM Education Seminar****Crosslisted with:** NRES 841**Prerequisites:** Graduate student in a science, technology, engineering, or mathematics (STEM) discipline**Notes:** This seminar is designed for graduate students interested in STEM education in formal or informal environments with children or adult learners.**Description:** Acquire familiarity with the broad range of current STEM education research, outreach, and other activities taking place at UNL and across the nation in order to build a larger context for and connections to one's own STEM research and activities.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** RCT**GEOS 898 Special Problems in Geosciences****Prerequisites:** 12 hours geosciences**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** LEC

GEOS 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

GEOS 900 Professional Development in Geosciences

Description: Professional skills. Time management, laboratory and field safety, abstract writing, proposal writing, grantsmanship, and presentations. The philosophy and ethical conduct of science.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

GEOS 996 Research Other Than Thesis

Prerequisites: Permission

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

GEOS 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

German (GERM)

GERM 803 Advanced Syntax and Stylistics in German I

Crosslisted with: GERM 403

Prerequisites: One of GERM 301, 302, 303 or 304.

Notes: Recommended for all German majors. See instructor if you believe an equivalent course(s) may count for prerequisite.

Description: Advanced syntax and style in their application to composition.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 804 Advanced Syntax and Stylistics in German II

Crosslisted with: GERM 404

Prerequisites: One of GERM 301, 302, 303 or 304.

Notes: Recommended for all German majors. See instructor if you believe an equivalent course(s) may count for prerequisite.

Description: Advanced syntax and style in their application to composition.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 805 Linguistics in German

Crosslisted with: GERM 405

Prerequisites: One of GERM 301, 302, 303 or 304.

Notes: See instructor if you believe an equivalent course(s) may count for prerequisite.

Description: Phonetics, phonemics, morphology, and transformational grammar as applied to standard German.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 807 History of the German Language

Crosslisted with: GERM 407

Prerequisites: One of GERM 301, 302, 303 or 304.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 809 Morphemics in German

Prerequisites: Permission

Description: Morphemic theory and its application to modern German.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 810 Applied Linguistics in German

Prerequisites: GERM 805 or permission

Notes: Recommended for graduate students in German.

Description: Application of linguistic theory to teaching or learning German as a second language.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 842 Survey of Medieval German Literature in Translation

Crosslisted with: GERM 442, MODL 442, MODL 842

Prerequisites: Permission.

Notes: German majors expected to read the works in German translation and to write their papers in German. Non-German majors read the works in English translation.

Description: Development of German vernacular literature during the Middle Ages. Include works that represent the philosophical/religious literature, the heroic epic, and the romance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERM 843 Middle High German Language

Crosslisted with: GERM 443

Prerequisites: One of GERM 301, 302, 303 or 304.

Description: Grammar to attain reading knowledge of Middle High German/translation of excerpts from a variety of Middle High German texts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: GERM 444, GERM 844

GERM 844 Middle High German Literature**Crosslisted with:** GERM 444**Prerequisites:** GERM 443 / 843.**Notes:** See instructor to enroll without prerequisites if you already have reading knowledge of Middle High German.**Description:** Reading of masterworks of Middle High German literature in the original language.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 845 Sixteenth- and Seventeenth-Century German Literature****Crosslisted with:** GERM 445**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Humanism, Reformation, and Baroque.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 847 Eighteenth-Century Literature****Crosslisted with:** GERM 447**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Representative authors of the Enlightenment, Empfindsamkeit, and Storm and Stress.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 848 Romanticism****Crosslisted with:** GERM 448**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Representative authors of the Romantic movement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 849 Survey of Nineteenth-Century German Literature I, 1820-1848****Crosslisted with:** GERM 449**Prerequisites:** One of GERM 301, 302, 303 or 304.**Description:** A survey of the major literary currents, authors, works, influences in German-speaking countries in the first half of the nineteenth century, excluding Romanticism, which is treated in GERM 448/848. The main concern of the course will be a careful examination of many aspects of "Biedermeier" and "Das Junge Deutschland," the two major movements of the time.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 850 Survey of Nineteenth-Century German Literature II, 1848-1900****Crosslisted with:** GERM 450**Prerequisites:** One of GERM 301, 302, 303 or 304.**Description:** A survey of the major literary currents, authors, works, influences in German-speaking countries in the second half of the nineteenth century. The main concern of the course will be a careful examination of Poetic Realism and Naturalism, the two major movements in this half of the century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 851 From Naturalism to Expressionism****Crosslisted with:** GERM 451**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Critical survey of the major literary currents from the turn of the century to the end of World War I.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 852 From the Weimar Republic into Exile****Crosslisted with:** GERM 452**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Critical survey of German literature from 1918 to 1945.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 853 History of German Poetry****Crosslisted with:** GERM 453**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Critical survey of the development of epic and lyric poetry from the beginning to the present time.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 854 German Literature and Philosophy****Crosslisted with:** GERM 454**Prerequisites:** GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Relationship between literature and contemporary thought from the eighteenth century to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

GERM 855 Postwar German Literature: The Literature of West Germany, Austria, and Switzerland**Crosslisted with:** GERM 455**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Critical survey of major literary currents in the West since 1945.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 859 Works of Goethe and Schiller****Crosslisted with:** GERM 459**Prerequisites:** One of GERM 301, 302, 303 or 304.**Notes:** See instructor if you believe an equivalent course(s) may count for prerequisite.**Description:** Representative works.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 860 The Faust Tradition****Crosslisted with:** GERM 460**Description:** Critical study. Lectures, assigned readings, and reports.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 898 Special Topics in German****Crosslisted with:** GERM 498**Prerequisites:** Permission.**Notes:** Specific topic to be covered in any given semester and credit to be awarded to be determined by the instructor at that time.**Description:** Consideration of topics in the area of language, literature, and civilization.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**GERM 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**GERM 929 Problems in Advanced Linguistics****Prerequisites:** GERM 807 or permission**Description:** Training in descriptive, comparative, and historical linguistics.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 930 Seminar in German Linguistics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 951 Seminar in German Literature I****Prerequisites:** Permission**Description:** The classical period, Klopstock, Wieland, Lessing, Herder, Schiller, Goethe. Subject to be selected.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**GERM 952 Seminar in German Literature II****Prerequisites:** Permission**Description:** Tendencies of German literature during the last 50 years.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**GERM 985 Readings and Problems in German and Central European History****Crosslisted with:** HIST 985**Description:** Examines recent and classic scholarship on German and Central European History. Covers different periods, topics, and regions depending on professor's expertise. Letter grade only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERM 996 Research Problems in German****Prerequisites:** Permission**Description:** Individual research projects on a literary or philological problem in areas not covered by seminars or thesis.**Credit Hours:** 1-8**Min credits per semester:** 1**Max credits per semester:** 8**Max credits per degree:** 8**Format:** IND**GERM 997 Directed Readings in German****Prerequisites:** Permission**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**GERM 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Gerontology (GERO)

GERO 810 Educational Gerontology

Crosslisted with: GERO 410

Description: Introduction to the field of education for and about the aging. Institutions and processes of education will be analyzed to determine their relationships and value to persons who are now old and those who are aging.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 835 Issues in Aging

Crosslisted with: GERO 432

Prerequisites: Junior or senior standing.

Description: For students in gerontology and in other fields who are interested in a humanistic approach to understanding significant issues which affect the lives of older people.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

GERO 842 Recreation Therapy: Intervention for the Aging

Crosslisted with: GERO 442

Description: Role of leisure services as related to understanding and working with elders. Emphasis on recreation programming as a mode of intervention. Analysis and study of the phases of aging, with reference to psychomotor, affective, and cognitive changes; introduction to the theories of aging and how they relate to the lifestyle of this population; recreational therapy intervention, activity adaptation and program design; leisure education and issues and trends.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 846 Psychology of Adult Development and Aging

Crosslisted with: GERO 446, PSYC 446

Prerequisites: PSYC 181 or GERO 200.

Description: Major social and psychological changes that occur as a function of aging. Both normal and abnormal patterns of developmental change including their implications for behavior.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 847 Mental Health and Aging

Crosslisted with: GERO 447

Prerequisites: Junior or senior standing.

Description: Mental health needs of older adults. Identifying both positive mental health and pathological conditions. Treatment interventions effective with older adults and their families.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 850 Legal Aspects of Aging

Crosslisted with: GERO 450

Description: Consideration of the legal concerns which are likely to arise as people age. Includes introduction to the American legal system and emphasis on underlying legal concepts and issues of special importance to older persons.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 851 Long-term Care Administration

Crosslisted with: GERO 451

Description: Investigation of the broad range of policy issues, theoretical concerns, and practical management strategies influencing the design, organization, and delivery of long-term care services.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 852 Senior Housing

Crosslisted with: GERO 452

Prerequisites: Junior/Senior Standing

Description: Provides an in-depth understanding of the various housing options available to older adults including aging in place to hospice. Gain a working knowledge of the needs of older adults and how this is used in making decisions about housing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 855 Health Aspects of Aging

Crosslisted with: GERO 455

Description: Psychological, sociological, and physiological factors that influence the health of the aging, with particular emphasis given to biological changes that have implications for disease and health disorders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 859 Disorders of Communication in Older Adults

Crosslisted with: GERO 459

Description: Familiarizes the student with the identification and symptomology, basic assessment and intervention strategies associated with disorders of communication affecting older adults and geriatric patients. Beneficial to students majoring in gerontology, or speech pathology, as an elective course, or as a professional enrichment course for persons working in these or related fields.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 867 Programs and Services for the Elderly**Crosslisted with:** GERO 467**Prerequisites:** Junior or senior standing.**Description:** Historical overview of programs for the elderly, to examine the national policy process as it relates to the older American, and to review the principles and practices relative to the existing national programs for the aged.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERO 869 Working with Minority Elderly****Crosslisted with:** GERO 469, SOCW 404**Prerequisites:** Junior or senior in gerontology or social work.**Description:** Interdisciplinary course designed to provide the student with knowledge of the differing status, attitudes, and experiences of the elderly within four major minority groups and to examine various service systems and practice models in terms of their relevance and effectiveness in meeting needs of minority elderly.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERO 872 Baby Boomers and 21st century****Crosslisted with:** GERO 472**Description:** Marketing decisions and strategies apply to all businesses and are influenced by the target market. The economic realities and the character of America will change due to shifting demographics of baby boomers. Businesses that understand the power of the baby boomers will succeed; failure to understand that power may lead to economic consequences. Students from many disciplines will benefit from this cross-referenced course blending the realities of gerontology with the predictions of baby boomer behavior and the resulting impact to all businesses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**GERO 875 Mid-life Career Change and Pre-Retirement****Crosslisted with:** GERO 475**Description:** Examination of mid-life as it applies to the concept of second careers, existing resources, and the future of second careers; and the concept and practical implications of preretirement planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERO 885 Hospice and Other Services for the Dying Patient/Family****Crosslisted with:** GERO 485, SOCW 485**Description:** Designed to involve students in the recognition of fears, concerns, and needs of dying patients and their families by examining the hospice concept and other services available in our community. Factual information, readings, professional presentations, films, and experiential exercises are offered to aid the student in understanding that hospice is an alternative to the traditional medical model so that when the "cure" system is no longer functional, then the "care" system, hospice, can be offered.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERO 892 Special Studies in Gerontology****Crosslisted with:** GERO 492**Description:** Special studies designed around the interests and needs of the individual student in such areas as the psychology, sociology, economics, or politics of aging, as well as operation of various service systems. May be either a literature review project or a field project in which experience is gained in the community identifying and analyzing needs and services related to older people.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**GERO 894 Practicum****Crosslisted with:** GERO 494**Prerequisites:** 9 hrs gerontology and permission.**Description:** Opportunity for students to share field experiences; to obtain guidance concerning various relationships with agency, staff, and clients; and to develop a broadly based perspective of the field of aging.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** FLD**GERO 898 Counseling Skills in Gerontology****Crosslisted with:** GERO 498**Prerequisites:** Junior or senior standing.**Description:** Develops basic counseling skills for application in gerontology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GERO 899 Masters Thesis****Prerequisites:** Permission**Description:** The thesis is written under the supervision of the thesis adviser and the thesis committee. Independent research project required of all students working toward the master of arts degree.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 99**Format:** IND

GERO 902 Graduate Seminar in Statistical Applications

Description: Provides an introduction to statistical methods and data management used in the social, behavioral and health sciences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 911 Applied Social Gerontology

Description: Restricted to graduate students only; required of gerontology students. Social gerontology with an emphasis on the interplay between social, psychological and physical elements in later life.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 946 Aging and Human Behavior

Description: Intended primarily for graduate students in psychology and gerontology. Age-related changes in psychological processes and the implications of these changes for behavior.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GERO 956 Seminar: The Older Woman

Description: This course is designed to provide students with a critical understanding of older women. Primary focus will be directed towards an exploration of lifestyles, needs and interests of women in the later half of life. Reading and discussion of current literature will provide a basis for continued exploration through the preparation, administration and analysis of a group research project.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Graduate Business Administration (GRBA)

GRBA 98 MBA Assessment

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Format: IND

GRBA 99 MA, MS, and PHD Assessment

Prerequisites: Admission to the MA, MS, and/or PhD in Business program

Notes: GRBA 99 is required of all students graduating with an MA, MS, and/or PhD business degree. All components of GRBA 99 are offered on Blackboard. GRBA 99 is 'Pass/No Pass only.'

Description: Complete the graduate exit survey, employment survey, and other activities related to assessment.

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Format: IND

GRBA 800 Ethical and Legal Considerations in Management

Prerequisites: Permission of the MBA director

Description: Introduction to the Legal System; Introduction to Legislation and Impact on Business-State; Evolution of Concepts in Law; Introduction to Legislation and Impact on Business-Federal; Other Developing Legal Concepts; White Collar Crimes; Relationship of Business and Government-Concept of "Public Interest"; The Corporation-A Legal Perspective; Business and Ethics; Business and Religion; International Business Ethics; The "Professional Manager" in Business.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 801 Survey of Accounting

Prerequisites: Permission of the MBA director

Description: A one-semester course for graduate students without prior study in financial and managerial accounting. Common Body of Knowledge materials as described by the American Assembly of Collegiate Schools of Business. Concepts essential to thorough understanding of managerial and business concepts and practices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 802 RAIK: DSGN STUDIO I

Crosslisted with: RAIK 802

Prerequisites: Admission to the MBA program; BSAD/CSCE/RAIK 402H

Description: The first semester of a two semester sequence of the Raikes School of Computer Science and Management Graduate Design Studio. Application of software design principles in a team oriented project management setting. Complete projects in consultation with private and public sector clients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 803 Raikes School: Design Studio II

Crosslisted with: RAIK 803

Prerequisites: Admission to the MBA program; GRBA/RAIK 802

Description: The second semester of a two semester sequence of the Raikes School of Computer Science and Management Graduate Design Studio. Application of software design principles in a team oriented project management setting. Complete projects in consultation with private and public sector clients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 804 Finance

Prerequisites: Permission of the MBA director

Description: Foundation for studying advanced financial principles at the graduate level. Efficient resource utilization and associated costs. Portfolio theory, capital asset pricing model (CAPM), advanced budgeting techniques, cost of capital theory, financial forecasting, and financial planning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 805 Marketing Management**Prerequisites:** Permission of the MBA director**Description:** Examination of marketing system, its relations with the socioeconomic system, and the influences of each upon the other as these elements affect the management of marketing activities. Trends in the structure of marketing institutions, processes and practices. Consideration of customer attributes and behavioral characteristics, and how a marketing manager responds to these in the design of marketing strategies, using research, product development, pricing, distribution structure, and promotion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 806 Management Theory and Organizational Behavior****Prerequisites:** Permission of the MBA director**Description:** Behavioral science foundations of management theory. Techniques of human resource administration and utilization explored with particular emphasis on the behavioral science rationale for the application of these techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 808 Introduction to Business Strategy****Prerequisites:** Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director.**Description:** Improve the student's ability to think strategically and to provide an intellectual framework that enhances understanding of the MBA program. Making sense of corporate complexity and market uncertainty to derive a competitive firm strategy; why firms choose to compete in certain businesses; which business strategies are successful in which environments; and how firms can change in response to dynamic environments. An overarching model for strategic formulation and implementation is developed to facilitate an integrated understanding of the courses that comprise the MBA curriculum. Readings and lectures illustrate strategic management theories and frameworks while case discussions and projects provide opportunities for application.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 809 Financial Accounting****Prerequisites:** Admission to the MBA, MABA, MAIAA or MEM program or permission of the MBA Director**Notes:** GRBA809 is not open to Masters of Professional Accountancy (MPA) students.**Description:** Basics of financial accounting and reporting. The construction of financial statements and their interpretation for internal and external users of financial information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 810 Contemporary Managerial Accounting****Prerequisites:** Admission to the MBA, MABA, MAIAA or MEM program or permission of the MBA Director**Description:** Internal accounting as a tool to generate information for managerial planning and control. Problems and case material used to review basic financial accounting, to develop operational understanding of elementary cost systems, capital and operating budgeting concepts, incremental analysis, transfer pricing, performance evaluation, and other selected quantitative techniques available to assist management in the performance of the planning and control functions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 811 Managerial Finance****Prerequisites:** Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director**Description:** A case course designed to meet the financial core requirement in the MBA program. Application of financial theory to business problems. Financial statement analysis, working capital management, capital structure planning, cost of capital, and capital expenditure analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** FINA 850; FINA 862; FINA 863**GRBA 812 Managerial Economics****Prerequisites:** Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director**Description:** Applies economics to problems faced by managers in both the private and public sector. Consideration is given to the impact of the economic environment on decisions made by the firm including the effects of legal, regulatory and social constraints. Internal allocation of resources in organizations from an economic perspective. Economic tools that aid managers, including statistical analysis, are applied to practical decisions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**GRBA 813 Managerial Marketing****Prerequisites:** Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director**Description:** Mixture of case discussions, readings, lectures, plus written and oral assignments. Development of analytical and decision making skills, and an understanding of the market forces which influence those decisions. Major emphasis on the decision areas of product, distribution, personal selling, advertising and pricing, as well as on the development of integrated marketing programs. Social, ethical, and global issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ABUS 855, MRKT 855; MRKT 821; MRKT 824, SRAM 824; MRKT 830; MRKT 835; MRKT 898

GRBA 814 Applied Organizational Behavior

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Critical behavioral science theories that contribute to the effective management of human behavior in organizations. Conceptual frameworks that help diagnose and explain the potential for common interpersonal problems. These models serve as the foundation for student efforts to develop behavioral skills and intervention techniques that promote effective individual and team activity leading to positive managerial experiences. Communication, power and influence, conflict management, and perception.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 815 Supply Chain Management Strategies

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Strategic implications for the management and coordination of supply chains, including both internal and external operations and the information systems necessary for support. Relationships between operations and information systems and other functional areas of organizations, e.g., accounting, marketing, finance, and engineering/R&D are evaluated, along with relationships with other organizations in the supply chain, are emphasized.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SCMA 832; SCMA 833; SCMA 834; SCMA 839; SCMA 844; SCMA 847

GRBA 816 Strategic Human Resource Management

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Development of an understanding of how human resource decisions, strategies, and practices contribute to business performance and a firm's competitive advantage. The Approach to human resource management from a strategic perspective, as it focuses on the relationship between HRM practices and business performance. A general management perspective by focusing on the role of managers and how they can execute effective and ethical human resource practices that support strategic objectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 840 Financial Management and Economics of Sports

Prerequisites: Admission to the M.A. in Business, Intercollegiate Athletics Administration Specialization or permission from the MBA Director

Description: An introduction to the financial and economic principles relevant to the intercollegiate athletic environment. Examination of the economic factors that influence the delivery of collegiate sport products. Study of the revenue streams and costs applicable to NCAA institutions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 851 Business Analytics

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Broad understanding and knowledge of important business analytic topics and how they can be used to support decision making in all business areas, government, education, and agriculture. Emphasis will be placed on the technical procedures that are used to describe, predict and prescribe data into information for decision making. Students will learn how data exploration results in a sequence of descriptive, predictive and prescriptive processes to result in unique and new information on which decisions can be made.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MRKT 845; MRKT 850; SCMA 851; SCMA 852; SCMA 853; SCMA 854; SCMA 855

GRBA 852 International Business

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Reconsideration of marketing, management, accounting, and financial concepts within and between foreign environments. Understanding of alternative cultural, economic, and political systems which affect the operations of business firms. Attention to functional business decision making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 853 Strategic Management and Business Policy

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA program or permission of the MBA Director

Description: Development and implementation of corporate strategies and policies. Interrelationships between the external and internal environments of the organization (including functional areas) are stressed through identification, analysis, and implementation of solutions to strategic situations facing varying types of organizations. Policy cases, live cases/industry analyses, and an executive-level simulation game. Bridging the gap between management theory and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 860 Management: Theory, Issues and Practice

Prerequisites: Admission to the MBA program and/or permission of the MBA director

Description: Historical background, various approaches to management, and the functions, roles, and activities of the modern manager within the organizational and environmental context. Contemporary issues such as total quality management, employee productivity, and international management. The theme and perspective is how to make the practice of management of today's organizations more effective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

GRBA 890 Administrative Internship

Prerequisites: Admission to the MBA program and/or permission of the MBA director; and the permission of a graduate faculty member.

Notes: Maximum of 6 semester hours of GRBA 890 can be counted towards a graduate degree. Students present oral and written reports to faculty seminar once a semester.

Description: Independent study of theories, principles, practices, techniques, and strategies utilized in the business field. Practical experience in managerial, administrative situations.

Credit Hours: 6.00

Max credits per semester: 6

Max credits per degree: 6

Format: IND

GRBA 896 Directed Readings or Research in Business

Prerequisites: Admission to the MBA or MPA program and/or permission of the MBA director; and the permission of a graduate faculty member

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 24

Format: IND

GRBA 898 Managerial Skills Seminar

Prerequisites: Admission to the MBA, MPA, MABA, MAIAA or MEM program or permission of the MBA Director

Description: Seminar in current topics in business. Topical issues such as diversity, ethics, leadership, business communication, etc. New topics announced prior to each term in which the course is being offered.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Graduate College (GRDC)

GRDC 98 Responsible Research Training

Notes: Pass/No Pass only.

Description: Web-based course providing didactic training in the Responsible Conduct of Research (RCR) designed to meet the RCR training requirement specified by the National Science Foundation and specific programs at the National Institutes of Health.

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Format: LEC

GRDC 900A Future Faculty I

Description: First course in a two-semester Preparing Future Faculty Program introducing advanced graduate students to various faculty roles. Seminar participants interact with faculty from surrounding campuses, prepare teaching portfolios, present job talks, and engage in mock interviews. They discuss teaching and research expectations, tenure and promotion standards, campus life, and faculty governance at different types of colleges and universities.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GRDC 900B Future Faculty II

Prerequisites: GRDC 900A

Notes: P/N. Second course in a two-semester Preparing Future Faculty Program introducing advanced graduate students to various faculty roles.

Description: Seminar participants interact with faculty from surrounding campuses, prepare teaching portfolios, present job talks, and engage in mock interviews. They discuss teaching and research expectations, tenure and promotion standards, campus life, and faculty governance at different types of colleges and universities.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GRDC 900D Future Faculty III

Prerequisites: GRDC 900A and 900B

Notes: P/N only. Third course in a three-semester sequence, Preparing Future Faculty program that introduces advanced graduate students to various faculty roles and to the use of technology in college instruction.

Description: Participants develop instructional technology applications and are mentored in the delivery of distance education.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GRDC 901 Professional Ethics

Prerequisites: Permission

Description: Major ethical issues in the conduct of research and teaching, Topics identified by the National Academy of Science as critical to responsible research: the acquisition and maintenance of research data, including issues of informed consent and rules about safety and animal use; responsible reporting of research, including authorship issues, duplicate and fragmented publication, and reporting in the public media; peer review, including issues of confidentiality and conflict of interest; and the ethical training and supervision of students, including the assignment of mentors, appropriate supervision and fair performance evaluation, and the avoidance of exploitation.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GRDC 902 Grant Writing and Grant Management

Prerequisites: Permission

Notes: P/N only.

Description: Tips for writing successful grants, for identifying funding sources, and for making effective use of program officers. Core issues in grant management, including issues related to IRB review and approval, development of a budget and matching fund requests, and reporting responsibilities. Students develop and refine a submittable dissertation research proposal.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

GRDC 903 Professional Development Seminar**Prerequisites:** Permission**Notes:** P/N only.**Description:** Insights in developing professional careers through invited lectures and colloquia. Finding a mentor and negotiating a graduate program, the scholarly publication process, developing professional networks, building and working in interdisciplinary teams, applying for jobs, university and industry collaborations, and developing a research and teaching program. Career concerns of students from groups under-represented in their field of study and to students interested in pursuing careers outside of the academy.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

Great Plains Study Program (GPSP)

GPSP 895 Internship**Crosslisted with:** GPSP 495**Prerequisites:** Junior or senior standing; and permission.**Notes:** P/N only.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**GPSP 991 Readings and Problems in the History of the North American West****Crosslisted with:** HIST 991**Description:** History of the North American West with special attention to Great Plains. Past and present historiography; modern themes and methodologies; and topical and comparative historical treatments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Greek (GREK)

GREK 891 Topics in Greek Prose**Crosslisted with:** GREK 491**Description:** Readings from Greek prose masterpieces, Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**GREK 892 Topics in Greek Poetry****Crosslisted with:** GREK 492**Description:** Readings from Greek verse masterpieces, Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**GREK 896 Reading and Research****Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**GREK 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**GREK 961 Seminar in Greek Literature****Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

Hebrew (HEBR)

HEBR 896 Readings and Research**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND

History (HIST)

HIST 802 Sexuality in Nineteenth and Twentieth Century America**Crosslisted with:** HIST 402, WMNS 402, WMNS 802**Description:** Sexual practices and ideologies in American history from the 1800's to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 803 United States Military History, 1607-1917****Crosslisted with:** HIST 303**Prerequisites:** Sophomore, junior, or senior standing.**Notes:** This course satisfies the military history requirement of the advanced program.**Description:** Significance of military affairs in the context of American political, economic, and social history from the formation of the earliest colonial militias to the pre-WWI preparedness movement. Discusses all of the major wars of this period but also emphasizes such themes as the professionalization of the officer corps, the relationship between war and technology, and civil-military relations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist

HIST 804 United States Military History Since 1917**Crosslisted with:** HIST 304**Prerequisites:** Sophomore, junior, or senior standing.**Notes:** This course satisfies the military history requirement of the advanced program.**Description:** Significance of military affairs in the context of American political, economic, and social history from America's entry into WWI to the present. Discusses all of the major wars of this period but also emphasizes such themes as the professionalization of the officer corps, the relationship between war and technology (especially nuclear weapons), and civil-military relations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 807 Early Christianity****Crosslisted with:** CLAS 307, CLAS 807, HIST 307, RELG 307**Description:** Life, literature, thought, and institutions of the Christian movement from Jesus to Constantine. A critical, historical approach to the sources in English translation and how they reflect the interaction of Christian, Jew, and pagan in late antiquity. Includes the historical Jesus vis-a-vis the Christ of Faith, the impact of Paul's thought, the formation of Christian dogma, methods of interpreting canonical and extra-canonical Christian literature, the problem of heresy and orthodoxy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 809 Religion of Late Western Antiquity****Crosslisted with:** CLAS 409, CLAS 809, HIST 409, RELG 409**Description:** Examination of the religious institutions, philosophies, and lifeways of the Hellenistic Age from Alexander to Constantine. Includes civic religion of Greece and Rome, popular religion, mystery cults, Judaism, Christianity, popular and school philosophies (Platonism, Aristotelianism, Epicureanism, Cynicism, Stoicism), Gnosticism. History, interrelationships, emerging world view of these movements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 812 Democracy and Tyranny in Classical Athens****Crosslisted with:** HIST 412, CLAS 412**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** Development and influence of the Greek city-states, focusing on the establishment and transformation of the Athenian democracy in the 6th and 5th centuries BCE from popular sovereignty to the rule of written law. Including the three periods of tyranny, reaction to the Persian Invasions, and the impact of the Peloponnesian War.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 814 Medieval Culture****Crosslisted with:** HIST 414, MRST 414, MRST 814**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** Historical context of changes in religion, literature, philosophy, and the arts, 400-1450.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 817 The Roman Revolution, 133 BC-68 AD****Crosslisted with:** HIST 417, CLAS 417**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** Critical period in Roman history when the republic was transformed into the rule by one man: Political and social functioning of the republic, causes for change, and factors influencing its final shape. Careers of the Gracchi, Marius, Sulla, Pompey, Caesar, Anthony, and Augustus.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 818 Augustan Rome****Crosslisted with:** HIST 418, CLAS 418**Prerequisites:** HIST 130/HIST 130H or HIST 210**Description:** Augustus' constitutional transformation of Rome, and enforcement of a national identity and values through religion, social legislation, provincial governance policies, and patronage of public works, display, and literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 821 The German Reformation****Crosslisted with:** HIST 421, RELG 421, MRST 421, MRST 821**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** The cultural and intellectual developments of the German Reformation against its social background. The religious and political events of the first half of the sixteenth century. Transition from medieval to modern Christianity. The transmission and revolutionary nature of evangelical doctrines. The gradual institutionalization of the new churches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History

HIST 822 The Scientific Revolution**Crosslisted with:** HIST 422**Prerequisites:** Junior standing.

Description: Emergence of modern science in the sixteenth and seventeenth centuries and the impact of this new intellectual force on the social, political, and scientific thought of the Enlightenment. Philosophical, religious, and social background to the Scientific Revolution examined closely, and the institutional bases of the new science considered. Attention to the role of mysticism and alchemy in the rise of modern science and to the relationship between science and religion which developed during the period of the Scientific Revolution. Personalities and careers of some of the great scientists of the age—Copernicus, Galileo, Newton—used to illuminate these and other issues.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 826 Reformation Thought****Crosslisted with:** HIST 426, MODL 426, MODL 826, MRST 426, MRST 826, RELG 426, RELG 826**Prerequisites:** Junior standing.

Description: Life and thought of significant figures and schools of thought in the Reformation period

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 828 History of Germany: 1914 to Present****Crosslisted with:** HIST 328**Prerequisites:** Sophomore standing.

Description: Conflict and consensus in the history of Germany from World War I to the present. The Nazi dictatorship in European context, World War II and the Holocaust, the two Germanies from 1945, changes in 1989 and German unification, and developments in Germany and Europe since 9/11.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** European History**HIST 829 History of Fascism in Europe****Crosslisted with:** HIST 429**Prerequisites:** Junior standing.

Description: Comparative study of the rise of fascism in Europe during the twenties; the drift to totalitarianism and the transition to dictatorship. Evolution of domestic and foreign policy to 1945.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** European History**HIST 830 Early European History Through Biography****Crosslisted with:** HIST 430, MRST 430, MRST 830**Prerequisites:** Junior standing**Notes:** Pre-1800 content.

Description: Individuals from late medieval/early modern Europe, such as Joan of Arc, Henry V, and Eleanor of Aquitaine. Examines how history can be used to serve social, cultural, and political needs, and the difficulties of determining historic truth about a person or event.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 831 Medieval England****Crosslisted with:** HIST 431**Prerequisites:** Junior standing

Description: Political, social, economic, institutional, and intellectual history of England from the Roman invasions through the accession of the Tudor dynasty in 1485.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 832 England: Reformation to Revolution, 1530-1660****Crosslisted with:** HIST 432, MRST 432, MRST 832**Prerequisites:** Junior standing**Notes:** Pre-1800 content.

Description: History of English society, politics, and culture from the time of Henry VIII through that of Elizabeth I, Shakespeare, Donne, Charles I, Cromwell, and Milton.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**HIST 834 Palestine and the Arab-Israeli Conflict****Crosslisted with:** HIST 434, JUDS 434**Prerequisites:** Junior standing.

Description: Traces the history of the Arab-Israeli conflict from the 19th century up to the present. Explores the role of ideology, political actors, social history, economic and infrastructural problems, and regional and international interaction, as well as prospects for peace in the 21st century. Examines the related historiographical debates, especially those focusing on the Arab-Israeli Wars of 1948 and 1967.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am, Asian, Middle East Hist

HIST 838 War and Peace in Europe: 1914 to the Present**Crosslisted with:** HIST 338**Prerequisites:** Sophomore, junior, or senior standing.**Description:** Survey of the diplomatic and military history of Europe from World War I to the present. Includes the strategy, tactics, and diplomacy of the two world wars; international relations in the years between the wars; the emergence of a new postwar Europe; and Europe's involvement in the rivalry between the superpowers since 1945.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** European History**HIST 839 The Holocaust****Crosslisted with:** HIST 339, JUDS 339**Prerequisites:** Sophomore standing.**Description:** Europe-wide programs of persecution and genocide carried out under the auspices of the Nazi-German regime between 1933 and 1945. Focuses primarily on the Jewish dimension of the Holocaust, but also examines Nazi policies targeted against Poles, Gypsies, homosexuals, disabled Germans, and other groups. Events analyzed from the perspectives of victims, perpetrators, and bystanders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** European History**HIST 840 Rights & Wrongs in American Legal History****Crosslisted with:** HIST 340, ETHN 340**Prerequisites:** Sophomore standing.**Description:** Analysis of fundamental debates and dilemmas over the attainment and distribution of rights and obligations in American legal history from colonial times to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 841 Seminar in U.S. Women's and Gender History****Crosslisted with:** HIST 441, WMNS 441, WMNS 841**Description:** In-depth, advanced thematic seminar that cultivates historical research and writing skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 842 America Before the Civil War****Crosslisted with:** HIST 442**Prerequisites:** Junior standing.**Description:** American life during the first half of the nineteenth century, with special stress upon the nature of political processes, the many movements for the reform of society, the development of a national economy, and the rise of sectional conflict.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 843 American Urban and Social History I****Crosslisted with:** HIST 343**Prerequisites:** Sophomore, junior, or senior standing.**Description:** Survey and analysis of the impact of economic development and urbanization on the organization and character of American society from colonial times through the civil war. Analyzes the rise and transformation of the southern planter class and the slavery system which supported it; the development and change in character of both farmers and the urban working class; and the evolution of the northern, urban, middle class and its impact on all aspects of American life before the Civil War.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 844 American Urban and Social History II****Crosslisted with:** HIST 344**Prerequisites:** Sophomore, junior, or senior standing.**Description:** Survey and analysis of the impact of metropolitan development, mass-oriented industrialization and economic development, and the modernization of values, ideas, and mores on American society between the Civil War and the recent past. Includes the breakdown of old criteria of class or group definitions and their replacement by newer, more impersonal, economic categories. Attention to the declining role of the farmer in American life, the rise and fall of elite "society", and the further development of mass-oriented middle and working classes after World War II.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 845 The American Civil War and Reconstruction****Crosslisted with:** HIST 445**Prerequisites:** Junior standing.**Description:** Development of the sectional crisis, war and its impact on American institutions, reconstruction and reunion, from 1850 to 1877.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 846 America in the "Gilded Age"****Crosslisted with:** HIST 446**Prerequisites:** Junior standing.**Description:** Sectional adjustment, national politics, the "Gilded Age," economic growth, and the revival of imperialism in the period 1877 to 1901.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist

HIST 851 Rethinking the American West**Crosslisted with:** HIST 351, ETHN 341**Prerequisites:** Sophomore standing.**Description:** Analysis of major events and trends in the history of the American West, including: competing claims to rights and resources; debates over development; overlapping federal, state, and tribal legal jurisdictions; racial/ethnic and gendered interactions; and/or historical roots of contemporary Western concerns.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 852 American West Since 1900****Crosslisted with:** HIST 352**Prerequisites:** Sophomore, junior, or senior standing.**Description:** History of the American West since 1900. History of race, class, and gender; urbanization and industrialization; political movements; population growth, new immigrations, and urban expansion; modern economic trends and environmental change; and the role of the federal government in the American West.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 853 From Progressivism to the Great Crash****Crosslisted with:** HIST 353**Prerequisites:** Sophomore, junior, or senior standing.**Description:** The Progressive Movement, Theodore Roosevelt and the New Nationalism, Wilson and the New Freedom, World War I, the Return to Normalcy, the Jazz Age, and the Great Crash.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 854 The Era of Franklin D. Roosevelt****Crosslisted with:** HIST 354**Prerequisites:** Sophomore, junior, or senior standing.**Description:** The Great Depression, Franklin D. Roosevelt and the New Deal, the road to Pearl Harbor, and World War II.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 855 Post-World War II America****Crosslisted with:** HIST 355**Prerequisites:** Sophomore, junior, or senior standing.**Description:** Surveys the major developments in domestic politics, in foreign affairs, and the economic, social, and cultural spheres from the end of World War II to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 857 19th Century United States Economic History****Crosslisted with:** ECON 457, ECON 857, HIST 457**Prerequisites:** ECON 211 and ECON 212, or ECON 210.**Description:** Transformation of the United States economy from an agrarian to an industrial society and the impact of that transformation on people's livelihoods. The economic of slavery, the impact of the railroads, immigration, and the collective response of business and labor to industrialization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 858 20th Century United States Economic History****Crosslisted with:** ECON 458, ECON 858, HIST 458**Prerequisites:** ECON 211 and ECON 212, or ECON 210.**Description:** Transformation of the United States economy in the twentieth century. Attention to the continued consolidation of the business enterprise, business cycle episodes including the Great Depression of the 1930's, organized labor, and the role of government in managing and coping with this transformation in economic life.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**HIST 859 Women and Gender in African Societies****Crosslisted with:** HIST 459, ETHN 459, WMNS 459, WMNS 859**Description:** Explores how the contemporary women's movement has emerged within Africa and its relationship to social change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 860 The Civil Rights Movement****Crosslisted with:** ETHN 460, HIST 460**Prerequisites:** Junior standing.**Description:** Survey and analysis of the origins, contours, activities, ideas, movement centers, personalities, and legacies of the Civil Rights and Black Power movements in the U.S. A. from the 1950's through the 1970's. The roles of the African-American masses, college and high school students, and women. The points of conflict and cooperation between African-American and mainstream American society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist

HIST 861 Geospatial Approaches in Digital Humanities and Social Sciences

Crosslisted with: ANTH 461, ANTH 861, CLAS 461, CLAS 861, GEOG 461, GEOG 861, HIST 461

Description: Study of geographic concepts and critical analysis of applications of Geographic Information Systems (GIS) in humanities and social sciences and application of geospatial tools for humanities and social science research; learn how to collect, manage, analyze, and visualize spatial data for real-world projects

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Techniques

HIST 862 Recent Russia

Crosslisted with: HIST 462

Prerequisites: Junior standing.

Description: Fifty years of effort at implementing the mandate of the so-called "October Revolution" both domestically and in foreign affairs. The Soviet Union today.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: European History

HIST 863 Indigenous Peoples of Latin America

Crosslisted with: HIST 463, ETHN 463, LAMS 463

Description: Includes Indian politics, ideologies about Latin American indigenous peoples, global issues, and inter-ethnic relationships in Latin America.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Lat Am,Asian,Middle East Hist

HIST 864 Native American History: Selected Topics

Crosslisted with: ETHN 464, HIST 464

Prerequisites: Junior standing.

Description: Issues in Native American History. Topics may include: Native Americans and the environment; Native Americans in the 19th or 20th century; Native Americans and federal Indian policy; Native Americans and gender; and Native Americans of regions other than the Great Plains.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: United States or Canadian Hist

HIST 869 Global Environmental History

Crosslisted with: HIST 469

Prerequisites: Junior standing.

Description: Past interactions among societies and nature in a comparative world perspective. Indigenous peoples' resource management; ecological impacts of colonization; how political economies shape resource use; changing ideas about nature; and the historic roots of current environmental problems and possible solutions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Lat Am,Asian,Middle East Hist

HIST 870 Digital History

Crosslisted with: HIST 470

Prerequisites: Junior standing.

Description: Analysis of the theory, methods, and readings in humanities computing and digital history.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Groups: Additional History Courses

HIST 872 Digital Humanities Practicum

Crosslisted with: ENGL 472, ENGL 872, HIST 472, ANTH 471, ANTH 871, MODL 472, MODL 872

Prerequisites: Junior standing.

Description: Provide students with real, in-depth experience in collaboratively creating digital humanities projects. Guided by faculty with expertise in a broad range of digital humanities methods and resources, students work in teams to tackle challenges proposed by UNL researchers and/or local and regional humanities organizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Digital Humanities

HIST 874 African Americans in the Jazz Age

Crosslisted with: ETHN 474, HIST 474

Prerequisites: Junior or senior standing.

Notes: A basic understanding of United States history is recommended.

Description: Race relations and African American experience from the 1910s through WW II. Jim Crow, the Great Migration, WW I, "The New Negro," Harlem Renaissance, jazz/blues/gospel music, political radicalism, the Great Depression, and WW II.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: United States or Canadian Hist

HIST 876A Gender and Sexuality in Latin America**Crosslisted with:** HIST 476A, ETHN 476A, WMNS 476A, WMNS 876A**Prerequisites:** Junior standing.**Description:** Experience of femininity and masculinity compared according to time and place, revealing the intimate connections with nation, modernity, race, and ethnicity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 876B Race in Modern Latin America****Crosslisted with:** HIST 476B, ETHN 476B**Prerequisites:** Junior standing.**Description:** The experience of race and ethnicity in the 20th and 21st centuries compared according to time and place, revealing the intimate connections with nation and modernity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 877 Indigenous Peoples of the World****Crosslisted with:** ETHN 477, HIST 477**Prerequisites:** Junior standing.**Description:** Indigenous peoples worldwide and current issues concerning them. Tribal sovereignty, territorial conflicts, globalization, ecosystem destruction, human rights, and the World Indigenous Movement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 878 Pro-seminar in Latin American Studies****Crosslisted with:** ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, GEOG 878, POLS 878, SOCI 878, MODL 878, EDPS 878**Prerequisites:** Junior standing and permission.**Notes:** Topical seminar required for all Latin American Studies majors.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Integrative Courses, Research Regional Geography Lat Am,Asian,Middle East Hist International Relations&Compar**HIST 879 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, ANTH 479, ANTH 879, ECON 866, GEOG 448, GEOG 848, HIST 479, SOCI 466, SOCI 866**Prerequisites:** Senior standing and permission.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations&Compar Variable group based on topic**HIST 881 History of Premodern Japan****Crosslisted with:** HIST 381**Prerequisites:** Sophomore, junior, or senior standing.**Notes:** Pre-1800 content.**Description:** Analysis of premodern Japanese society with emphasis on institutional and cultural developments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History Lat Am,Asian,Middle East Hist**HIST 882 History of Modern Japan****Crosslisted with:** HIST 382**Prerequisites:** Sophomore, junior, or senior standing.**Description:** Establishment of a modern state; foundations of economic power; liberalism and oligarchical rule; militarism; post-World War II developments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 883 History of Premodern China****Crosslisted with:** HIST 383**Prerequisites:** Sophomore, junior, or senior standing.**Notes:** Pre-1800 content.**Description:** History of China to 1800 with emphasis on intellectual history (Confucianism, Taoism, Buddhism, Neo-Confucianism) and the political, economic, and social development of the Chinese empire (221 BC to 1800 AD).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** HIST 380**Groups:** Pre-1800 History Lat Am,Asian,Middle East Hist**HIST 886 History of South Africa****Crosslisted with:** ETHN 486, HIST 486**Prerequisites:** Junior standing.**Description:** Survey of the history of South Africa from the Stone Age to the evolution of the political, economic, legal and social framework of apartheid, and the recent efforts to achieve political accommodation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist

HIST 890 Topics in World History**Crosslisted with:** HIST 490**Prerequisites:** Junior standing.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**HIST 894 Directed Readings****Prerequisites:** Permission**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**HIST 895 Internship in Digital Humanities****Crosslisted with:** MODL 895, ENGL 895E**Description:** Active participation in an ongoing digital humanities project in the Center for Digital Research in the Humanities, including weekly meetings designed to build technical and project management skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HIST 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**HIST 900 Introduction to Historical Study****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**HIST 918 Interdisciplinary Seminar in Nineteenth-Century Studies****Crosslisted with:** ENGL 918, MODL 918**Description:** Invention of the nineteenth century, gender, colonialism, class, realism science and technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**HIST 919 Interdisciplinary Approaches to the Nineteenth Century****Crosslisted with:** ENGL 919, MODL 919**Description:** Introduction to the nineteenth century in North America (focusing on the US), Great Britain, and Europe (focusing on France, Germany, Russia, and Spain), organized through themes such as constructions of gender and sexuality, democracy in the nation-state, and challenges to religion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HIST 931 Readings and Problems in Pre-Modern European History****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**HIST 933 Readings and Problems in Recent European History****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**HIST 941 Readings and Problems in American History Before 1877****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**HIST 943 Readings and Problems in American History since 1877****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HIST 946 Interdisciplinary Readings in Digital Humanities****Crosslisted with:** MODL 946, ENGL 946, ANTH 946**Description:** Methods, theories, and practices of digital humanities scholarship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HIST 950 Graduate Seminar in Reading and Writing History****Description:** Leads students through intensive primary source research and writing project on historical topic of student's choice. Letter grade only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**HIST 951 History of Women and Gender****Crosslisted with:** WMNS 951**Description:** A comparative approach, offering readings on a central theme from a variety of periods and/or areas. Themes vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HIST 953 Comparative Topics and Approaches in History****Description:** Exploration of particular topics or approaches to history across multiple time frames and geographical areas. Topics and approaches will vary depending on professor's area of expertise. Letter grade only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HIST 961 Readings and Problems in World History

Description: Explores major transformations that shaped world history from late medieval to modern eras. Examines ecological, economic, political, and cultural perspectives. Letter grade only.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 963 Reading and Problems in Non-Western History

Description: Introduction to major problems and debate in non-Western history. Rotates among faculty who specialize in African, Asian, Latin American, and Middle Eastern history. Letter grade only.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 970 Seminar in Digital History

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 983 Readings and Problems in Race, Ethnicity, and Identity in History

Crosslisted with: ETHN 983

Description: Engages with recent and classic scholarship on race, ethnicity, and identity, primarily in American history. Covers new comparative and transnational scholarship. May emphasize different themes and readings depending on area of expertise of faculty. Letter grade only.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 985 Readings and Problems in German and Central European History

Crosslisted with: GERM 985

Description: Examines recent and classic scholarship on German and Central European History. Covers different periods, topics, and regions depending on professor's expertise. Letter grade only.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 987 Readings and Problems in 20th-Century International History

Crosslisted with: POLS 987

Description: Provides a foundational understanding of major developments in the 20th century, including colonialism and decolonization, great-power conflicts, world economy, and role of ideology. Incorporates perspectives of international relations, world history, and transnational history. Letter grade only.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 988 Introduction to the Interdisciplinary Study of the Middle Ages

Crosslisted with: AHIS 988, ENGL 988, MODL 988, MUSC 988

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Middle Ages. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 989 Introduction to the Interdisciplinary Study of the Renaissance

Crosslisted with: AHIS 989, ENGL 989, MODL 989, MUSC 989

Description: Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Renaissance. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 990 Seminar in Special Problems of Teaching History

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

HIST 991 Readings and Problems in the History of the North American West

Crosslisted with: GPSP 991

Description: History of the North American West with special attention to Great Plains. Past and present historiography; modern themes and methodologies; and topical and comparative historical treatments.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 993 Press Internship

Prerequisites: Permission of the Graduate Chair in History.

Notes: Work in HIST 993 is to be supervised by the History Acquisitions editor at the University of Nebraska Press. HIST 993 is Pass/No Pass only.

Description: Internship at the University of Nebraska Press.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: FLD

HIST 995 History Practicum

Description: Allows graduate students to volunteer or intern at a museum, archive, historical society, or other history-related organization. Pass/No Pass only.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HIST 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Horticulture (HORT)

HORT 801 Biology of Plant Pathogens

Crosslisted with: PLPT 801, AGRO 801

Prerequisites: PLPT 369 or equivalent

Description: Molecular and cellular approach to the study of plant pathological principles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

HORT 802 Ecology and Management of Plant Pathogens

Crosslisted with: PLPT 802, AGRO 802

Prerequisites: PLPT 369 or equivalent; an introduction to biochemistry course

Description: Principles of plant disease epidemiology and disease control through cultural, biological, chemical and host plant resistance strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

HORT 803 Scientific Writing and Communication

Crosslisted with: AGRO 403, AGRO 803, HORT 403

Prerequisites: Senior standing or higher, an ACE 1 written communication course, an ACE 2 oral communication course, and permission of instructor.

Description: Reading and critiquing, writing, and presenting scientific information. Use research data to compose a manuscript in standard scientific format, and prepare and present a poster to a general audience. Ethical issues in research and writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 806 Plant Ecophysiology: Theory and Practice

Crosslisted with: AGRO 806, HORT 406, NRES 406, NRES 806, AGRO 406

Prerequisites: Junior standing; 4 hrs ecology; and 4 hrs botany or plant physiology.

Description: Principles of plant physiology which underlie the relationship between plants and their physical, chemical and biotic environments. An introduction to the ecological niche, limiting factors and adaptation. An overview of the seed germination and ecology, plant and soil water relations, nutrients, plant energy budgets, photosynthesis, carbon balance and plant-animal interactions. An introduction to various field equipment used in ecophysiological studies.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

HORT 807 Bio-Atmospheric Instrumentation

Crosslisted with: AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, GEOG 869, METR 869, MSYM 869, NRES 869

Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.

Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Physical Geography

HORT 808 Microclimate: The Biological Environment

Crosslisted with: AGRO 408, GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, AGRO 808, GEOG 808, METR 808, NRES 808

Prerequisites: Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering.

Description: Physical factors that create the biological environment. Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGRO 907, HORT 907, METR 907, NRES 907; BSEN 954, NRES 954

Groups: Physical Geography

HORT 809A Case studies in plant breeding: Breeding for Disease Resistance**Crosslisted with:** AGRO 409A, AGRO 809A, HORT 409A**Description:** The application of fundamental genetics principles in inheritance, gene mapping and DNA analysis to decision making by plant breeders with the goal of improving disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of plant breeders who will use these discoveries in their work.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 809B Case Studies in plant breeding: Transgenic strategies for disease resistance****Crosslisted with:** AGRO 409B, AGRO 809B, HORT 409B**Description:** The application of basic science and technology by plant genetic engineering experts with the goal of teaming with plant breeders to improve disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of genetic engineers and plant breeders who will use these discoveries in their work.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 810 Plant Molecular Biology****Crosslisted with:** AGRO 810, BIOC 810**Prerequisites:** AGRO 215 or BIOS 206; BIOC 831**Description:** Molecular genetic basis of biological function in higher plants. Genome organization, gene structure and function, regulation of gene expression, recombinant DNA, and genetic engineering principles. Material taken primarily from current literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**HORT 811 Plant Tissue Culture****Crosslisted with:** BIOS 811, NRES 811**Description:** Survey of techniques used in plant cell, tissue and organ culture, including current research. Laboratory emphasizes practical manipulation of plant cells, tissues, and organs, including examples from woody and herbaceous plant species.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**HORT 812 Landscape Ecology****Crosslisted with:** NRES 810**Prerequisites:** 12 hrs biological sciences or related fields including BIOS 320**Description:** Spatial arrangements of ecosystems, the interaction among component ecosystems through the flow of energy, materials and organisms, and alteration of this structure through natural or anthropogenic forces.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 813 Turfgrass and Landscape Weed Management****Crosslisted with:** AGRO 813, TLMT 813**Description:** Fundamental terminology associated with turfgrass and landscape weed management. Weed identification and the cultural practices and herbicide strategies to limit weed invasion and persistence.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 814 Turfgrass Disease Management****Crosslisted with:** AGRO 414, AGRO 814, HORT 414, PLPT 414, PLPT 814, TLMT 414, TLMT 814**Prerequisites:** BIOS/PLPT 369 or one semester of introductory plant pathology.**Description:** Pathogens, epidemiology, and control of diseases specific to turfgrass.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 817 Plant Pathology Principles and Application****Crosslisted with:** PLPT 817, AGRO 817**Prerequisites:** 12 hours of prior coursework in the plant sciences**Description:** Introduction to the biology of plant pathogenic organisms; pathogen-plant interactions; environmental influences; cultural, resistance, and chemical strategies for plant disease management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 818 Agroforestry Systems in Sustainable Agriculture****Crosslisted with:** HORT 418, NRES 417, NRES 817**Prerequisites:** 12 hours biological or agricultural sciences.**Description:** The roles of woody plants in sustainable agricultural systems of temperate regions. Emphasis on the ecological and economic benefits of trees and shrubs in the agricultural landscape. Topics include: habitat diversity and biological control; shelterbelts structure, function, benefits and design; intercropping systems; silvopastoral systems; riparian systems; and production of timber and specialty crops. Comparison of temperate agroforestry systems to those of tropical areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 821 Learning Biotechnology****Crosslisted with:** AGRO 821**Description:** Investigate biotechnology and its application in solving problems and connect biotechnology to basic science concepts in biology and chemistry. Integrate individually-designed biotechnology lessons into learning standards.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HORT 822 Integrated Weed Management**Crosslisted with:** AGRO 822**Prerequisites:** 12 hrs AGRO and/or closely related HORT and/or BIOS**Description:** Principles and application of (IWM). Noxious and invasive weed species. Crops and weed control. Plant population shifts. Use of herbicides and the biologically effective dose. Critical period of weed control and weed threshold. Herbicide tolerant crops.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 824 Plant Nutrition and Nutrient Management****Crosslisted with:** AGRO 824**Prerequisites:** AGRO 325 or basic course in plant physiology. A course in organic chemistry or biochemistry recommended**Notes:** Offered spring semesters.**Description:** Macro and micro nutrient elements and their function in the growth and development of plants. Role of single elements. Interaction and/or balances between elements and nutrient deficiency and/or toxicity symptoms as they affect the physiology of the whole plant. Relationship between crop nutrition and production and/or environmental considerations (e.g. yield, drought, temperature, pests).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 826 Invasive Plants****Crosslisted with:** AGRO 426, AGRO 826, HORT 426, NRES 426, NRES 826**Prerequisites:** AGRO/HORT/SOIL 153; BIOS 109.**Description:** Identification, biology and ecology of weedy and invasive plants. Principles of invasive plant management by preventative, cultural, biological, mechanical and chemical means using an adaptive management framework. Herbicide terminology and classification, plant-herbicide and soil-herbicide interactions, equipment calibration and dosage calculations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 827 Turfgrass Systems Management****Crosslisted with:** AGRO 427, HORT 427, TLMT 427, AGRO 827, TLMT 827**Prerequisites:** TLMT 227 and TLMT 327.**Description:** Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 828 Scientific Illustration****Crosslisted with:** ENTO 828, AGRI 828, AGRO 828**Prerequisites:** 12 hrs agricultural and/or biological sciences.**Description:** Prepare scientifically accurate, high quality illustrations and graphics for the teaching, presentation, and publication of scientific information. Drawing techniques, drafting, copyright, and publication and presentation of scientific art work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, ANTH 829A, AGRO 429A, AGRO 829A, HORT 429A, NRES 429A, NRES 829A, NUTR 429A, NUTR 829A**Prerequisites:** Junior standing**Description:** Overview of the technical and sociocultural dimensions of global food insecurity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 832 Learning Plant Science****Crosslisted with:** AGRO 832**Description:** The biology of plants grown for food, fiber, fuel and fun. Connect applied plant science to basic science concepts in biology and chemistry. Integrate individually-designed plant science lessons into learning standards.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 836 Agroecosystems Analysis****Crosslisted with:** AGRO 436, AGRO 836, HORT 436**Prerequisites:** Senior standing.**Notes:** Cost of travel required. Summer travel course with multi-state faculty. Farm visits to Iowa, Minnesota and Nebraska.**Description:** Analysis of production, economics, environmental impacts, and social integration aspects of farms and farming systems**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**HORT 839 Organic Farming and Food Systems****Crosslisted with:** AGRO 839, AGRO 439, HORT 439**Prerequisites:** Admission to the MS or PhD program**Description:** History of organic farming and horticultural systems, organic certification, nutrient and pest management in organic systems, planning organic enterprises including production and marketing, resilience of organic systems in ecological, economic, and social terms; future issues and potentials of organic food systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 840 Turfgrass and Landscape Integrated Pest Management****Crosslisted with:** TLMT 840**Description:** Principles of turfgrass and landscape plant pest management and tools to implement Integrated Pest Management (IPM) approaches. Creating healthy landscapes and effectiveness of IPM alternatives.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC

HORT 841 Perennial Plant Function, Growth, and Development**Crosslisted with:** AGRO 441, AGRO 841, HORT 441, RNGE 441**Prerequisites:** AGRO 325 or equivalent.**Description:** Principles of crop physiology and developmental morphology in relation to function, growth, development, and survival of perennial forage, range, and turf plants. The relationship of physiology and morphological development on plant use and management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 842A Plant Pathology****Description:** Survey of the principles and practice of plant pathology.

The main and genetic elements in plant disease will be covered. Many of the major diseases, as well as their causes and effects, will be surveyed. Course is taught by faculty from the University of Nebraska-Kearney, and will be offered in the spring semester of even-numbered calendar years. To enroll, students must be accepted into the horticulture graduate certificate program or get permission.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 842B Plant Physiology****Description:** Life processes of plants, with an emphasis on water relations and hormonal and stress physiology. Includes fundamental concepts underlying the science of crop physiology, including crop phenology, canopy development and light interception, photosynthesis and respiration, and dry matter partitioning. Course is taught by faculty from the University of Nebraska-Kearney, and will be offered in the fall semester of even-numbered calendar years. To enroll, students must be accepted into the horticulture graduate certificate program or get permission.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 842E Floral Crops Production and Handling****Prerequisites:** Admission to the Horticulture graduate certificate program; and permission**Notes:** Distance education course delivered by Kansas State University. HORT 842E is offered spring semester of even-numbered calendar years.**Description:** Principles and commercial practices for producing floral potted crops and cut flowers and the physical responses of plants to their environment. Aspects of post harvest physiology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**HORT 842J Water Issues in Lawn and Landscape****Prerequisites:** Admission to the Horticulture graduate certificate program; and permission**Notes:** Distance education course delivered by Kansas State University. Hort 842J is offered spring semesters.**Description:** Critical water issues related to irrigation in urbanizing watersheds and water quality and quantity. Factors impacting water scarcity and quality. Interrelatedness of correct irrigation practices and water quality/quantity and equip students to protect water resources through application of science-based irrigation practices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 843A Greenhouse Crop Production****Prerequisites:** Admission to the Horticulture graduate certificate program; and permission**Notes:** Distance education course delivered by Texas Tech University. Hort 843A is offered spring semester of odd-numbered calendar years.**Description:** Introduction to the concepts of greenhouse construction, operation and management for a variety of horticultural crops, with an emphasis on ornamental crops. Greenhouse construction, heating, cooling, growing media, pest management, nutrition, fertility, growth regulation, irrigation, post-harvest handling, and marketing of greenhouse crops.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**HORT 843B Seed Sciences****Prerequisites:** Admission to the Horticulture graduate certificate program; and permission**Notes:** Distance education course delivered by Texas Tech University. HORT 843B is offered spring semester of even-number calendar years.**Description:** Seed morphology, anatomy, and chemistry. Germination, emergence, and dormancy processes in seed, as well as various quality aspects including vigor, longevity, and deterioration. Discussion of genetically engineered seeds and other current topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 843E Advanced Interiorscaping****Prerequisites:** Admission to the Horticulture graduate certificate program; and permission**Notes:** Distance education course delivered by Texas Tech University. HORT 843E is offered spring semester of even-numbered calendar years.**Description:** Physiological principles and industry practices in the production, moving, care, and maintenance of interior plants. Career tools to design, install and maintain interior plant-scapes. Review of pertinent literature and class exercises designed to improve skills and knowledge of interior plant physiology, care and maintenance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HORT 843J Herbicide Action

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by Texas Tech University. HORT 843E is offered spring semester of odd-numbered calendar years.

Description: Familiarize advanced students with current state of knowledge on herbicide modes and mechanisms of action and recent developments by industry and universities in plant physiology. Integration of plant pathology, plant physiology, biochemistry, plant breeding, and principles of weed science as they relate to herbicide modes and mechanisms of action.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

HORT 843K Advanced Arboriculture

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by Texas Tech University. HORT 843K is offered fall semester of odd-numbered calendar years.

Description: Physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees, shrubs, and ground covers. Provides career tools for installation and maintenance woody plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 843M Weed Science

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by Texas Tech University. HORT 843M is offered fall semester of odd-numbered calendar years.

Description: Weeds and weed control methods in agronomic and horticultural crops and turf grass with chemical weed control. History of weed control, weed characteristics, weed competition, and methods of weed control including mechanical, cultural, biological, and chemical. Discussion of herbicides by family with regard to chemical structure, efficacy, mode and mechanism of action, crop selectivity, soil activity and persistence, and cost.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

HORT 844A Environmental Nursery Production Practices

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by North Carolina State University. HORT 844A is offered spring semester of odd-numbered calendar years.

Description: Cultural nursery crop production practices presented in consideration of current best management practices, conservation of resources, scientific research-based investigations related to nursery cultural practices, potential risks to nursery personnel, and off-site movement of airborne materials and effluents to surrounding areas and public watersheds.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 844B Environmental Stress Physiology

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by North Carolina State University. HORT 844B is offered spring semester every year and fall semester of even-numbered calendar years.

Description: Physiology of plant responses to environmental stresses, with emphasis on current research in selected physiological, molecular, and biochemical mechanisms for tolerance to environmental stresses, such as temperature extremes, drought, salt, pathogens and other plants.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

HORT 844E General Viticulture

Prerequisites: Admission to the Horticulture graduate certificate program; and permission

Notes: Distance education course delivered by North Carolina State University. HORT 844E is offered spring semester of odd-numbered calendar years.

Description: Aspects of grapes from vine anatomy to final products. Cultivars, propagation, canopy management, diseases, weed control, physiology, anatomy, irrigation, wine production, climates and soils.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 849 Woody Plant Growth and Development

Crosslisted with: BIOS 849, NRES 849

Prerequisites: CHEM 251 and AGRO 325

Description: Plant growth and development specifically of woody plants as viewed from an applied whole-plant physiological level. Plant growth regulators, structure and secondary growth characteristics of woody plants, juvenility, senescence, abscission and dormancy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 871 Vines, Wines and You

Crosslisted with: HORT 471, NUTR 471, NUTR 871, HRTM 471, HRTM 871

Prerequisites: 6 hrs science or equivalent experience; 21 years of age or older

Notes: Proof of age is required.

Description: Origin, botany, historical and cultural significance of the grapevine and related species. Principles and practices of vineyard establishment, management and processing of grape products, importance and/or scope of grape and wine industry; global and local significance. Culinary applications, health, environmental and safety-related issues, business and industry relations and experience.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

HORT 878 Plant Anatomy**Crosslisted with:** BIOS 478, BIOS 878, AGRO 478, AGRO 878, HORT 478**Prerequisites:** 8 hrs biological sciences**Notes:** BIOS 109 recommended.**Description:** Development, structure, and function of tissues and organs of the higher plants. Relationships of structure to physiology and ecology of plants.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 879**HORT 880 Modified Rootzones****Crosslisted with:** AGRO 480, HORT 480, TLMT 480, TLMT 880, AGRO 880**Notes:** Offered as a five-week course.**Description:** Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**HORT 888 Business Management for Agricultural Enterprises****Crosslisted with:** HORT 488, EAEP 488, AGRO 488, ENTR 488, EAEP 888, AGRO 888, ENTR 888, ABUS 488**Description:** Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. Requires the completion of a shadowing assignment and the analysis of case studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 889 Urbanization of Rural Landscapes****Crosslisted with:** AGRO 489, AGRO 889, CRPL 489, HORT 489, CRPL 889**Prerequisites:** Senior standing or graduate standing.**Description:** Development converts rural landscapes into housing, roads, malls, parks, and commercial uses. This process fragments landscapes and changes ecosystem functions, drives up land prices, and pushes agriculture into more marginal areas. This multi-disciplinary, experiential course guides students in learning about the urbanization process, the impacts on landscapes, people, and the community, and the choices that are available to informed citizens.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 894 Graduate Degree Project Credits****Crosslisted with:** AGRO 894**Prerequisites:** Admission to Master of Agronomy or Horticulture degree program**Notes:** Project activity for the nonthesis option II MS degree.**Description:** Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**HORT 896 Independent Study****Prerequisites:** 12 hrs plant sciences, permission and advance approval of plan of work**Description:** Individual or group projects in research and literature review under supervision and evaluation of a departmental faculty member.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**HORT 897 Master of Applied Science Project****Crosslisted with:** AGRI 897, AGRO 897, NRES 897**Prerequisites:** Admission to Master of Applied Science degree program**Notes:** Project activity for the Master of Applied Science degree.**Description:** Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**HORT 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**HORT 907 Agricultural Climatology****Crosslisted with:** AGRO 907, METR 907, NRES 907**Prerequisites:** NRES 808; STAT 801A or equivalent**Description:** Offered spring semester of odd-numbered calendar years. Analysis and use of climatological data as applied to agricultural activities and the use of climatological information to assist in decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 919 Plant Genetics****Crosslisted with:** AGRO 919**Prerequisites:** AGRO 215**Description:** Focus student learning on principles related to mendelian, population, and molecular genetics of plants including allelisms, nonallelic gene interaction, linkage and recombination, mode of inheritance, mutation, epigenetics, DNA-based markers and mapping techniques, inheritance of qualitative and quantitative traits, and plant transformation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HORT 920 Xenobiotics in the Environment**Crosslisted with:** AGRO 920, ENTO 920, EOHT 920, NRES 920**Prerequisites:** Recommend one course each in organic chemistry, soil science, biochemistry, plant physiology, microbiology and ecology**Description:** Fate and ecotoxicological impacts of biologically foreign compounds in soil-water-plant environments; uptake, mechanisms of toxicity and metabolism in plants and other biota. Herbicides and other pesticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 931 Population Genetics****Crosslisted with:** AGRO 931, ASCI 931**Prerequisites:** AGRO 215 and STAT 801A**Description:** Structure of populations, forces affecting gene frequency and frequency of genotypes, continuous variation, population values and means, genotypic and environmental variances and covariances.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGRO 932, STAT 847; ASCI 932; ASCI 933; ASCI 944, STAT 844**HORT 963 Genetics of Host-Parasite Interaction****Crosslisted with:** AGRO 963, PLPT 963**Prerequisites:** BIOS 820; and permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HORT 965 Plant Virology****Crosslisted with:** PLPT 965, AGRO 965**Prerequisites:** PLPT 801 or 802; and permission.**Notes:** PLPT 865 is offered odd-numbered calendar years.**Description:** Virus molecular biology; virosphere; virus-vector relationships; plant resistance to virus infection economic impact and control of plant diseases by viruses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**HORT 968 Seminar in Plant Pathology****Crosslisted with:** PLPT 968, AGRO 968**Prerequisites:** Permission**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**HORT 991 Seminar Presentation and Evaluation****Crosslisted with:** AGRO 991**Description:** Various topics in horticulture, agronomy or related subjects. Emphasis on techniques.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 2**Format:** LEC**HORT 992 General Seminar****Crosslisted with:** AGRO 992, NRES 992**Notes:** Agronomy and Horticulture PhD students should enroll in this course twice.**Description:** Expected of all Agronomy and Horticulture graduate students. Presentation of thesis/dissertation or non-thesis topics in agronomy, horticulture or related subjects. Agronomy and Horticulture PhD students should enroll in this course twice.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** LEC**HORT 996 Research Other Than Thesis****Prerequisites:** Permission**Description:** Investigations, without reference to thesis work, on genetic, physiological, ecological, meteorological, and morphological aspects of horticultural crops.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**HORT 999 Doctoral Dissertation****Crosslisted with:** AGRO 999**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Hospitality, Restaurant and Tourism Management (HRTM)

HRTM 871 Vines, Wines and You**Crosslisted with:** HORT 471, HORT 871, NUTR 471, NUTR 871, HRTM 471**Prerequisites:** 6 hrs science or equivalent experience; 21 years of age or older**Notes:** Proof of age is required.**Description:** Origin, botany, historical and cultural significance of the grapevine and related species. Principles and practices of vineyard establishment, management and processing of grape products, importance and/or scope of grape and wine industry; global and local significance. Culinary applications, health, environmental and safety-related issues, business and industry relations and experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 874 Food and Beverage Management****Crosslisted with:** HRTM 474**Prerequisites:** HRTM 274 or equivalent**Notes:** Letter Grade only**Description:** Functioning and operation of food-service units. Principles of food and beverage management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HRTM 875 Club Management**Crosslisted with:** HRTM 475**Prerequisites:** HRTM 171 or PGAM Major.**Description:** The operation and management of private and public clubs. Topics include: the general manager concept, organizational structure of clubs, board of directors, membership requirements, equity and non-equity clubs, tax-exempt clubs and non-tax-exempt clubs, duties and responsibilities of department heads in clubs, governmental regulations, the future of clubs, and their relationship to the hospitality industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 876 Internship in Hospitality Management****Crosslisted with:** HRTM 476**Prerequisites:** HRTM 397 and permission of the Hospitality Management Committee.**Notes:** Requires a total of 400 hours of full-time experience. Letter Grade only.**Description:** Approved professional experience as an entry-level manager in the hospitality industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**HRTM 881 Legal Environment in Hospitality Management****Crosslisted with:** HRTM 481**Prerequisites:** Senior standing; HRTM major or minor**Notes:** Letter grade only.**Description:** Laws and regulations affecting the hospitality industry. Recognition of potential legal hazards, correcting hazardous situations, and reacting in unforeseen circumstances.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 883 Hospitality Finance****Crosslisted with:** HRTM 483**Prerequisites:** Senior standing; Major or minor in HRTM; HRTM 310**Notes:** Letter grade only.**Description:** Introduction to basic skills of financial management in a hospitality industry setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 884 Human Resources Management in the Hospitality Industry****Crosslisted with:** HRTM 484**Prerequisites:** HRTM Major or Minor and Junior Standing.**Description:** Study of management and human resource systems common in the hospitality industry. Case studies, role plays, and simulations are used to examine management and human resource problems unique to the hospitality industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 885 Advanced Lodging Operations****Crosslisted with:** HRTM 485**Prerequisites:** HRTM 285**Notes:** Requires field trips to local lodging facilities. Letter Grade only.**Description:** Senior management techniques required to operate a lodging facility applying strategic and critical thinking with case study analysis to solve problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 889 Advanced Event Operations****Crosslisted with:** HRTM 489**Prerequisites:** HRTM 289**Notes:** Requires field trips to local conference and meeting centers. Letter Grade only.**Description:** The management and operation of events. Design, marketing, and promotion efforts. Identifying sponsors. Marketing to attendees, exhibitors, and other participants.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HRTM 895 Hospitality Management Study Tour****Crosslisted with:** HRTM 495**Notes:** Number of credits hours earned is determined by tour length, assignments, and sites visited. Requires off-campus travel.**Description:** Broadening perspective and developing an understanding of the hospitality industry through visits. Tours to hospitality facilities, national food and equipment shows; food processors; equipment manufacturers; and trade exchanges.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**HRTM 896 Independent Study****Crosslisted with:** HRTM 496**Prerequisites:** 12 hrs HRTM**Notes:** Requires a contract with an individual HRTM faculty member in HRTM. Letter grade only.**Description:** Individual projects in research, literature review, and/or creative activity.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** IND

Human Sciences (HUMS)

HUMS 865 International Perspectives of Human Sciences**Prerequisites:** 9 hours of human sciences classes**Description:** Cross-cultural interdisciplinary perspectives of human sciences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

HUMS 875 Research Methods**Crosslisted with:** TMFD 875**Description:** Research methods that addresses practical and theoretical issues involved in designing, conducting, and evaluating research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**HUMS 891 Special Topics in Human Sciences****Crosslisted with:** NUTR 891, SLPA 891, TEAC 891, TMFD 891, CYAF 891**Description:** Aspects of human sciences not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Industrial and Management Systems Engineering (IMSE)

IMSE 871 Tool and Die Design**Crosslisted with:** IMSE 471**Description:** General consideration in tool designing, design of tool and workholding devices, forming machines and presswork tools; application of computer graphics and finite element techniques, and prediction of tool paths in CNC machines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IMSE 914 Physiological Aspects of Ergonomics****Prerequisites:** IMSE 816**Description:** Lecture and laboratory study of physiological factors affecting human performance during work. Includes evaluation and testing of physical work capacity, applied work physiology, and factors affecting work performance in stress producing environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IMSE 915 Biomechanics****Prerequisites:** IMSE 816**Description:** Introduction and historical developments, theoretical fundamentals of the mechanics of the body. The link system of the body and kinematic aspects of extremity joints. of human motion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Integrative Biomedical Sciences (IBMS)

IBMS 999 Doctoral Dissertation**Prerequisites:** Admission to IBMS doctoral degree program and supervisory committee chair**Credit Hours:** 1-15**Min credits per semester:** 1**Max credits per semester:** 15**Max credits per degree:** 99**Format:** IND

Interior Design (IDES)

IDES 820 Branding**Crosslisted with:** IDES 420**Prerequisites:** Acceptance into the IDES, ARCH or LARC professional program, or into the MS in Architecture programs**Description:** An examination of the relationship between the Brand and the Branded Environment and the emotional connections created.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** PSI**IDES 821 Environmental Graphic Design****Crosslisted with:** IDES 421**Prerequisites:** Acceptance into the IDES, ARCH or LARC professional program, or into the MS in Architecture programs**Description:** Focuses on the way people understand the built environment. Design for wayfinding, information graphics, architectural graphics such as signage, exhibit design, and themed environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 845 History of Interiors and Designed Objects****Crosslisted with:** IDES 445**Prerequisites:** Admission to the professional program in interior design or architecture**Description:** History and development of interiors and furnishings from prehistoric times to the present day, emphasizing the eighteenth, nineteenth, and twentieth centuries. Interiors and furnishings focused on the West yet considered within a global context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 858 The Changing Workplace****Crosslisted with:** ARCH 458, ARCH 558, ARCH 858, IDES 458**Description:** Survey and integration of theory, methods, research and findings from the social, behavioral, and managerial sciences as they relate to the design of work environments. Factors effecting change in the contemporary workplace.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

IDES 861 Design of Senior Housing**Crosslisted with:** IDES 461**Prerequisites:** Acceptance into the IDES, ARCH or LARC professional program, or into the MS in Architecture programs**Description:** Focuses on critical issues in aging and their application to the built environment. Theoretical concepts related to aging and the environment will be examined. Emphasis will be placed on the application of evidence based to design to project solutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** PSI**IDES 882 Advanced Color Theory****Crosslisted with:** ARCH 482, ARCH 582, ARCH 882, IDES 482**Prerequisites:** Admission to the third year in architecture or Interior Design Program.**Description:** Advanced color theories and their application to the Built environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 884 Material Culture: The Social Life of Things****Crosslisted with:** IDES 484**Description:** The theories and practices of material culture. History and interior design—and the broad category of humanity itself—through the lens of material objects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 885 Research Methods in Architecture and Interior Design****Crosslisted with:** ARCH 885**Description:** Research methods employed by the diverse specializations within the disciplines of architecture and interior design. Methods which contribute to a theoretical and informational body of knowledge as well as those contributing directly to design application.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 886 Evolving Issues in Interior Design****Crosslisted with:** IDES 486**Prerequisites:** Admission to the BSD Program.**Description:** Contemporary and controversial issues. Nuances of the field and practice of interior design and its relationship to the allied design disciplines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**IDES 889 Design Research****Crosslisted with:** ARCH 489, ARCH 589, ARCH 889, IDES 489, LARC 489**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Comprehensive overview of the complementary and contributory relationship between research and design, with a particular emphasis on design research as a projective activity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**IDES 891 Selected Topics in Interior Design****Crosslisted with:** IDES 491**Description:** Group investigation of a topic in interior design originated by instructor.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**IDES 898 Problems in Interior Design****Crosslisted with:** IDES 498**Description:** Individual investigation of a topic in interior design.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND

Journalism & Mass Communications- New Core (JOMC)

JOMC 808 Politics and the Media**Crosslisted with:** JOMC 408**Description:** Current issues in media and politics, domestically and internationally.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 812 Literature of Journalism****Crosslisted with:** JOMC 412**Description:** The roles and effects of mass media and major works exemplifying the practice of journalism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 820 Financial Communications****Crosslisted with:** JOMC 420**Notes:** This is an eight-week, asynchronous, online course.**Description:** Understanding and writing about corporate, economic and business topics as journalists or as public relations professionals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

JOMC 822 Race, Gender, and Media**Crosslisted with:** JOMC 422

Description: Multicultural and gender diversity issues within the mass media. Broadcast news, print, and advertising media messages of racial, ethnic, and gender based minorities including African Americans, Hispanic Americans, Asian Americans, Native Americans, and women. Open to non-College of Journalism and Mass Communications majors.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 844 Science Writing****Crosslisted with:** JOMC 444, ALEC 444**Prerequisites:** Permission.**Notes:** Open to all majors. Articles may be submitted for publication.

Description: Advanced writing about science for the non-expert and/or for the general public. Issues in science communication through reading the best writers in science and journalism. Research and write short articles and longer profiles about science and scientists at the University of Nebraska-Lincoln (UNL) and elsewhere. Polish writing skills for doing work in science classes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 885 Mass Media History****Crosslisted with:** JOMC 485**Prerequisites:** Junior standing; major in advertising and public relations, broadcasting, or journalism

Description: History of American mass media in cultural and philosophical contexts; the evolution of mass media as a social institution.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 886 Mass Media Law****Crosslisted with:** JOMC 486**Prerequisites:** Junior standing; major in ADPR, BRDC, or JOUR.

Description: Legal basis for freedom of speech and press. Limitations imposed upon rights by statute, common law and court decisions. Resolving conflicts between those rights and other constitutional rights. Enhancing critical-thinking and writing skills. Roles, rights, and responsibilities of mass media in a free society through analysis of cases.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 887 Mass Media and Society****Crosslisted with:** JOMC 487**Prerequisites:** Senior standing; major in ADPR, BRDC or JOUR

Notes: Required of all students seeking a degree through the College of Journalism and Mass Communications.

Description: Interrelationships between the American mass media and society, integrating ethics, theories and contemporary issues.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOMC 891 Special Topics****Crosslisted with:** JOMC 491, ANTH 491A, ANTH 891A

Notes: 12 hours max special topics hours at all levels (100, 200, 300, 400) per degree. May be repeated up to three times so long as the topics are different.

Description: Topics vary each term.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC

Journalism (JOUR)

JOUR 801 Depth Reporting**Crosslisted with:** JOUR 401**Prerequisites:** JOUR 302

Notes: Work will appear on the student news World Wide Web (WWW) site. Letter grade only.

Description: Long-form writing, interviewing, computer-generated research, refined writing and teamwork in the creation of a single-subject project.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**JOUR 804 Digital Photojournalism/Multimedia I****Crosslisted with:** JOUR 404**Prerequisites:** JOMC 101 and JOMC 130-134.

Notes: Student work will appear on student news World Wide Web (WWW) site.

Description: News, feature, sports and picture-story journalism.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**Prerequisite for:** JOUR 406, JOUR 806**JOUR 806 Digital Photojournalism/Multimedia II****Crosslisted with:** JOUR 406**Prerequisites:** JOUR 404/804

Notes: Work will appear on the student news World Wide Web (WWW) site.

Description: Building visual skills to recognize action, reaction and/or emotion, and incorporating them into the shootings and pictures.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 807 Data Visualization****Crosslisted with:** JOUR 407**Prerequisites:** JOUR 202

Description: Storytelling with visuals generated from data. Theory and practice of visualization and analysis basics.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

JOUR 810 Page Design**Crosslisted with:** JOUR 410**Prerequisites:** JOMC 130-134 and JOUR 201.**Description:** Designing elements of news presentation, including newspapers, magazines, and web sites.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 813 Media Economics****Description:** Economic theory applied to analysis of mass media industries. Structure, performance, and competitions across print media, advertising, broadcasting, and new digital media. Preparation for conducting economic analyses of mass media behavior and performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 814 Government Controls of Information****Crosslisted with:** JOUR 414**Description:** Laws, regulations, and practices by which federal, state, and local government enhance or retard access to information about the executive, legislative, and judicial branches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 846 Nebraska Mosaic****Crosslisted with:** JOUR 446**Prerequisites:** JOUR 202, JOUR 302 and JOUR 304 or BRDC 371 or BRDC 369 and BRDC 370 and JOUR 304.**Description:** Create and present news and information of particular interest to Lincoln's growing refugee communities. The stories students report will be presented on the Nebraska Mosaic website (www.nemosaic.org), and they may also be re-purposed as part of printed newsletters or video projects distributed on DVD.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 867 School Publications****Crosslisted with:** JOUR 467**Notes:** Open only to students seeking a 7-12 journalism teaching endorsement.**Description:** Problems and procedures involved in producing school newspapers, yearbooks, literary magazines, and radio and/or video projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JOUR 890 Global Multimedia Photojournalism Project****Crosslisted with:** JOUR 490**Prerequisites:** JOUR 404.**Description:** Research and then visit a selected country and produce a multimedia story dealing with an emerging country in which there is need. Spend eight weeks conducting story research on campus then travel to the country either during winter break or in May. Spend three weeks in the country while working on the story then finish writing and editing after returning to Nebraska.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**JOUR 891 Special Topics****Crosslisted with:** JOUR 491**Notes:** 12 hours max special topics hours at all levels (100, 200, 300, 400) per degree**Description:** Topics vary each term.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**JOUR 897 Nebraska News Service****Crosslisted with:** JOUR 497**Prerequisites:** Complete all required 100-level courses and JOUR 201, JOUR 202 and JOUR 302.**Notes:** Contact instructor for application.**Description:** The Nebraska News Service functions as a statehouse news bureau for client news organizations throughout the state, generating original spot news and enterprise stories as well as responding to specific story requests from news service clients.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

Journalism - Graduate (JGRD)

JGRD 809 Media Law Seminar**Prerequisites:** Permission**Description:** Reading, discussion, and research on current issues in mass media law or theoretical bases for freedom of expression.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**JGRD 811 Seminar in Media History****Description:** Readings and discussion of major issues, events, and people in the history of mass media in the United States.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

JGRD 819 Graduate Writing, Reporting and Editing

Description: This course teaches, at an accelerated graduate level, the principles and practices of reporting, writing and editing. It includes discussion of the ethical principles of journalism and the application of basic statistics the development of news and feature work.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 820 Mass Media: Introduction

Prerequisites: Permission

Description: Mass media structure, development, systems, responsibilities and ethics, and criticisms.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 831 Strategic Communications: Writing and Design

Description: Seminar for graduate students who do not have an undergraduate degree in advertising. Strategic and creative components of advertising, both from the visual and textual perspectives. Specific strategies for writing and designing advertising, promotional and public relations materials; creative aspects related to strategic planning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 835 International Communications

Prerequisites: Permission

Description: Systems of mass communications in foreign countries and across international boundaries.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 891 Special Topics

Description: Topics vary. Course may be repeated up to three times so long as topics are different.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 12

Format: LEC

JGRD 896 Independent Study

Prerequisites: Permission of major adviser

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: IND

JGRD 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 99

Format: IND

JGRD 901 Ethics and Issues in Mass Communication

Description: Ethical framework for exploring current issues in mass communications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 902 Multi-platform Journalism

Description: Skills and technologies involved with multi-platform journalism and management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 903 Entrepreneurial Journalism

Description: Current issues in business management related to the media environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 915 Mass Communication Theory

Description: Process and effects of mass communication.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 919 Methods of Mass Communication Research

Description: Research concepts and procedures with emphasis on methodology and research techniques in mass communication. Development of competency in consumption and interpretation of research combined with an introduction to research design, analysis, and decision making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 954 MASS MEDIA & GOVT

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

JGRD 992 Professional Project

Description: Development of thesis topic may come from JGRD 992.

JGRD 992 is designed for increasing competency in professional practice and depending on goals, may be concentrated in ADVT, BRDC, or NEWS.

Translation of social, political, and economic affairs to mass audiences in both print and electronic media.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

JGRD 995 Issues in Mass Communication

Description: Current problems in mass communication and interrelated social, economic, and political factors. Topic varies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Judaic Studies Program (JUDS)

JUDS 892 Advanced Special Topics in Jewish Studies

Crosslisted with: JUDS 492

Prerequisites: Junior/senior/grad standing

Notes: Letter grade only

Description: Advanced seminar on special topics taught by Jewish Studies faculty. Typically requires a substantial research project.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Landscape Architecture (LARC)

LARC 597 Selected Topics in Landscape Architecture

Crosslisted with: LARC 397, LARC 497

Prerequisites: Permission.

Description: Group investigation of a topic in landscape architecture.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 24

Format: LEC

Latin (LATN)

LATN 856 Latin of the Middle Ages

Crosslisted with: LATN 456

Description: Selections from representative authors.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

LATN 891 Topics in Latin Prose

Crosslisted with: LATN 491

Description: Readings from Latin prose masterpieces, Topics vary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

LATN 892 Topics in Latin Poetry

Crosslisted with: LATN 492

Description: Readings from Latin verse masterpieces, Topics vary.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

LATN 896 Reading and Research

Prerequisites: Permission

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

LATN 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

LATN 941 Seminar in Latin Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

Law (LAW)

Students enrolling as both Graduate and Law should note that several LAW courses have a G version and a non-G version, like 501 and 501G, and consult an advisor to ensure that they select the correct courses.

LAW 501 Contracts I

Crosslisted with: LAW 501G

Notes: This is a 2-semester course: Part II is Contracts II (Law 502/502G) and is offered each spring.

Description: Basic principles governing the creation, interpretation and enforcement of private agreements. Offer and acceptance, consideration, the effect of changed or unforeseen circumstances, conditions and remedies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

LAW 501G Contracts I

Crosslisted with: LAW 501

Notes: This is a 2-semester course: Part II is Contracts II (Law 502/502G) and is offered each spring.

Description: Basic principles governing the creation, interpretation and enforcement of private agreements. Offer and acceptance, consideration, the effect of changed or unforeseen circumstances, conditions and remedies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

LAW 502 Contracts II**Crosslisted with:** LAW 502G**Notes:** This is a 2 semester course. Part I is Contracts I, Law 501/501G and is offered in the fall semester only.**Description:** Basic principles governing the creation, interpretation and enforcement of private agreements. Offer and acceptance, consideration, the effect of changed or unforeseen circumstances, conditions and remedies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 502G Contracts II****Crosslisted with:** LAW 502**Notes:** This is a 2 semester course. Part I is Contracts I, Law 501/501G and is offered in the fall semester only.**Description:** Basic principles governing the creation, interpretation and enforcement of private agreements. Offer and acceptance, consideration, the effect of changed or unforeseen circumstances, conditions and remedies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 503 Torts I****Crosslisted with:** LAW 503G**Description:** Legal protection afforded in civil proceedings against interference with the security of one's person, property, relations, and other intangible interests. Substantive principles that govern tort claims (ranging from claims for intentional wrongdoing, to negligence claims, to claims that the defendant is strictly liable for harms caused to the plaintiff), and the theoretical bases and practical implications of such claims.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 503G Torts I****Crosslisted with:** LAW 503**Description:** Legal protection afforded in civil proceedings against interference with the security of one's person, property, relations, and other intangible interests. Substantive principles that govern tort claims (ranging from claims for intentional wrongdoing, to negligence claims, to claims that the defendant is strictly liable for harms caused to the plaintiff), and the theoretical bases and practical implications of such claims.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 505 Property I****Crosslisted with:** LAW 505G**Notes:** This is a 2 semester course. Part II is Property II, Law 506/506G and is offered in the spring semester only.**Description:** Problems in possession, gifts of personal property, bona fide purchasers of personal property, estates in land, landlord and tenant, the modern land transaction, controlling the use of land, easements, licenses and equitable servitudes and constitutional limitations on the power of government to restrict individual economic liberties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 505G Property I****Crosslisted with:** LAW 505**Notes:** This is a 2 semester course. Part II is Property II, Law 506/506G and is offered in the spring semester only.**Description:** Problems in possession, gifts of personal property, bona fide purchasers of personal property, estates in land, landlord and tenant, the modern land transaction, controlling the use of land, easements, licenses and equitable servitudes and constitutional limitations on the power of government to restrict individual economic liberties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 506 Property II****Crosslisted with:** LAW 506G**Notes:** This is a 2 semester course. Part I is Property I, Law 505/505G and is offered in the fall semester only.**Description:** Problems in possession, gifts of personal property, bona fide purchasers of personal property, estates in land, landlord and tenant, the modern land transaction, controlling the use of land, easements, licenses and equitable servitudes and constitutional limitations on the power of government to restrict individual economic liberties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 506G Property II****Crosslisted with:** LAW 506**Notes:** This is a 2 semester course. Part I is Property I, Law 505/505G and is offered in the fall semester only.**Description:** Problems in possession, gifts of personal property, bona fide purchasers of personal property, estates in land, landlord and tenant, the modern land transaction, controlling the use of land, easements, licenses and equitable servitudes and constitutional limitations on the power of government to restrict individual economic liberties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 508 Criminal Law**Crosslisted with:** LAW 508G**Description:** Substantive criminal law, focusing on the theoretical foundations, general principles, and doctrines that govern the rules of liability and defenses, both in the common law tradition and under the Model Penal Code.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 508G Criminal Law****Crosslisted with:** LAW 508**Description:** Substantive criminal law, focusing on the theoretical foundations, general principles, and doctrines that govern the rules of liability and defenses, both in the common law tradition and under the Model Penal Code.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 513 Legal Research and Writing****Crosslisted with:** LAW 513G**Notes:** Students must also take Law 514/G (4 cr hr) which is offered in the spring semester only.**Description:** The emphasis of this course is on the development of legal research and writing skills; writing is the lawyer's most commonly used skill, and effective writing rests on effective research. Communicating like a lawyer, however, means not only communicating professionally but also conducting oneself ethically. In addition to providing sustained and intensive instruction on legal research and writing, this course introduces students to many facets of professionalism and to the skills necessary to make ethical and professional choices.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 513G Legal Research and Writing****Crosslisted with:** LAW 513**Notes:** Students must also take Law 514/G (4 cr hr) which is offered in the spring semester only.**Description:** The emphasis of this course is on the development of legal research and writing skills; writing is the lawyer's most commonly used skill, and effective writing rests on effective research. Communicating like a lawyer, however, means not only communicating professionally but also conducting oneself ethically. In addition to providing sustained and intensive instruction on legal research and writing, this course introduces students to many facets of professionalism and to the skills necessary to make ethical and professional choices.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 514 Legal Research and Writing****Crosslisted with:** LAW 514G**Notes:** This course is a continuation of Law 513/G, which is a fall semester course only.**Description:** The emphasis of this course is on the development of legal research and writing skills; writing is the lawyer's most commonly used skill, and effective writing rests on effective research. Communicating like a lawyer, however, means not only communicating professionally but also conducting oneself ethically. In addition to providing sustained and intensive instruction on legal research and writing, this course introduces students to many facets of professionalism and to the skills necessary to make ethical and professional choices.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**LAW 514G Legal Research and Writing****Crosslisted with:** LAW 514**Notes:** This course is a continuation of Law 513/G, which is a fall semester course only.**Description:** The emphasis of this course is on the development of legal research and writing skills; writing is the lawyer's most commonly used skill, and effective writing rests on effective research. Communicating like a lawyer, however, means not only communicating professionally but also conducting oneself ethically. In addition to providing sustained and intensive instruction on legal research and writing, this course introduces students to many facets of professionalism and to the skills necessary to make ethical and professional choices.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**LAW 516 Civil Procedure I****Crosslisted with:** LAW 516G**Notes:** This is a 2 semester course. Part II is Civil Procedure II, Law 517/517G and is offered in the spring semester only.**Description:** Introduction to federal and state court organization, jurisdiction, and procedure. Emphasis on pre-trial, trial, and post-trial procedures, including pleading, enforcement of judgements, motion practice, appellate review, and the effects of res judicata and collateral estoppel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 729, LAW 729G

LAW 516G Civil Procedure I**Crosslisted with:** LAW 516**Notes:** This is a 2 semester course. Part II is Civil Procedure II, Law 517/517G and is offered in the spring semester only.**Description:** Introduction to federal and state court organization, jurisdiction, and procedure. Emphasis on pre-trial, trial, and post-trial procedures, including pleading, enforcement of judgements, motion practice, appellate review, and the effects of res judicata and collateral estoppel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 729, LAW 729G**LAW 517 Civil Procedure II****Crosslisted with:** LAW 517G**Notes:** This is a 2 semester course. Part I is Civil Procedure I, Law 516/516G and is offered in the fall semester only.**Description:** Introduction to federal and state court organization, jurisdiction, and procedure. Emphasis on pre-trial, trial, and post-trial procedures, including pleading, enforcement of judgements, motion practice, appellate review, and the effects of res judicata and collateral estoppel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 729, LAW 729G**LAW 517G Civil Procedure II****Crosslisted with:** LAW 517**Notes:** This is a 2 semester course. Part I is Civil Procedure I, Law 516/516G and is offered in the fall semester only.**Description:** Introduction to federal and state court organization, jurisdiction, and procedure. Emphasis on pre-trial, trial, and post-trial procedures, including pleading, enforcement of judgements, motion practice, appellate review, and the effects of res judicata and collateral estoppel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 729, LAW 729G**LAW 518 International Perspectives in U.S. Legal System: Practicing Law in a Global Legal Environment****Crosslisted with:** LAW 518G**Description:** Prepare for legal practice in a global legal environment, including an understanding of how to handle the treaty and foreign law issues that can arise in the practice of virtually every area of law. The sources of international law and the relationship of international law (particularly treaties) to the U.S. legal system. An overview of conflict of law rules, a survey of differences in the major legal systems of the world, and comparative examination of how foreign legal systems regulate other areas of law studied in the first year, such as torts, contracts, property, and civil procedure.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 518G International Perspectives in U.S. Legal System: Practicing Law in a Global Legal Environment****Crosslisted with:** LAW 518**Description:** Prepare for legal practice in a global legal environment, including an understanding of how to handle the treaty and foreign law issues that can arise in the practice of virtually every area of law. The sources of international law and the relationship of international law (particularly treaties) to the U.S. legal system. An overview of conflict of law rules, a survey of differences in the major legal systems of the world, and comparative examination of how foreign legal systems regulate other areas of law studied in the first year, such as torts, contracts, property, and civil procedure.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 579 Corporate Governance Seminar****Crosslisted with:** LAW 579G**Prerequisites:** Law 632 Business Associations**Description:** Focus on manner in which U.S. publicly traded companies make decisions - particularly interactions between shareholders, the board of directors, top executives, and outside professionals. Overview of current governance and case studies. Discussion on evaluating governance reforms, corporate social responsibility, ethical obligation of attorneys who advise public companies and practice as transactional lawyers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 579G Corporate Governance Seminar**Crosslisted with:** LAW 579**Prerequisites:** Law 632 Business Associations

Description: Focus on manner in which U.S. publicly traded companies make decisions - particularly interactions between shareholders, the board of directors, top executives, and outside professionals. Overview of current governance and case studies. Discussion on evaluating governance reforms, corporate social responsibility, ethical obligation of attorneys who advise public companies and practice as transactional lawyers.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 580 Intro to Federal Contract Law****Crosslisted with:** LAW 580G

Description: Provides an overview of Government Contract Law, indentifying key provisions of applicable law, regulations and general federal acquisitions contract principles. Looks at the authority of contracting officers and how authority is delegated and the impact of such delegation. Provide a basic understanding of the phases of the acquisition lifecycle including: pre-award, solicitation, award, and post-award legal issues. Federal government contract funding and fiscal matters, labor, socioeconomic policies and fraud also examined.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 580G Intro to Federal Contract Law****Crosslisted with:** LAW 580

Description: Provides an overview of Government Contract Law, indentifying key provisions of applicable law, regulations and general federal acquisitions contract principles. Looks at the authority of contracting officers and how authority is delegated and the impact of such delegation. Provide a basic understanding of the phases of the acquisition lifecycle including: pre-award, solicitation, award, and post-award legal issues. Federal government contract funding and fiscal matters, labor, socioeconomic policies and fraud also examined.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 581 Comparative Chinese Law and Culture****Crosslisted with:** LAW 581G

Description: A comparison of Chinese law and Culture with American law and culture. Students will spend two weeks in China with instruction from both Chinese and American law professors and visits to Chinese legal institutions. A paper will be required, the nature of which will depend on whether the student is seeking 2 or 3 credit hours.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**LAW 581G Comparative Chinese Law and Culture****Crosslisted with:** LAW 581

Description: A comparison of Chinese law and Culture with American law and culture. Students will spend two weeks in China with instruction from both Chinese and American law professors and visits to Chinese legal institutions. A paper will be required, the nature of which will depend on whether the student is seeking 2 or 3 credit hours.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**LAW 582 Domestic CyberSecurity****Crosslisted with:** LAW 582G

Description: Cybersecurity is one of the most important and challenging emerging legal issues of the 21st century. Networked computer systems give bad actors access to data and information stored on those systems (e.g., consumer financial or health information; trade secrets and other sensitive commercial information), control over the systems themselves (e.g., to damage or disrupt; to use for other computer-based activities), and access to physical-world control systems (e.g., control over industrial equipment, electrical infrastructure, or driverless cars). Amazingly, there is no coherent legal framework to address these issues. There is, however, an at-times incomplete and at-times overlapping patchwork of legal authorities that applies to many of them. Moreover, many of these issues implicate technical considerations: either technology makes it more difficult for the law to address them, or they are better solved by technology than through the law. This class provides students with an interdisciplinary introduction to cybersecurity law, focusing on the legal frameworks that exist today, the challenges of developing more comprehensive legal frameworks, and the nuts-and-bolts guidance that lawyers need to be able to give their clients when it comes to good (and bad) cybersecurity practices.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 582G Domestic CyberSecurity**Crosslisted with:** LAW 582

Description: Cybersecurity is one of the most important and challenging emerging legal issues of the 21st century. Networked computer systems give bad actors access to data and information stored on those systems (e.g., consumer financial or health information; trade secrets and other sensitive commercial information), control over the systems themselves (e.g., to damage or disrupt; to use for other computer-based activities), and access to physical-world control systems (e.g., control over industrial equipment, electrical infrastructure, or driverless cars). Amazingly, there is no coherent legal framework to address these issues. There is, however, an at-times incomplete and at-times overlapping patchwork of legal authorities that applies to many of them. Moreover, many of these issues implicate technical considerations: either technology makes it more difficult for the law to address them, or they are better solved by technology than through the law. This class provides students with an interdisciplinary introduction to cybersecurity law, focusing on the legal frameworks that exist today, the challenges of developing more comprehensive legal frameworks, and the nuts-and-bolts guidance that lawyers need to be able to give their clients when it comes to good (and bad) cybersecurity practices.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 583 Corporate & Securities Law Seminar****Crosslisted with:** LAW 583G**Prerequisites:** LAW 632

Notes: Securities Regulation is not a prerequisite and the instructor will not assume students have any background in securities law.

Description: Selected issues in corporate and securities law. Theories of the corporation, corporate governance, corporate and securities litigation, and small business financing. Students may write papers on any topic within the broad area of corporate and securities law, whether or not listed above, with "corporate" law defined to include non-corporate entities as well.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 583G Corporate & Securities Law Seminar****Crosslisted with:** LAW 583**Prerequisites:** LAW 632

Notes: Securities Regulation is not a prerequisite and the instructor will not assume students have any background in securities law.

Description: Selected issues in corporate and securities law. Theories of the corporation, corporate governance, corporate and securities litigation, and small business financing. Students may write papers on any topic within the broad area of corporate and securities law, whether or not listed above, with "corporate" law defined to include non-corporate entities as well.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 584 Secured Transactions Seminar****Crosslisted with:** LAW 584G

Description: An overview of the rights and obligations of an unsecured creditor under state law with focus on the rights and obligations of a secured creditor under Article 9 of the Uniform Commercial Code. Consider relationship between debtor and secured creditor by examining statutory requirements for granting a security interest in personal property and the rights of the secured creditor when the debtor defaults on its obligations. Learn how relationship between debtor and creditor impacts other creditors of the debtor. Study of the filing system used for perfection of security interest and the priority rules for resolving conflicts between the various creditors of a debtor. Learn the fundamental bankruptcy concepts.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 584G Secured Transactions Seminar****Crosslisted with:** LAW 584

Description: An overview of the rights and obligations of an unsecured creditor under state law with focus on the rights and obligations of a secured creditor under Article 9 of the Uniform Commercial Code. Consider relationship between debtor and secured creditor by examining statutory requirements for granting a security interest in personal property and the rights of the secured creditor when the debtor defaults on its obligations. Learn how relationship between debtor and creditor impacts other creditors of the debtor. Study of the filing system used for perfection of security interest and the priority rules for resolving conflicts between the various creditors of a debtor. Learn the fundamental bankruptcy concepts.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 585 Litigation Capstone: Labor and Employment Focus**Crosslisted with:** LAW 585G**Prerequisites:** At least one of: Law 647G or Law 680G or Law 753G**Notes:** Much of the students' work will be self-directed, but classroom sessions will offer opportunities for instruction and coaching of student performance of practice skills from experienced labor and employment attorneys. Class sessions may be scheduled for times other than the time that appears on the course schedule.**Description:** Hands-on experience integrating a wide-range of employment and labor law doctrine with practice skills and professional ethics. Students will be divided into attorney teams to represent a particular client in a simulated dispute. The client's student attorney team will decide how to pursue potential claims or how to defend claims brought against the client. Claims may include unfair labor practice proceedings before the National Labor Relations Board, employment discrimination and sexual harassment charges before the Equal Employment Opportunity Commission and in litigation, arbitration of employee discipline under a collective bargaining agreement, arbitration under non-union employment contracts, defamation, and claims under the Family and Medical Leave Act and ERISA. During the term, students may experience interviewing and counseling clients, filing claims with administrative agencies, conducting research in labor and employment law, drafting pleadings and legal memoranda, negotiations, engaging in discovery, and representing clients in arbitration, mediation and litigation motion practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 585G Litigation Capstone: Labor and Employment Focus****Crosslisted with:** LAW 585**Prerequisites:** At least one of: Law 647G or Law 680G or Law 753G**Notes:** Much of the students' work will be self-directed, but classroom sessions will offer opportunities for instruction and coaching of student performance of practice skills from experienced labor and employment attorneys. Class sessions may be scheduled for times other than the time that appears on the course schedule.**Description:** Hands-on experience integrating a wide-range of employment and labor law doctrine with practice skills and professional ethics. Students will be divided into attorney teams to represent a particular client in a simulated dispute. The client's student attorney team will decide how to pursue potential claims or how to defend claims brought against the client. Claims may include unfair labor practice proceedings before the National Labor Relations Board, employment discrimination and sexual harassment charges before the Equal Employment Opportunity Commission and in litigation, arbitration of employee discipline under a collective bargaining agreement, arbitration under non-union employment contracts, defamation, and claims under the Family and Medical Leave Act and ERISA. During the term, students may experience interviewing and counseling clients, filing claims with administrative agencies, conducting research in labor and employment law, drafting pleadings and legal memoranda, negotiations, engaging in discovery, and representing clients in arbitration, mediation and litigation motion practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 586 Disaster Law Seminar****Crosslisted with:** LAW 586G**Description:** Exploration of issues that arise before, during and after catastrophic disasters. Using real-life case studies, students will assess legal tools for reducing vulnerability, enhancing emergency preparedness and response, and increasing environmental protection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 586G Disaster Law Seminar****Crosslisted with:** LAW 586**Description:** Exploration of issues that arise before, during and after catastrophic disasters. Using real-life case studies, students will assess legal tools for reducing vulnerability, enhancing emergency preparedness and response, and increasing environmental protection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 587 Law & Behavioral Science Seminar****Crosslisted with:** LAW 587G**Description:** Actual and potential uses of science in the law. The course primarily focuses on social science but considers general principles that apply to all types of science in the law. Specifically, we will look at the use of social science as fact in litigation (e.g., consumer confusion and civil damages) and as context in litigation (e.g., syndromes and criminal defenses). A secondary objective is to look at how social science can be used to understand the more general function and purpose of the courts and more specifically the application of various legal practices and policies to social problems. Third, the course examines the concept of junk science in the law including the misuse of science in litigation and legislation. Throughout the course, we will consider how empirical research can shed light on matters of importance to the legal system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 587G Law & Behavioral Science Seminar****Crosslisted with:** LAW 587**Description:** Actual and potential uses of science in the law. The course primarily focuses on social science but considers general principles that apply to all types of science in the law. Specifically, we will look at the use of social science as fact in litigation (e.g., consumer confusion and civil damages) and as context in litigation (e.g., syndromes and criminal defenses). A secondary objective is to look at how social science can be used to understand the more general function and purpose of the courts and more specifically the application of various legal practices and policies to social problems. Third, the course examines the concept of junk science in the law including the misuse of science in litigation and legislation. Throughout the course, we will consider how empirical research can shed light on matters of importance to the legal system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

LAW 588 Family Mediation**Crosslisted with:** LAW 588G**Prerequisites:** Mediation or another ODR-approved Basic Mediation Training**Notes:** This course is not available to first-year students.**Description:** Family Mediation is a simulation-based class that meets the Nebraska Supreme Court's Office of Dispute Resolution for an approved 30 training hours requirement to be a Parenting Act mediator under the Nebraska Parenting Act. Issues involving family conflict, focusing on mediating and developing Parenting Plans for parents who are divorcing, separating, or in paternity actions.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 588G Family Mediation****Crosslisted with:** LAW 588**Prerequisites:** Mediation or another ODR-approved Basic Mediation Training**Notes:** This course is not available to first-year students.**Description:** Family Mediation is a simulation-based class that meets the Nebraska Supreme Court's Office of Dispute Resolution for an approved 30 training hours requirement to be a Parenting Act mediator under the Nebraska Parenting Act. Issues involving family conflict, focusing on mediating and developing Parenting Plans for parents who are divorcing, separating, or in paternity actions.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 589 Introduction to Compliance****Crosslisted with:** LAW 589G**Description:** Focuses on the framework underlying the recent surge in compliance programs and an overview of the relationship between corporate governance, risk and compliance. Identify common features of a compliance program and examine specific regulations affecting corporate compliance, such as Sarbanes-Oxley, SEC investigations, anti-money laundering, data protection, consumer finance, anti-corruption laws (such as the Foreign Corrupt Practices Act) and health care. Discuss the role of a compliance officer and the coordination and integration of counsel and other experts, such as accountants. Exploration of ethical considerations of a compliance program, such as privilege and confidentiality and the role of legal counsel versus the compliance officer, and will emphasize building a culture of compliance in an organization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 589G Introduction to Compliance****Crosslisted with:** LAW 589**Description:** Focuses on the framework underlying the recent surge in compliance programs and an overview of the relationship between corporate governance, risk and compliance. Identify common features of a compliance program and examine specific regulations affecting corporate compliance, such as Sarbanes-Oxley, SEC investigations, anti-money laundering, data protection, consumer finance, anti-corruption laws (such as the Foreign Corrupt Practices Act) and health care. Discuss the role of a compliance officer and the coordination and integration of counsel and other experts, such as accountants. Exploration of ethical considerations of a compliance program, such as privilege and confidentiality and the role of legal counsel versus the compliance officer, and will emphasize building a culture of compliance in an organization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 602 Elder Law****Crosslisted with:** LAW 602G**Description:** Addresses the legal concerns and issues facing the rapidly growing subpopulation of older adults. Topics covered in the course will include the legal and social science aspects of: ethical issues related to client legal capacity, health care decision making, Medicare, Medicaid, Social Security, long-term informal and formal care (including guardianship), financial aspects of aging, ageism, and elder maltreatment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 602G Elder Law****Crosslisted with:** LAW 602**Description:** Addresses the legal concerns and issues facing the rapidly growing subpopulation of older adults. Topics covered in the course will include the legal and social science aspects of: ethical issues related to client legal capacity, health care decision making, Medicare, Medicaid, Social Security, long-term informal and formal care (including guardianship), financial aspects of aging, ageism, and elder maltreatment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 603 Law Office Management**Crosslisted with:** LAW 603G

Description: Issues confronted by the small firm and/or sole practitioner. Firm organization, e.g., partnerships, professional corporations, limited liability companies, limited liability partnerships and partnership and shareholder agreements. The role of partners, shareholders, associates and non-lawyer staff, e.g., law clerks paralegals and legal secretaries. Ethical issues involved in the marketing of legal services, firm financial matters and dealing with clients within the organizational structure. Managing the legal product as well as physical resource needs such as traditional libraries through electronic information resources.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 603G Law Office Management****Crosslisted with:** LAW 603

Description: Issues confronted by the small firm and/or sole practitioner. Firm organization, e.g., partnerships, professional corporations, limited liability companies, limited liability partnerships and partnership and shareholder agreements. The role of partners, shareholders, associates and non-lawyer staff, e.g., law clerks paralegals and legal secretaries. Ethical issues involved in the marketing of legal services, firm financial matters and dealing with clients within the organizational structure. Managing the legal product as well as physical resource needs such as traditional libraries through electronic information resources.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 604 NATL MOOT COURT TEAM****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** IND**Offered:** SPRING**LAW 605 Law Review Research****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Offered:** ALL**LAW 606 National Trial Team****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** IND**Offered:** FALL**LAW 607 Teaching Assistant (TA)****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**Offered:** SPRING**LAW 608 Semester Externship****Credit Hours:** 9-12**Min credits per semester:** 9**Max credits per semester:** 12**Max credits per degree:** 12**Format:** FLD**Offered:** FALL/SPR**LAW 609 Constitutional Law I****Crosslisted with:** LAW 609G

Description: Provides a general overview of the structure of the federal government, including the history and judicial interpretation of the Constitution, the limited jurisdiction of the federal courts and the impact that has on the cases that they hear, federalism concerns, interstate commerce, due process, equal protection and separation of powers.

Credit Hours: 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 729, LAW 729G**LAW 609G Constitutional Law I****Crosslisted with:** LAW 609

Description: Provides a general overview of the structure of the federal government, including the history and judicial interpretation of the Constitution, the limited jurisdiction of the federal courts and the impact that has on the cases that they hear, federalism concerns, interstate commerce, due process, equal protection and separation of powers.

Credit Hours: 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 729, LAW 729G**LAW 610 Appellate Advocacy****Crosslisted with:** LAW 610G

Description: Appellate Practice & Procedure. Explores federal and Nebraska appellate practice, including the mechanics and timing of appeals, with an emphasis on written and oral advocacy. Draft appellate briefs, prepare other appeal-related documents and participate in an oral argument.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 610G Appellate Advocacy****Crosslisted with:** LAW 610

Description: Appellate Practice & Procedure. Explores federal and Nebraska appellate practice, including the mechanics and timing of appeals, with an emphasis on written and oral advocacy. Draft appellate briefs, prepare other appeal-related documents and participate in an oral argument.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 612 Law and Storytelling Seminar**Crosslisted with:** LAW 612G**Prerequisites:** Cannot have taken Law & Literature, LAW 712G.**Notes:** Cannot have taken Law & Literature, LAW 712G.**Description:** Examines the role of storytelling in The Law. Novelists, poets, and playwrights dramatize the law and legal events in ways that the bare fact patterns of case law cannot. Read literature that examines "the law" as an object of fascination and revulsion. Examine legal texts using the tools of literary analysis and explore the literary aspects of the law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 612G Law and Storytelling Seminar****Crosslisted with:** LAW 612**Prerequisites:** Cannot have taken Law & Literature, LAW 712G.**Notes:** Cannot have taken Law & Literature, LAW 712G.**Description:** Examines the role of storytelling in The Law. Novelists, poets, and playwrights dramatize the law and legal events in ways that the bare fact patterns of case law cannot. Read literature that examines "the law" as an object of fascination and revulsion. Examine legal texts using the tools of literary analysis and explore the literary aspects of the law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 613 Electronic Commerce****Crosslisted with:** LAW 613G**Description:** Focused on the legal and policy issues in digital transactions and the various problems with legal advice for the business owner on a variety of topics, including: choice of business model; protecting digital assets; digital contracts; electronic payments; financing intellectual property and other digital assets, consumer protection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 613G Electronic Commerce****Crosslisted with:** LAW 613**Description:** Focused on the legal and policy issues in digital transactions and the various problems with legal advice for the business owner on a variety of topics, including: choice of business model; protecting digital assets; digital contracts; electronic payments; financing intellectual property and other digital assets, consumer protection.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 615 Entertainment Law****Crosslisted with:** LAW 615G**Description:** Comprehensive survey and analysis of the laws governing the entertainment industry, artists, and their representatives. Learn about legal restraints on entertainment, including censorship of sex and violence, defamation, and privacy and publicity rights. Covers intellectual property in entertainment assets: copyright, trademark, artistic credits, and "moral rights." Acquire a working vocabulary of important entertainment transactions, such as publishing agreements, film and television option agreements, and agent and personal management contracts. Includes hands-on analysis of entertainment contracts, especially in the publishing, movie, and television industries.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 615G Entertainment Law****Crosslisted with:** LAW 615**Description:** Comprehensive survey and analysis of the laws governing the entertainment industry, artists, and their representatives. Learn about legal restraints on entertainment, including censorship of sex and violence, defamation, and privacy and publicity rights. Covers intellectual property in entertainment assets: copyright, trademark, artistic credits, and "moral rights." Acquire a working vocabulary of important entertainment transactions, such as publishing agreements, film and television option agreements, and agent and personal management contracts. Includes hands-on analysis of entertainment contracts, especially in the publishing, movie, and television industries.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 616 International Human Rights Law****Crosslisted with:** LAW 616G**Notes:** Students previously enrolled in Seminar (707G) may not enroll in this course.**Description:** Historical, political, religious and philosophical roots of international human rights law, its development over the course of the last century and its contemporary role in international affairs. May include: current attempts to strengthen U.N. fact-finding and implementation mechanisms; the relationship between U.N. peacekeeping and peacemaking and international humanitarian law; the activities of regional human rights systems; the effect of the United States' recent signature and ratification of U.N. human rights conventions and the role of such conventions and international human rights law through the criminal process; and military intervention to protect human rights victims, including NATO's intervention in Kosovo.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 616G International Human Rights Law**Crosslisted with:** LAW 616**Notes:** Students previously enrolled in Seminar (707G) may not enroll in this course.**Description:** Historical, political, religious and philosophical roots of international human rights law, its development over the course of the last century and its contemporary role in international affairs. May include: current attempts to strengthen U.N. fact-finding and implementation mechanisms; the relationship between U.N. peacekeeping and peacemaking and international humanitarian law; the activities of regional human rights systems; the effect of the United States' recent signature and ratification of U.N. human rights conventions and the role of such conventions and international human rights law through the criminal process; and military intervention to protect human rights victims, including NATO's intervention in Kosovo.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 617 Construction Practice****Crosslisted with:** LAW 617G**Description:** In-depth study of the construction process as an example of the initiation, administration, and handling of disputes in a relational contract. Topics covered include practice in the art of drafting contracts, analysis of the performance of the contracting parties, and the resolution of disputes between parties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 617G Construction Practice****Crosslisted with:** LAW 617**Description:** In-depth study of the construction process as an example of the initiation, administration, and handling of disputes in a relational contract. Topics covered include practice in the art of drafting contracts, analysis of the performance of the contracting parties, and the resolution of disputes between parties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 618 Farm & Ranch Taxation****Crosslisted with:** LAW 618G**Prerequisites:** LAW 637G**Notes:** Student grade is based primarily on final examination with a small amount of graded work during the semester.**Description:** A selection of substantial income tax, estate tax and other tax-related problems and issues affecting farmers and ranchers.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 618G Farm & Ranch Taxation****Crosslisted with:** LAW 618**Prerequisites:** LAW 637G**Notes:** Student grade is based primarily on final examination with a small amount of graded work during the semester.**Description:** A selection of substantial income tax, estate tax and other tax-related problems and issues affecting farmers and ranchers.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 619 Constitutional History****Crosslisted with:** LAW 619G**Description:** American constitutional history with a focus on "transformative" moments at which the Constitution and the nature of American politics and government changed. American Revolution and the framing of the Constitution and Bill of Rights, Civil War and Reconstruction, and the New Deal. Exploration of the courts and how they stood on history and original intent when they interpret the Constitution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 619G Constitutional History****Crosslisted with:** LAW 619**Description:** American constitutional history with a focus on "transformative" moments at which the Constitution and the nature of American politics and government changed. American Revolution and the framing of the Constitution and Bill of Rights, Civil War and Reconstruction, and the New Deal. Exploration of the courts and how they stood on history and original intent when they interpret the Constitution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 620 Science and the Law Seminar****Crosslisted with:** LAW 620G**Description:** Analysis of the role of science in the law. This seminar will explore issues such as biotechnology, computers, scientific evidence, regulatory approval, antitrust, and environmental law to explore the intersection of science, technology, and the effect on the law and legal decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 620G Science and the Law Seminar**Crosslisted with:** LAW 620**Description:** Analysis of the role of science in the law. This seminar will explore issues such as biotechnology, computers, scientific evidence, regulatory approval, antitrust, and environmental law to explore the intersection of science, technology, and the effect on the law and legal decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 621 Education Law Seminar****Crosslisted with:** LAW 621G**Description:** An in-depth study of selected current national and state legal issues pertaining to education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 621G Education Law Seminar****Crosslisted with:** LAW 621**Description:** An in-depth study of selected current national and state legal issues pertaining to education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 623 Environmental Ethics and Law Seminar****Crosslisted with:** LAW 623G**Description:** Key theories in environmental ethics and environmental law; enhanced ability to analyze critically and communicate clearly and persuasively in an interdisciplinary forum through writing, informal discussion, and formal presentations; and a deeper understanding of sustainability as a principle of environmental law and ethics especially in agriculturally dominated landscapes. Nature of ethics and its relation to law; climate change; bio-fuels with implications for farm communities, water resources, and food supplies; and genetically modified organisms (GMO's).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 623G Environmental Ethics and Law Seminar****Crosslisted with:** LAW 623**Description:** Key theories in environmental ethics and environmental law; enhanced ability to analyze critically and communicate clearly and persuasively in an interdisciplinary forum through writing, informal discussion, and formal presentations; and a deeper understanding of sustainability as a principle of environmental law and ethics especially in agriculturally dominated landscapes. Nature of ethics and its relation to law; climate change; bio-fuels with implications for farm communities, water resources, and food supplies; and genetically modified organisms (GMO's).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 624 Immigration Law****Crosslisted with:** LAW 624G**Description:** History of immigration to the United States, federal authority to regulate immigration, immigrant visas, nonimmigrant visas, deportation, political asylum, citizenship, rights of aliens in the United States, and ethical issues for immigration lawyers.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 624G Immigration Law****Crosslisted with:** LAW 624**Description:** History of immigration to the United States, federal authority to regulate immigration, immigrant visas, nonimmigrant visas, deportation, political asylum, citizenship, rights of aliens in the United States, and ethical issues for immigration lawyers.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 627 Payment Systems****Crosslisted with:** LAW 627G**Description:** Negotiable instruments, bank collections, negotiable documents, selected aspects of sales, and products liability.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**LAW 627G Payment Systems****Crosslisted with:** LAW 627**Description:** Negotiable instruments, bank collections, negotiable documents, selected aspects of sales, and products liability.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING

LAW 628 Antitrust and Trade Regulation**Crosslisted with:** LAW 628G**Description:** Control of business activities through the federal antitrust laws. Emphasis on monopolies, joint ventures, pricefixing, boycotts, resale price maintenance, exclusive dealing and tying arrangements, territorial restrictions, and mergers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 628G Antitrust and Trade Regulation****Crosslisted with:** LAW 628**Description:** Control of business activities through the federal antitrust laws. Emphasis on monopolies, joint ventures, pricefixing, boycotts, resale price maintenance, exclusive dealing and tying arrangements, territorial restrictions, and mergers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 629 Accounting for Lawyers****Crosslisted with:** LAW 629G**Notes:** Students who have previously taken an accounting course at any level may not enroll in this course.**Description:** Introduction to basic accounting principles and the interaction of law and accounting. Gain an understanding of accounting statements, accounting terminology, and accounting issues you are likely to encounter in legal practice. Students who have previously taken an accounting course at any level may not enroll in this course**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 629G Accounting for Lawyers****Crosslisted with:** LAW 629**Notes:** Students who have previously taken an accounting course at any level may not enroll in this course.**Description:** Introduction to basic accounting principles and the interaction of law and accounting. Gain an understanding of accounting statements, accounting terminology, and accounting issues you are likely to encounter in legal practice. Students who have previously taken an accounting course at any level may not enroll in this course**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 630 Family Law****Crosslisted with:** LAW 630G**Description:** The family examined as a socio-legal entity with respect to its creation, dissolution, and the problems incident to its continuation, including interspousal rights and duties and the relationship between parents and children.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 635, LAW 635G; LAW 686, LAW 686G**LAW 630G Family Law****Crosslisted with:** LAW 630**Description:** The family examined as a socio-legal entity with respect to its creation, dissolution, and the problems incident to its continuation, including interspousal rights and duties and the relationship between parents and children.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 635, LAW 635G; LAW 686, LAW 686G**LAW 631 Criminal Procedure****Crosslisted with:** LAW 631G**Description:** Basic problems of criminal procedure with emphasis on the fourth, fifth, and sixth amendments to the United States Constitution and their impact on the criminal justice system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 631G Criminal Procedure****Crosslisted with:** LAW 631**Description:** Basic problems of criminal procedure with emphasis on the fourth, fifth, and sixth amendments to the United States Constitution and their impact on the criminal justice system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 632 Business Associations****Crosslisted with:** LAW 632G**Description:** Introduction to the law of business associations. Examines the relationships among the various participants in business entities and, to a lesser extent, the relationships between business entities and outsiders.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ACCT 848; LAW 579, LAW 579G; LAW 583, LAW 583G; LAW 636, LAW 636G; LAW 658, LAW 658G; LAW 687, LAW 687G; LAW 723, LAW 723G; LAW 746, LAW 746G; LAW 789, LAW 789G

LAW 632G Business Associations**Crosslisted with:** LAW 632**Description:** Introduction to the law of business associations. Examines the relationships among the various participants in business entities and, to a lesser extent, the relationships between business entities and outsiders.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ACCT 848; LAW 579, LAW 579G; LAW 583, LAW 583G; LAW 636, LAW 636G; LAW 658, LAW 658G; LAW 687, LAW 687G; LAW 723, LAW 723G; LAW 746, LAW 746G; LAW 789, LAW 789G**LAW 633 Administrative Law****Crosslisted with:** LAW 633G**Description:** Origin and growth of the administrative process, the development of administrative law and its impact upon traditional legal institutions, analysis of the types of federal and state administrative tribunals, their powers and functions, and problems of administrative procedure, judicial and other controls upon the administrative process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 633G Administrative Law****Crosslisted with:** LAW 633**Description:** Origin and growth of the administrative process, the development of administrative law and its impact upon traditional legal institutions, analysis of the types of federal and state administrative tribunals, their powers and functions, and problems of administrative procedure, judicial and other controls upon the administrative process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 634 Criminal Adjudication****Crosslisted with:** LAW 634G**Description:** Covers the criminal adjudication process from ¿bail to jail¿ – from the suspect¿s first appearance in court through sentencing and appeal. Topics include right to counsel, pretrial detention and bail, the charging decision, grand juries, discovery, plea bargaining, the right to a speedy trial, jury rights, proof at trial, sentencing, post-conviction review, and double jeopardy. Designed to complement Criminal Procedure, which focuses on the Fourth, Fifth, and Sixth Amendments to the United States Constitution. Material may overlap slightly.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 634G Criminal Adjudication****Crosslisted with:** LAW 634**Description:** Covers the criminal adjudication process from ¿bail to jail¿ – from the suspect¿s first appearance in court through sentencing and appeal. Topics include right to counsel, pretrial detention and bail, the charging decision, grand juries, discovery, plea bargaining, the right to a speedy trial, jury rights, proof at trial, sentencing, post-conviction review, and double jeopardy. Designed to complement Criminal Procedure, which focuses on the Fourth, Fifth, and Sixth Amendments to the United States Constitution. Material may overlap slightly.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 635 Family Law Practice****Crosslisted with:** LAW 635G**Prerequisites:** LAW 630/G**Description:** Emphasizes family law practice skills such as ethics, interviewing, counseling, negotiations, mediation, drafting, discovery, evaluating property, tax problems, and working with other professionals. Work on a simulated upper middle class divorce case that culminates in negotiating a property settlement agreement and parenting plan, and will also process one real low-income non-contested divorce.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** CLN**Offered:** SPRING**LAW 635G Family Law Practice****Crosslisted with:** LAW 635**Prerequisites:** LAW 630/G**Description:** Emphasizes family law practice skills such as ethics, interviewing, counseling, negotiations, mediation, drafting, discovery, evaluating property, tax problems, and working with other professionals. Work on a simulated upper middle class divorce case that culminates in negotiating a property settlement agreement and parenting plan, and will also process one real low-income non-contested divorce.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** CLN**Offered:** SPRING**LAW 636 Corporate Mergers and Acquisitions****Crosslisted with:** LAW 636G**Prerequisites:** LAW 632/G**Description:** Corporate mergers and acquisitions, including tender offers. The history of corporate acquisitions, their rationales, the legal duties of the officers and directors involved, different ways to structure a corporate acquisition, issues in negotiation and contracting, and securities law issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 636G Corporate Mergers and Acquisitions**Crosslisted with:** LAW 636**Prerequisites:** LAW 632/G**Description:** Corporate mergers and acquisitions, including tender offers. The history of corporate acquisitions, their rationales, the legal duties of the officers and directors involved, different ways to structure a corporate acquisition, issues in negotiation and contracting, and securities law issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 637 Taxation-Individual Income Tax****Crosslisted with:** LAW 637G**Description:** The structure and content of the federal income tax system, focusing on taxation of individuals. Income, deductions, income splitting, capital gains, and tax accounting. Technical proficiency in solving tax problems and an understanding of the tax policy decisions implicit in the technical rules.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ACCT 838; ACCT 945; LAW 618, LAW 618G; LAW 638, LAW 638G; LAW 650, LAW 650G; LAW 745, LAW 745G; LAW 767, LAW 767G**LAW 637G Taxation-Individual Income Tax****Crosslisted with:** LAW 637**Description:** The structure and content of the federal income tax system, focusing on taxation of individuals. Income, deductions, income splitting, capital gains, and tax accounting. Technical proficiency in solving tax problems and an understanding of the tax policy decisions implicit in the technical rules.**Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ACCT 838; ACCT 945; LAW 618, LAW 618G; LAW 638, LAW 638G; LAW 650, LAW 650G; LAW 745, LAW 745G; LAW 767, LAW 767G**LAW 638 Taxation-Corporate****Crosslisted with:** LAW 638G**Prerequisites:** LAW 637**Description:** Advanced federal income tax focusing on income taxation of corporations and shareholders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** ACCT 848**LAW 638G Taxation-Corporate****Crosslisted with:** LAW 638**Prerequisites:** Law 637 - Individual Income Tax**Description:** Advanced federal income tax focusing on income taxation of corporations and shareholders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** ACCT 848**LAW 639 Wills and Trusts****Crosslisted with:** LAW 639G**Description:** Intestate succession and related matters, execution of wills, revocation of wills, problems created by the time gap in wills, limitations on the power to devise, construction of wills (mistake and ambiguity), "living wills", durable powers of attorney, health care directives, the elements of trust, formalities in the creation of a trust, the interest of the beneficiary, charitable trusts and problems of trust administration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 767, LAW 767G**LAW 639G Wills and Trusts****Crosslisted with:** LAW 639**Description:** Intestate succession and related matters, execution of wills, revocation of wills, problems created by the time gap in wills, limitations on the power to devise, construction of wills (mistake and ambiguity), "living wills", durable powers of attorney, health care directives, the elements of trust, formalities in the creation of a trust, the interest of the beneficiary, charitable trusts and problems of trust administration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 767, LAW 767G**LAW 640 International Law****Crosslisted with:** LAW 640G**Notes:** This course is available to online LL.M. students.**Description:** Delves in great depth into the relationship between international agreements and the US legal system as well as international law governing treaties. Examines specialty areas of international law as "case studies" including international investment law, international trade law, international family law, international space law, and international human rights law. Mock exercises involve international negotiations, litigation, and interagency meetings. Critically examines recent international law cases within the US Supreme Court and federal courts of appeal.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 665, LAW 665G

LAW 640G International Law**Crosslisted with:** LAW 640**Notes:** This course is available to online LL.M. students.

Description: Delves in great depth into the relationship between international agreements and the US legal system as well as international law governing treaties. Examines specialty areas of international law as "case studies" including international investment law, international trade law, international family law, international space law, and international human rights law. Mock exercises involve international negotiations, litigation, and interagency meetings. Critically examines recent international law cases within the US Supreme Court and federal courts of appeal.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 665, LAW 665G**LAW 641 Environmental Law****Crosslisted with:** LAW 641G

Description: Examines the theoretical and scientific underpinnings of environmental policy as well as specific federal laws designed to control water and air pollution or assign liability for toxic cleanups. Issues are viewed from several perspectives, including those of regulated businesses, environmental activists, and government agencies.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 641G Environmental Law****Crosslisted with:** LAW 641

Description: Examines the theoretical and scientific underpinnings of environmental policy as well as specific federal laws designed to control water and air pollution or assign liability for toxic cleanups. Issues are viewed from several perspectives, including those of regulated businesses, environmental activists, and government agencies.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 642 Conflict of Laws****Crosslisted with:** LAW 642G

Description: Legal and constitutional concepts involved in choosing the applicable law when the essential facts of a case are not confined to one state or national sovereignty.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 642G Conflict of Laws****Crosslisted with:** LAW 642

Description: Legal and constitutional concepts involved in choosing the applicable law when the essential facts of a case are not confined to one state or national sovereignty.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 643 Advanced Torts****Crosslisted with:** LAW 643G

Description: Selected topics in tort law. Advanced class in tort law, considering the general legal theory of tort, as well as specific topics not studied in detail during the required first-year torts class. May include tort claims other than the intentional torts, negligence, and products liability—i.e., defamation, nuisance, privacy, abuse of legal process, interference with advantageous relationships, tort claims implied from statutes, the prima facie tort, and others. May also include topics relating to the functioning of tort law in social context—e.g., the efficiency with which tort litigation accomplishes its apparent purpose, alternative legal mechanisms to reduce risk or promote safety, alternative systems of compensating for harms, legislative tort reform initiatives, and others.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SUMMER**LAW 643G Advanced Torts****Crosslisted with:** LAW 643

Description: Selected topics in tort law. Advanced class in tort law, considering the general legal theory of tort, as well as specific topics not studied in detail during the required first-year torts class. May include tort claims other than the intentional torts, negligence, and products liability—i.e., defamation, nuisance, privacy, abuse of legal process, interference with advantageous relationships, tort claims implied from statutes, the prima facie tort, and others. May also include topics relating to the functioning of tort law in social context—e.g., the efficiency with which tort litigation accomplishes its apparent purpose, alternative legal mechanisms to reduce risk or promote safety, alternative systems of compensating for harms, legislative tort reform initiatives, and others.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SUMMER

LAW 644 Secured Transactions**Crosslisted with:** LAW 644G

Description: Overview of the rights and obligations of an unsecured creditor under state law. Focuses on the rights and obligations of a secured creditor under Article 9 of the Uniform Commercial Code. Study the relationship between the debtor and the secured creditor and examine the requirements of the taking of a security interest in personal property and the rights of the secured creditor upon default by the debtor. Study of the filing system for perfection of a security interest and the priority rules for resolving conflicts between the secured creditor and a variety of other creditors, including the bankruptcy trustee.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 644G Secured Transactions****Crosslisted with:** LAW 644

Description: Overview of the rights and obligations of an unsecured creditor under state law. Focuses on the rights and obligations of a secured creditor under Article 9 of the Uniform Commercial Code. Study the relationship between the debtor and the secured creditor and examine the requirements of the taking of a security interest in personal property and the rights of the secured creditor upon default by the debtor. Study of the filing system for perfection of a security interest and the priority rules for resolving conflicts between the secured creditor and a variety of other creditors, including the bankruptcy trustee.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 645 Unfair Competition****Crosslisted with:** LAW 645G

Description: Study of the federal and state statutes and common law doctrines restricting unfair methods of competition in business. Topics include false advertising, trademark law, misappropriation, trade secret law and the right of publicity.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 645G Unfair Competition****Crosslisted with:** LAW 645

Description: Study of the federal and state statutes and common law doctrines restricting unfair methods of competition in business. Topics include false advertising, trademark law, misappropriation, trade secret law and the right of publicity.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 646 Evidence****Crosslisted with:** LAW 646G

Description: Covers the Federal Rules of Evidence and its application to the courtroom. Uses a problem-based approach and centers around two in-depth case files, which simulate the kind of cases that might appear in any lawyer's office.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** EDAD 961; LAW 761, LAW 761G**LAW 646G Evidence****Crosslisted with:** LAW 646

Description: Covers the Federal Rules of Evidence and its application to the courtroom. Uses a problem-based approach and centers around two in-depth case files, which simulate the kind of cases that might appear in any lawyer's office.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** EDAD 961; LAW 761, LAW 761G**LAW 647 Employment Law****Crosslisted with:** LAW 647G

Description: Analysis of the employment relationship as it has developed outside of the collective bargaining context. History and current status of the employment relationship, including discharge-of-will, occupational safety and health, minimum wage/maximum hour legislation, unemployment compensation and noncompetition agreements.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 585, LAW 585G**LAW 647G Employment Law****Crosslisted with:** LAW 647

Description: Analysis of the employment relationship as it has developed outside of the collective bargaining context. History and current status of the employment relationship, including discharge-of-will, occupational safety and health, minimum wage/maximum hour legislation, unemployment compensation and noncompetition agreements.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 585, LAW 585G

LAW 648 Business Planning**Crosslisted with:** LAW 648G

Description: Process of planning business transactions that take into account many relevant bodies of law as well as the needs of clients. Learn about the goals and methods of business planning, the role of ethics in providing legal advice, factors that influence the choice of business entity for a venture, legal rules applying to partnerships and limited liability companies ("LLCs"), relevant laws dealing with corporations and securities regulation, laws that pertain to corporate restructurings, and laws applying to the purchase, sale, or merger of corporate businesses.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 648G Business Planning****Crosslisted with:** LAW 648

Description: Process of planning business transactions that take into account many relevant bodies of law as well as the needs of clients. Learn about the goals and methods of business planning, the role of ethics in providing legal advice, factors that influence the choice of business entity for a venture, legal rules applying to partnerships and limited liability companies ("LLCs"), relevant laws dealing with corporations and securities regulation, laws that pertain to corporate restructurings, and laws applying to the purchase, sale, or merger of corporate businesses.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 649 First Amendment: Freedom of Speech & Press****Crosslisted with:** LAW 649G

Description: Freedom of Speech and of the Press in the age of the Foreign Intelligence Surveillance Act and reporters going to jail for refusing to reveal their sources. Topics include free speech, free press, fair trial, defamation, privacy, state secrets, indecency, obscenity, censorship, commercial speech, media access to trials, jails, and executions.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 649G First Amendment: Freedom of Speech & Press****Crosslisted with:** LAW 649

Description: Freedom of Speech and of the Press in the age of the Foreign Intelligence Surveillance Act and reporters going to jail for refusing to reveal their sources. Topics include free speech, free press, fair trial, defamation, privacy, state secrets, indecency, obscenity, censorship, commercial speech, media access to trials, jails, and executions.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 650 International Taxation****Crosslisted with:** LAW 650G**Prerequisites:** LAW 637/G

Description: Introduction to the U.S. federal income tax rules that apply to U.S. persons who live or do business abroad, or receive income from foreign sources, and to foreign persons who live or do business in the U.S., or receive income from U.S. sources. Includes a study of the role and effect of U.S. tax treaties. Introduction to the US federal income tax rules that apply to US persons (including corporations, partnerships and individuals) living or doing business abroad or receiving income from foreign sources, and to foreign persons living or doing business in the US or receiving income from US sources. Effect of US tax treaties on these rules.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 650G International Taxation****Crosslisted with:** LAW 650**Prerequisites:** LAW 637/G

Description: Introduction to the U.S. federal income tax rules that apply to U.S. persons who live or do business abroad, or receive income from foreign sources, and to foreign persons who live or do business in the U.S., or receive income from U.S. sources. Includes a study of the role and effect of U.S. tax treaties. Introduction to the US federal income tax rules that apply to US persons (including corporations, partnerships and individuals) living or doing business abroad or receiving income from foreign sources, and to foreign persons living or doing business in the US or receiving income from US sources. Effect of US tax treaties on these rules.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 651 Bioethics and Law Seminar****Crosslisted with:** LAW 651G**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 651G Bioethics and Law Seminar****Crosslisted with:** LAW 651**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 652 COMPARATIVE LAW SMNR****Crosslisted with:** LAW 652G

Description: Introduction to major families of legal systems outside the common law orbit. Emphasis is on Western European and Socialist (Marxist) legal systems; others treated less intensively.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 652G COMPARATIVE LAW SMNR**Crosslisted with:** LAW 652**Description:** Introduction to major families of legal systems outside the common law orbit. Emphasis is on Western European and Socialist (Marxist) legal systems; others treated less intensively.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 653 Refugee and Asylum Law and Practice****Crosslisted with:** LAW 653G**Description:** Examination of refugee issues in the context of domestic and international political environments. Topics will include asylum reform, gender-based persecution, persecution of lesbians and gays, deficiencies in international and domestic refugee law and firm resettlement of displaced persons. Study of the interplay among political, social, economic, cultural and psychological phenomena as refugees, governments of host countries and international and nongovernmental organizations interact in the context of ongoing crises around the world. Participate in simulations designed to teach practical skills necessary to an asylum and refugee law practice, including working with translators, interviewing and case advocacy. Asylum cases will serve as the foundation for role play exercises.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 653G Refugee and Asylum Law and Practice****Crosslisted with:** LAW 653**Description:** Examination of refugee issues in the context of domestic and international political environments. Topics will include asylum reform, gender-based persecution, persecution of lesbians and gays, deficiencies in international and domestic refugee law and firm resettlement of displaced persons. Study of the interplay among political, social, economic, cultural and psychological phenomena as refugees, governments of host countries and international and nongovernmental organizations interact in the context of ongoing crises around the world. Participate in simulations designed to teach practical skills necessary to an asylum and refugee law practice, including working with translators, interviewing and case advocacy. Asylum cases will serve as the foundation for role play exercises.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 654 Comparative Law: World Legal Systems and Their Relevance to U.S. Law and Practice****Crosslisted with:** LAW 654G**Description:** Study of the different legal systems of the world and how they relate to one another. Develop a general understanding of the major foreign legal systems and their impact on U.S. law, lawyers and clients. Substantive topics for comparative study may include torts, contracts, civil procedure, criminal procedure, and the protection of human rights. Investigate the potential for identifying general principles of law and ethics common to most legal systems. Acquire skills in thinking critically about comparative law and what light it can shed on the American legal system and possible reforms of it**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 654G Comparative Law: World Legal Systems and Their Relevance to U.S. Law and Practice****Crosslisted with:** LAW 654**Description:** Study of the different legal systems of the world and how they relate to one another. Develop a general understanding of the major foreign legal systems and their impact on U.S. law, lawyers and clients. Substantive topics for comparative study may include torts, contracts, civil procedure, criminal procedure, and the protection of human rights. Investigate the potential for identifying general principles of law and ethics common to most legal systems. Acquire skills in thinking critically about comparative law and what light it can shed on the American legal system and possible reforms of it**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 655 Sales and Leases****Crosslisted with:** LAW 655G**Description:** A study of the law governing the sale and lease of goods with primary emphasis on Article 2 and 2A of the Uniform Commercial Code. Among the topics included are: contract formation and modifications; acceptance and rejection of goods; warranties; risk of loss; and remedies for breach of contract, including breach of warranty remedies and some non-UCC remedies in consumer transactions. On selected issues, the Convention on the International Sale of Goods will be examined. Develop contract drafting skills. Enhance ability to read and analyze a statute.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 655G Sales and Leases**Crosslisted with:** LAW 655

Description: A study of the law governing the sale and lease of goods with primary emphasis on Article 2 and 2A of the Uniform Commercial Code. Among the topics included are: contract formation and modifications; acceptance and rejection of goods; warranties; risk of loss; and remedies for breach of contract, including breach of warranty remedies and some non-UCC remedies in consumer transactions. On selected issues, the Convention on the International Sale of Goods will be examined. Develop contract drafting skills. Enhance ability to read and analyze a statute.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 656 Regulation of Banks and the Fintech Industry****Crosslisted with:** LAW 656G

Description: Provides an overview of a number of basic banking issues. Examines the structure of the financial services industry, including the formation and expansion of banks and financial holding companies. Topical issues will include internet banking, lending (including a close look at a number of consumer fair lending laws (TILA, HELC, ECOA, HMDA and RESPA)), securitization of bank loans, securities and insurance (brokerage and underwriting) by banking institutions, international banking and other current issues in banking law. The focus is on federal regulation of banking, although there is an opportunity to compare the state regulation of banking during a conversation with local bankers and a Nebraska banking regulator.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 656G Regulation of Banks and the Fintech Industry****Crosslisted with:** LAW 656

Description: Provides an overview of a number of basic banking issues. Examines the structure of the financial services industry, including the formation and expansion of banks and financial holding companies. Topical issues will include internet banking, lending (including a close look at a number of consumer fair lending laws (TILA, HELC, ECOA, HMDA and RESPA)), securitization of bank loans, securities and insurance (brokerage and underwriting) by banking institutions, international banking and other current issues in banking law. The focus is on federal regulation of banking, although there is an opportunity to compare the state regulation of banking during a conversation with local bankers and a Nebraska banking regulator.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 657 Empirical Legal Studies****Crosslisted with:** LAW 657G

Description: Introduction to one of the fastest growing areas of legal scholarship and practice - the use of empirical techniques in research and litigation. Learning how to be sophisticated and critical consumers of empirical research that lawyers and experts often use to resolve legal cases and controversies, to shape legislation, and to use as argument in public policy debates. Introduction to survey research methodology, designing and conducting experiments, data gathering and analysis through descriptive and inferential statistics. In addition to discussing how to perform these techniques, students read cases and articles in which each of the techniques has played an important role. The course introduces law students to the social sciences through a "hands on" approach. Students will collect and analyze their own data by completing small research projects related to their areas of interest. Class sessions include discussion of social science and legal materials, lectures on the basics of empirical analysis, assistance with analyzing statistical data with computer packages, assistance with interpreting data, and student presentations. Students fulfill the course requirements through writing a paper, participating in class, presenting their research to the class, and completing several exercises. Students will learn to use computer statistical software packages (SPSS) for these exercises.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 657G Empirical Legal Studies****Crosslisted with:** LAW 657

Description: Introduction to one of the fastest growing areas of legal scholarship and practice - the use of empirical techniques in research and litigation. Learning how to be sophisticated and critical consumers of empirical research that lawyers and experts often use to resolve legal cases and controversies, to shape legislation, and to use as argument in public policy debates. Introduction to survey research methodology, designing and conducting experiments, data gathering and analysis through descriptive and inferential statistics. In addition to discussing how to perform these techniques, students read cases and articles in which each of the techniques has played an important role. The course introduces law students to the social sciences through a "hands on" approach. Students will collect and analyze their own data by completing small research projects related to their areas of interest. Class sessions include discussion of social science and legal materials, lectures on the basics of empirical analysis, assistance with analyzing statistical data with computer packages, assistance with interpreting data, and student presentations. Students fulfill the course requirements through writing a paper, participating in class, presenting their research to the class, and completing several exercises. Students will learn to use computer statistical software packages (SPSS) for these exercises.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 658 Clinical Practice-Entrepreneurship**Crosslisted with:** LAW 658G**Prerequisites:** Pre-requisite: Law 632/632G; Pre- or Co-requisite: 790/790G; Senior Standing; Participation in a concurrent seminar concentrating on the development of skills necessary to effectively advise entrepreneurial clients is required.**Notes:** Limited enrollment pursuant to a written application process that occurs in the prior semester.**Description:** Under close faculty supervision advise and represent startup business clients in a variety of early-stage legal matters, including entity formation, contract drafting and review, intellectual property protection, real estate, financing, regulatory, compliance and other transactional matters.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**LAW 658G Clinical Practice-Entrepreneurship****Crosslisted with:** LAW 658**Prerequisites:** Pre-requisite: Law 632/632G; Pre- or Co-requisite: 790/790G; Senior Standing; Participation in a concurrent seminar concentrating on the development of skills necessary to effectively advise entrepreneurial clients is required.**Notes:** Limited enrollment pursuant to a written application process that occurs in the prior semester.**Description:** Under close faculty supervision advise and represent startup business clients in a variety of early-stage legal matters, including entity formation, contract drafting and review, intellectual property protection, real estate, financing, regulatory, compliance and other transactional matters.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**LAW 660 Science and the Law****Crosslisted with:** LAW 660G**Description:** Analysis of the role of science in the law. This class will explore issues such as biotechnology, computers, scientific evidence, regulatory approval, antitrust, and environmental law to explore the intersection of science, technology, and the effect on the law and legal decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 660G Science and the Law****Crosslisted with:** LAW 660**Description:** Analysis of the role of science in the law. This class will explore issues such as biotechnology, computers, scientific evidence, regulatory approval, antitrust, and environmental law to explore the intersection of science, technology, and the effect on the law and legal decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 661 Aviation Law****Crosslisted with:** LAW 661G**Description:** Focus is on public international air law, with emphasis on the Chicago Convention of 1944 and the International Civil Aviation Organization, the exchange of air traffic rights by way of bilateral air service agreements, criminal air law treaties and selected areas of private international air law including air carrier liability under the Warsaw and Montreal Conventions, respectively the Rome Convention alternatively tort law. It will also include the role of the GATS and the EU in aviation law.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 661G Aviation Law****Crosslisted with:** LAW 661**Description:** Focus is on public international air law, with emphasis on the Chicago Convention of 1944 and the International Civil Aviation Organization, the exchange of air traffic rights by way of bilateral air service agreements, criminal air law treaties and selected areas of private international air law including air carrier liability under the Warsaw and Montreal Conventions, respectively the Rome Convention alternatively tort law. It will also include the role of the GATS and the EU in aviation law.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 662 International Intellectual Property Law****Crosslisted with:** LAW 662G**Description:** Overview of the United States laws of copyright, patent, trade secret and trademark for students of all backgrounds and discussions of the laws and mechanisms to protect intellectual property rights abroad including analysis of all major international treaties and conventions. Covers not only the legal and regulatory schemes but also the policy implications.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 662G International Intellectual Property Law****Crosslisted with:** LAW 662**Description:** Overview of the United States laws of copyright, patent, trade secret and trademark for students of all backgrounds and discussions of the laws and mechanisms to protect intellectual property rights abroad including analysis of all major international treaties and conventions. Covers not only the legal and regulatory schemes but also the policy implications.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL

LAW 663 Taxation-Individual Income II**Crosslisted with:** LAW 663G**Description:** Most important tax principles affecting business and investments, as well as an introduction to basic tax procedure (both administrative and judicial), civil and criminal fraud, tax research, and certain ethical issues common in tax practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 663G Taxation-Individual Income II****Crosslisted with:** LAW 663**Description:** Most important tax principles affecting business and investments, as well as an introduction to basic tax procedure (both administrative and judicial), civil and criminal fraud, tax research, and certain ethical issues common in tax practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 664 Gender, Race, and Class Issues in the Law****Crosslisted with:** LAW 664G**Notes:** Credit toward the degree may be earned in only one of: Gender Issues in the Law (LAW 771/771G) and (LAW 664/664G), but not both.**Description:** The role of gender, race, and class in shaping socio-legal relationships and policies. Selected procedural substantive areas of the law that affect and are affected by gender, race, and class. Employment, property, torts, constitutional law and contractual relationships, and the complex relationship between gender, race, class, and the law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 664G Gender, Race, and Class Issues in the Law****Crosslisted with:** LAW 664**Notes:** Credit toward the degree may be earned in only one of: Gender Issues in the Law (LAW 771/771G) and (LAW 664/664G), but not both.**Description:** The role of gender, race, and class in shaping socio-legal relationships and policies. Selected procedural substantive areas of the law that affect and are affected by gender, race, and class. Employment, property, torts, constitutional law and contractual relationships, and the complex relationship between gender, race, class, and the law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 665 International Trade Law and Policy Seminar****Crosslisted with:** LAW 665G**Prerequisites:** LAW 671/G preferred; or LAW 640/G**Description:** Selected issues of international trade law and policy. Several prominent issues of international trade law and policy, including trade in agricultural goods, new issues facing the international trading system, and other topics selected by students for research papers. Visiting scholars, government officials, or faculty from other departments at the university may make presentations to the seminar.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 665G International Trade Law and Policy Seminar****Crosslisted with:** LAW 665**Prerequisites:** LAW 671/G preferred; or LAW 640/G**Description:** Selected issues of international trade law and policy. Several prominent issues of international trade law and policy, including trade in agricultural goods, new issues facing the international trading system, and other topics selected by students for research papers. Visiting scholars, government officials, or faculty from other departments at the university may make presentations to the seminar.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 666 International Environmental Law****Crosslisted with:** LAW 666G**Description:** Analysis of the legal rules and institutions used to address international environmental issues. Includes the sources and nature of international environmental law, extraterritorial application of domestic environmental law, transboundary pollution, sustainable development, protection of the global environment, and the impacts of international trade policy and international development policy on the environment.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 666G International Environmental Law****Crosslisted with:** LAW 666**Description:** Analysis of the legal rules and institutions used to address international environmental issues. Includes the sources and nature of international environmental law, extraterritorial application of domestic environmental law, transboundary pollution, sustainable development, protection of the global environment, and the impacts of international trade policy and international development policy on the environment.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

LAW 667 Construction Law**Crosslisted with:** LAW 667G

Description: General concepts and legal principles relating to construction contracts, including some basic foundation principles such as communication, risk allocation, problem solving, loss and profit sharing, mutual objectives, and dispute resolution. Taught against backdrop of construction law, includes study of legal and equitable issues resulting from the construction relationship and disputes relating to that relationship. May be applicable for employment contracts, interfirm agreements, supply-chain relationships, informal credit contracts, and other settings where contracting is focused on the continued relationship between the parties as opposed to a discrete transaction.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 667G Construction Law****Crosslisted with:** LAW 667

Description: General concepts and legal principles relating to construction contracts, including some basic foundation principles such as communication, risk allocation, problem solving, loss and profit sharing, mutual objectives, and dispute resolution. Taught against backdrop of construction law, includes study of legal and equitable issues resulting from the construction relationship and disputes relating to that relationship. May be applicable for employment contracts, interfirm agreements, supply-chain relationships, informal credit contracts, and other settings where contracting is focused on the continued relationship between the parties as opposed to a discrete transaction.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 668 Principles of Regulation****Crosslisted with:** LAW 668G

Description: Examination of the principles of regulation and about whether and how regulatory intervention is beneficial to society; the myriad of tensions and contradictions often inherent in regulation; provide critical analytical tools needed in today's legal, political, and business environment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 668G Principles of Regulation****Crosslisted with:** LAW 668

Description: Examination of the principles of regulation and about whether and how regulatory intervention is beneficial to society; the myriad of tensions and contradictions often inherent in regulation; provide critical analytical tools needed in today's legal, political, and business environment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 669 Research in a Selected Field I****Crosslisted with:** LAW 669G

Notes: Before registering for this course, a student must (1) obtain the approval of the faculty member involved and (2) submit the Research in a Selected Field form to the College of Law registrar. Absent the prior approval of the dean, no student may take more than 6 hours of Research in a Selected Field and/or Psycholegal Research.

Description: Individual study under the supervision of a faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**Offered:** ALL**LAW 669G Research in a Selected Field I****Crosslisted with:** LAW 669

Notes: Before registering for this course, a student must (1) obtain the approval of the faculty member involved and (2) submit the Research in a Selected Field form to the College of Law registrar. Absent the prior approval of the dean, no student may take more than 6 hours of Research in a Selected Field and/or Psycholegal Research.

Description: Individual study under the supervision of a faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**Offered:** ALL**LAW 670 Research in a Selected Field II****Crosslisted with:** LAW 670G

Notes: Before registering for this course, a student must (1) obtain the approval of the faculty member involved and (2) submit the Research in a Selected Field form to the College of Law registrar. Absent the prior approval of the dean, no student may take more than 6 hours of Research in a Selected Field and/or Psycholegal Research.

Description: Individual study under the supervision of a faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**Offered:** ALL**LAW 670G Research in a Selected Field II****Crosslisted with:** LAW 670

Notes: Before registering for this course, a student must (1) obtain the approval of the faculty member involved and (2) submit the Research in a Selected Field form to the College of Law registrar. Absent the prior approval of the dean, no student may take more than 6 hours of Research in a Selected Field and/or Psycholegal Research.

Description: Individual study under the supervision of a faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**Offered:** ALL

LAW 671 International Trade Law**Crosslisted with:** LAW 671G

Description: Explores government regulation of international trade and the interaction between national and international rules governing trade. Specific topics covered include U.S. constitutional issues regarding the regulation of trade by the U.S. federal and state governments, regulations regarding the importation of goods into the United States (e.g. classifying, valuing and determining the origin of imported goods), barriers to U.S. exports, rules of the GATT and NAFTA that seek to eliminate or limit such barriers, U.S. unfair trade laws (i.e. laws designed to protect U.S. businesses from imports that have an "unfair" advantage) and the institutional and dispute settlement rules of the newly created World Trade Organization (WTO). A visitor from the Washington, D.C., trade policy community may be invited to speak. Past speakers include: U.S. Senator Chuck Hagel, Governor Ben Nelson, Congressional Representative Doug Bereuter and the Honorable Abner Mikva. Students who have taken LAW 668G may not enroll in this course.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** LAW 665, LAW 665G**LAW 671G International Trade Law****Crosslisted with:** LAW 671

Description: Explores government regulation of international trade and the interaction between national and international rules governing trade. Specific topics covered include U.S. constitutional issues regarding the regulation of trade by the U.S. federal and state governments, regulations regarding the importation of goods into the United States (e.g. classifying, valuing and determining the origin of imported goods), barriers to U.S. exports, rules of the GATT and NAFTA that seek to eliminate or limit such barriers, U.S. unfair trade laws (i.e. laws designed to protect U.S. businesses from imports that have an "unfair" advantage) and the institutional and dispute settlement rules of the newly created World Trade Organization (WTO). A visitor from the Washington, D.C., trade policy community may be invited to speak. Past speakers include: U.S. Senator Chuck Hagel, Governor Ben Nelson, Congressional Representative Doug Bereuter and the Honorable Abner Mikva. Students who have taken LAW 668G may not enroll in this course.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** LAW 665, LAW 665G**LAW 672 JURISPRUDENCE****Crosslisted with:** LAW 672G

Description: Examines central jurisprudential questions that arise in the criminal law. The following topics will be considered: (1) the purpose and justification of punishment, especially the legitimate role, if any, for retribution and the expressive function of punishment; (2) the relationship between retribution and revenge; (3) the justification of capital punishment; (4) the relationship among the state, defendants, and victims in the criminal process, including the proper role, if any, of victim impact statements.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 672G JURISPRUDENCE****Crosslisted with:** LAW 672

Description: Examines central jurisprudential questions that arise in the criminal law. The following topics will be considered: (1) the purpose and justification of punishment, especially the legitimate role, if any, for retribution and the expressive function of punishment; (2) the relationship between retribution and revenge; (3) the justification of capital punishment; (4) the relationship among the state, defendants, and victims in the criminal process, including the proper role, if any, of victim impact statements.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 673 International Business Transactions****Crosslisted with:** LAW 673G

Notes: Available to online LLM students. Students who have taken LAW 668G may not enroll in this course.

Description: Covers both private and public (government regulation) aspects of international business transactions. Specific topics covered include international sales contracts and the Convention on the International Sale of Goods (CISG), regulation of foreign investment and Bilateral Investment Treaties, (BITs), private international dispute resolution (including choice of forum and choice of law clauses, international commercial arbitration, and enforcement of foreign arbitral awards), US customs law, responses to fairly and unfairly traded imports, and international bribery and the Foreign Corrupt Practices Act (FCPA).

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 673G International Business Transactions****Crosslisted with:** LAW 673

Notes: Available to online LLM students. Students who have taken LAW 668G may not enroll in this course.

Description: Covers both private and public (government regulation) aspects of international business transactions. Specific topics covered include international sales contracts and the Convention on the International Sale of Goods (CISG), regulation of foreign investment and Bilateral Investment Treaties, (BITs), private international dispute resolution (including choice of forum and choice of law clauses, international commercial arbitration, and enforcement of foreign arbitral awards), US customs law, responses to fairly and unfairly traded imports, and international bribery and the Foreign Corrupt Practices Act (FCPA).

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL

LAW 674 Juvenile Law**Crosslisted with:** LAW 674G**Description:** Investigation of the relationship between children, the family, and the state. Both public and private law considerations with emphasis on the juvenile justice system and general considerations of children's constitutional rights.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 674G Juvenile Law****Crosslisted with:** LAW 674**Description:** Investigation of the relationship between children, the family, and the state. Both public and private law considerations with emphasis on the juvenile justice system and general considerations of children's constitutional rights.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 675 Animals & Agricultural Production - Law & Policy****Crosslisted with:** LAW 675G**Description:** Examines those areas of law that impact animal agriculture. Includes coverage of those legal regimes that implement governmental policy concerning animal welfare, animal-based medical research, food safety, consumer information, international trade, and environmental impacts. Also examines the underlying scientific foundation for these policy concerns.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SUMMER**LAW 675G Animals & Agricultural Production - Law & Policy****Crosslisted with:** LAW 675**Description:** Examines those areas of law that impact animal agriculture. Includes coverage of those legal regimes that implement governmental policy concerning animal welfare, animal-based medical research, food safety, consumer information, international trade, and environmental impacts. Also examines the underlying scientific foundation for these policy concerns.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SUMMER**LAW 676 Space & Satellite Business Law****Crosslisted with:** LAW 676G**Notes:** Students will engage in a simulation of a condensed commercial space business transaction ζ from business plan to launch. This course is available to online LLM students.**Description:** Review and examination of the history of Presidential space policies regarding space commercialization. Exploration of the work of all key federal agencies charged with licensing and regulating the commercial space transportation and satellite industries and the statutes that give these agencies this authority and the rules that the agencies administer and enforce. Students will engage in a simulation of a condensed commercial space business transaction - from business plan to launch.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 676G Space & Satellite Business Law****Crosslisted with:** LAW 676**Notes:** Students will engage in a simulation of a condensed commercial space business transaction ζ from business plan to launch. This course is available to online LLM students.**Description:** Review and examination of the history of Presidential space policies regarding space commercialization. Exploration of the work of all key federal agencies charged with licensing and regulating the commercial space transportation and satellite industries and the statutes that give these agencies this authority and the rules that the agencies administer and enforce. Students will engage in a simulation of a condensed commercial space business transaction - from business plan to launch.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 677 Representing the Spanish-Speaking Client****Crosslisted with:** LAW 677G**Notes:** Basic Spanish language, writing and conversation skills required.**Description:** Be introduced to Spanish-speaking attorneys in many practice areas and community members that work with Spanish-speaking attorneys and their clients. Discuss the needs of Spanish-speaking clients when dealing with county attorneys, public defenders, private practice criminal defense, private practice immigration, private practice injury cases, non-profit legal services, court interpreters and consulate representatives of foreign governments.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 4**Format:** LEC**Offered:** FALL

LAW 677G Representing the Spanish-Speaking Client**Crosslisted with:** LAW 677**Notes:** Basic Spanish language, writing and conversation skills required.**Description:** Be introduced to Spanish-speaking attorneys in many practice areas and community members that work with Spanish-speaking attorneys and their clients. Discuss the needs of Spanish-speaking clients when dealing with county attorneys, public defenders, private practice criminal defense, private practice immigration, private practice injury cases, non-profit legal services, court interpreters and consulate representatives of foreign governments.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 678 Banking Law Seminar****Crosslisted with:** LAW 678G**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 678G Banking Law Seminar****Crosslisted with:** LAW 678**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 679 Food Law and Policy: Regulation of Safety and Marketing****Crosslisted with:** LAW 679G**Description:** Examination of federal laws and regulations that govern food safety and food labeling shared by federal agencies, including the Food and Drug Administration, U.S. Department of Agriculture, U.S. Department of Commerce, and U.S. Environmental Protection Agency. History of federal food safety laws and enforcement, discussion of case studies highlighting current issues in the news, e.g., salmonella contamination of eggs, tort liability for "defective" foods, regulation of biotechnology use in foods, and the science underlying food safety regulation and food production. Conclusion with analysis of the policy goals and implementation of the FDA Food Safety Modernization Act signed into law by President Obama, January 4, 2011, which provides for a new system of federal oversight of domestically produced and imported foods.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 679G Food Law and Policy: Regulation of Safety and Marketing****Crosslisted with:** LAW 679**Description:** Examination of federal laws and regulations that govern food safety and food labeling shared by federal agencies, including the Food and Drug Administration, U.S. Department of Agriculture, U.S. Department of Commerce, and U.S. Environmental Protection Agency. History of federal food safety laws and enforcement, discussion of case studies highlighting current issues in the news, e.g., salmonella contamination of eggs, tort liability for "defective" foods, regulation of biotechnology use in foods, and the science underlying food safety regulation and food production. Conclusion with analysis of the policy goals and implementation of the FDA Food Safety Modernization Act signed into law by President Obama, January 4, 2011, which provides for a new system of federal oversight of domestically produced and imported foods.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 680 Employment Discrimination Law****Crosslisted with:** LAW 680G**Description:** The inequalities in American society which arise from employment discrimination against minorities and other under-represented groups, how these inequalities are reinforced and at times created by laws, and how law can be used to remedy many of these inequalities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 585, LAW 585G**LAW 680G Employment Discrimination Law****Crosslisted with:** LAW 680**Description:** The inequalities in American society which arise from employment discrimination against minorities and other under-represented groups, how these inequalities are reinforced and at times created by laws, and how law can be used to remedy many of these inequalities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 585, LAW 585G

LAW 681 Cyberlaw**Crosslisted with:** LAW 681G**Notes:** Available to online LLM students.

Description: Explores a range of legal issues in cyber domain, including cyber security, cyber-bullying and online harassment, privacy, network ownership and access, private versus public regulation of cyberspace, speech in cyberspace, content as property and intellectual property in cyberspace, jurisdiction over cyberspace activities, liability of intermediaries, state and local regulation of cyberspace, and the interrelationship between technology and law as mechanisms of regulation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 681G Cyberlaw****Crosslisted with:** LAW 681**Notes:** Available to online LLM students.

Description: Explores a range of legal issues in cyber domain, including cyber security, cyber-bullying and online harassment, privacy, network ownership and access, private versus public regulation of cyberspace, speech in cyberspace, content as property and intellectual property in cyberspace, jurisdiction over cyberspace activities, liability of intermediaries, state and local regulation of cyberspace, and the interrelationship between technology and law as mechanisms of regulation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 683 Patents and International Intellectual Property****Crosslisted with:** LAW 683G

Description: Two separate components; one involving patent law and one involving international intellectual property. The patent law component looks at some of the central issues of the protection and enforcement of patents with emphasis on the policy issues that arise from patent protection. Focus of the international intellectual property component is on private law. Materials emphasize issues that an American lawyer representing an American company should understand. Relative emphasis between patents and international intellectual property determined each term.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**LAW 683G Patents and International Intellectual Property****Crosslisted with:** LAW 683

Description: Two separate components; one involving patent law and one involving international intellectual property. The patent law component looks at some of the central issues of the protection and enforcement of patents with emphasis on the policy issues that arise from patent protection. Focus of the international intellectual property component is on private law. Materials emphasize issues that an American lawyer representing an American company should understand. Relative emphasis between patents and international intellectual property determined each term.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**LAW 684 Bioethics and Law****Crosslisted with:** LAW 684G

Description: Role of law in controlling, shaping, and responding to scientific and technological developments in the field of medicine and the biological sciences. May include contraception, abortion, sterilization, artificial conception, genetic engineering, the right to refuse treatment, euthanasia, the right to treatment of defective newborns, organ transplantation, and experimentation with human subjects.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 684G Bioethics and Law****Crosslisted with:** LAW 684

Description: Role of law in controlling, shaping, and responding to scientific and technological developments in the field of medicine and the biological sciences. May include contraception, abortion, sterilization, artificial conception, genetic engineering, the right to refuse treatment, euthanasia, the right to treatment of defective newborns, organ transplantation, and experimentation with human subjects.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL

LAW 685 Capital Punishment**Crosslisted with:** LAW 685G

Notes: Differs significantly from LAW 672G. LAW 672G directs primary attention to jurisprudential arguments regarding the justification of capital punishment in principle and in practice, with only secondary attention to a few of the central court cases. This course directs primary attention to the court cases and legal doctrine and policy issues arising out of those court cases. Thus, the two courses are complimentary with relatively little overlap, and neither presupposes the other. Those who wish to enroll in both courses are free to do so.

Description: Examines legal doctrine and policy regarding capital punishment in the United States. Draws heavily but not exclusively on decisions by the US Supreme Court. Topics addressed include: various Constitutional challenges and limitations according to Supreme Court decisions; aggravating and mitigating circumstances; jury selection and qualification; discriminatory application; the use of clinical testimony; and the role of counsel.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 685G Capital Punishment****Crosslisted with:** LAW 685

Notes: Differs significantly from LAW 672G. LAW 672G directs primary attention to jurisprudential arguments regarding the justification of capital punishment in principle and in practice, with only secondary attention to a few of the central court cases. This course directs primary attention to the court cases and legal doctrine and policy issues arising out of those court cases. Thus, the two courses are complimentary with relatively little overlap, and neither presupposes the other. Those who wish to enroll in both courses are free to do so.

Description: Examines legal doctrine and policy regarding capital punishment in the United States. Draws heavily but not exclusively on decisions by the US Supreme Court. Topics addressed include: various Constitutional challenges and limitations according to Supreme Court decisions; aggravating and mitigating circumstances; jury selection and qualification; discriminatory application; the use of clinical testimony; and the role of counsel.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 686 Gender Issues in the Law****Crosslisted with:** LAW 686G**Prerequisites:** LAW 630/G

Description: Critical review of the role of gender in shaping socio-legal relationships and policies. Examines selected procedural and substantive areas of the law that affect and are affected by gender. Includes, but are not limited to, employment, property, torts, the Constitution and contractual relationships. Emphasis on the complex relationship between gender, race and class.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 686G Gender Issues in the Law****Crosslisted with:** LAW 686**Prerequisites:** LAW 630/G

Description: Critical review of the role of gender in shaping socio-legal relationships and policies. Examines selected procedural and substantive areas of the law that affect and are affected by gender. Includes, but are not limited to, employment, property, torts, the Constitution and contractual relationships. Emphasis on the complex relationship between gender, race and class.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 687 Public Health Law****Crosslisted with:** LAW 687G**Prerequisites:** LAW 632G.

Description: Study of public health as an independent field, with emphasis on the law's involvement in implementing public health initiatives, and in setting limits on them.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL/SPR**LAW 687G Public Health Law****Crosslisted with:** LAW 687**Prerequisites:** LAW 632G.

Description: Study of public health as an independent field, with emphasis on the law's involvement in implementing public health initiatives, and in setting limits on them.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL/SPR

LAW 689 Workers' Compensation Law**Crosslisted with:** LAW 689G**Notes:** This course is closed to first year students.

Description: Supplement students' understanding of tort principles and to acquire a better understanding of how work-place injuries and occupational diseases are handled within the legal system, with particular emphasis on Nebraska law, practice, and procedure. For graduates that might enter into a litigation practice, and for graduates who undertake to provide advice to business clients about insurance coverage and employment law. Obtain a better understanding of the interrelationships between tort law situations and work-place injuries/ occupational diseases, including the interplay paid by private health insurers or government insurers such as Medicare, Medicaid, and the Veterans Administration. A brief overview of other work-place injury systems such as the Federal Employees' Compensation Act (FECA) and the Longshore and Harbor Workers' Compensation Act will be provided. Some practical application related to Nebraska workers' compensation law and suggested pleadings, trial, and settlement practice will be presented.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 689G Workers' Compensation Law****Crosslisted with:** LAW 689**Notes:** This course is closed to first year students.

Description: Supplement students' understanding of tort principles and to acquire a better understanding of how work-place injuries and occupational diseases are handled within the legal system, with particular emphasis on Nebraska law, practice, and procedure. For graduates that might enter into a litigation practice, and for graduates who undertake to provide advice to business clients about insurance coverage and employment law. Obtain a better understanding of the interrelationships between tort law situations and work-place injuries/ occupational diseases, including the interplay paid by private health insurers or government insurers such as Medicare, Medicaid, and the Veterans Administration. A brief overview of other work-place injury systems such as the Federal Employees' Compensation Act (FECA) and the Longshore and Harbor Workers' Compensation Act will be provided. Some practical application related to Nebraska workers' compensation law and suggested pleadings, trial, and settlement practice will be presented.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 690 Real Estate Transactions****Crosslisted with:** LAW 690G

Description: Examination of the typical provisions found in the legal documents that govern the transfer and financing of real estate and related legal issues with an emphasis on transactional drafting. Covers listing agreements, real estate sales contracts, deeds and deed covenants, title examination and title insurance, mortgage substitutes such as installment sale contracts, and mortgage agreements and deeds of trust. Concludes with an examination of the foreclosure process and alternatives to foreclosure. As part of a realistic real estate transaction simulation exercise represent either the buyer or the seller and negotiate and draft a real estate sales contract and related transactional document.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 690G Real Estate Transactions****Crosslisted with:** LAW 690

Description: Examination of the typical provisions found in the legal documents that govern the transfer and financing of real estate and related legal issues with an emphasis on transactional drafting. Covers listing agreements, real estate sales contracts, deeds and deed covenants, title examination and title insurance, mortgage substitutes such as installment sale contracts, and mortgage agreements and deeds of trust. Concludes with an examination of the foreclosure process and alternatives to foreclosure. As part of a realistic real estate transaction simulation exercise represent either the buyer or the seller and negotiate and draft a real estate sales contract and related transactional document.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 691 Advanced Torts Seminar****Crosslisted with:** LAW 691G

Description: An advanced class in tort law, considering the general legal theory of tort, as well as specific topics not studied in detail during the required first-year torts class. Tort claims other than the intentional torts, negligence, and products liability: Defamation, nuisance, privacy, abuse of legal process, interference with advantageous relationships, tort claims implied from statutes, the prima facie tort, and others. Topics relating to the functioning of tort law in social context: The efficiency with which tort litigation accomplishes its apparent purposes, alternative legal mechanisms to reduce risk or promote safety, alternative systems of compensating for harms, legislative tort reform initiatives, and others.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 691G Advanced Torts Seminar**Crosslisted with:** LAW 691

Description: An advanced class in tort law, considering the general legal theory of tort, as well as specific topics not studied in detail during the required first-year torts class. Tort claims other than the intentional torts, negligence, and products liability: Defamation, nuisance, privacy, abuse of legal process, interference with advantageous relationships, tort claims implied from statutes, the prima facie tort, and others. Topics relating to the functioning of tort law in social context: The efficiency with which tort litigation accomplishes its apparent purposes, alternative legal mechanisms to reduce risk or promote safety, alternative systems of compensating for harms, legislative tort reform initiatives, and others.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 692 State and Local Taxation****Crosslisted with:** LAW 692G

Description: Covers how state and local governments raise revenues and how the U.S. Constitution limits their choices. Look at how the evolution of interstate commerce (and specifically electronic commerce) has impacted state and local governments and how those governments are seeking new ways to finance themselves as well as the structure of state income, sales, and property taxes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 692G State and Local Taxation****Crosslisted with:** LAW 692

Description: Covers how state and local governments raise revenues and how the U.S. Constitution limits their choices. Look at how the evolution of interstate commerce (and specifically electronic commerce) has impacted state and local governments and how those governments are seeking new ways to finance themselves as well as the structure of state income, sales, and property taxes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 693 Law and Economics****Crosslisted with:** LAW 693G

Description: Introduction to economic tools and their application to the law. Overview of the principles of microeconomics and their application to various areas of private law (e.g., torts, contracts, property) and public law (e.g., environmental, constitutional, and criminal law & procedure).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 693G Law and Economics****Crosslisted with:** LAW 693

Description: Introduction to economic tools and their application to the law. Overview of the principles of microeconomics and their application to various areas of private law (e.g., torts, contracts, property) and public law (e.g., environmental, constitutional, and criminal law & procedure).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 694 Sports Law****Crosslisted with:** LAW 694G

Description: Selected legal issues affecting amateur and professional sports. Topics may include applicability of antitrust, communications, contract, labor, employment, trademark and tax laws to amateur and professional sports; the Division I NCAA governance structure; the relationship between the NCAA and international competition conducted under the auspices of the USOC and national sports governing boards; the ethical and professional aspects of player representation; the extra-governmental regulation of amateur athletics; and negotiations for media sports coverage.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 694G Sports Law****Crosslisted with:** LAW 694

Description: Selected legal issues affecting amateur and professional sports. Topics may include applicability of antitrust, communications, contract, labor, employment, trademark and tax laws to amateur and professional sports; the Division I NCAA governance structure; the relationship between the NCAA and international competition conducted under the auspices of the USOC and national sports governing boards; the ethical and professional aspects of player representation; the extra-governmental regulation of amateur athletics; and negotiations for media sports coverage.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 695 Clinical-Children's Justice****Crosslisted with:** LAW 695G

Notes: Two semester course: students receive 4 credit hours each semester (fall & spring only).

Description: Clinic in which third year law students, under the direct supervision of clinic director, serve as guardian ad litem (GAL) for children involved in child welfare system. Goals: provide students with knowledge, skills and ethical underpinnings necessary to function as effective advocates in a setting involving the legal needs of young children; allow student to obtain certification as approved GALs in the Nebraska court system, making them "practice ready" upon graduation.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 8**Format:** CLN**Offered:** FALL/SPR

LAW 695G Clinical-Children's Justice**Crosslisted with:** LAW 695**Notes:** Two semester course: students receive 4 credit hours each semester (fall & spring only).**Description:** Clinic in which third year law students, under the direct supervision of clinic director, serve as guardian ad litem (GAL) for children involved in child welfare system. Goals: provide students with knowledge, skills and ethical underpinnings necessary to function as effective advocates in a setting involving the legal needs of young children; allow student to obtain certification as approved GALs in the Nebraska court system, making them "practice ready" upon graduation.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 8**Format:** CLN**Offered:** FALL/SPR**LAW 696 Client Interviewing and Counseling****Crosslisted with:** LAW 696G**Description:** Introduction to the basics of legal interviewing (lawyer interaction with a client for the purpose of identifying the client's problem and gathering information on which the solution to that problem can be based) and counseling (a process in which lawyers help clients reach decisions). Course work includes class discussion, reading materials, demonstrations, and role play exercises and interviews.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 696G Client Interviewing and Counseling****Crosslisted with:** LAW 696**Description:** Introduction to the basics of legal interviewing (lawyer interaction with a client for the purpose of identifying the client's problem and gathering information on which the solution to that problem can be based) and counseling (a process in which lawyers help clients reach decisions). Course work includes class discussion, reading materials, demonstrations, and role play exercises and interviews.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 697 Patent Law****Crosslisted with:** LAW 697G**Description:** Introduction to the basic principles of the law of patents in the United States including the history, utility and function of the patent system; statutory and procedural requirements for patentability; recent case law; and patent enforcement mechanisms, remedies and defenses. Foundation in patent law for general legal practice that crosscuts all potential business client interests from individual inventors to small and large companies.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 697G Patent Law****Crosslisted with:** LAW 697**Description:** Introduction to the basic principles of the law of patents in the United States including the history, utility and function of the patent system; statutory and procedural requirements for patentability; recent case law; and patent enforcement mechanisms, remedies and defenses. Foundation in patent law for general legal practice that crosscuts all potential business client interests from individual inventors to small and large companies.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 698 Natural Resources Law****Crosslisted with:** LAW 698G**Description:** Addresses the conservation and use of public lands (including National Parks, Forests and other federal and state lands), wildlife, cultural and historic properties, and mineral resources. Focused primarily on federal law and its implications for state, tribal and private interests, as played out in the federal courts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 698G Natural Resources Law****Crosslisted with:** LAW 698**Description:** Addresses the conservation and use of public lands (including National Parks, Forests and other federal and state lands), wildlife, cultural and historic properties, and mineral resources. Focused primarily on federal law and its implications for state, tribal and private interests, as played out in the federal courts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 699 Land Use Planning****Crosslisted with:** LAW 699G**Description:** Legal and administrative aspects of the regulation of land use and development, the problems and techniques of urban planning at the various levels of government, and the relationship of private owners and builders to the government policies involved in shaping the physical environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 699G Land Use Planning**Crosslisted with:** LAW 699**Description:** Legal and administrative aspects of the regulation of land use and development, the problems and techniques of urban planning at the various levels of government, and the relationship of private owners and builders to the government policies involved in shaping the physical environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 701 Health Care Finance Seminar****Crosslisted with:** LAW 701G**Description:** Analysis of specific issues in the design and control of market and governmental mechanisms for the diversification of risk.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 701G Health Care Finance Seminar****Crosslisted with:** LAW 701**Description:** Analysis of specific issues in the design and control of market and governmental mechanisms for the diversification of risk.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 702 Introduction to the U.S. Legal System and Constitutional Principles for LL.M. Students****Crosslisted with:** LAW 702G**Description:** Introduction of international students to the foundations of the United States legal system, including the federal system; the separation of powers; the functions of the three branches; and the role of the common law. An overview of legal education in the United States, and an introduction to legal research and writing and case analysis.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 702G Introduction to the U.S. Legal System and Constitutional Principles for LL.M. Students****Crosslisted with:** LAW 702**Description:** Introduction of international students to the foundations of the United States legal system, including the federal system; the separation of powers; the functions of the three branches; and the role of the common law. An overview of legal education in the United States, and an introduction to legal research and writing and case analysis.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 703 Law and Medicine****Crosslisted with:** LAW 703G**Description:** Survey of major topics at the intersection of law and medicine in America today. Topics will relate to the legal implications of health-care quality and cost, to the legal implications of access to health care, or to issues in the areas of bioethics. Particular focus on the rights of access to health care; to the financing of health care; to the legal implications of the quality of health care; to the laws relating to medical personnel and institutions; to the individual rights of patients; and to the medicolegal issues surrounding morally controversial developments in medicine and the life sciences, such as organ transplantation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 703G Law and Medicine****Crosslisted with:** LAW 703**Description:** Survey of major topics at the intersection of law and medicine in America today. Topics will relate to the legal implications of health-care quality and cost, to the legal implications of access to health care, or to issues in the areas of bioethics. Particular focus on the rights of access to health care; to the financing of health care; to the legal implications of the quality of health care; to the laws relating to medical personnel and institutions; to the individual rights of patients; and to the medicolegal issues surrounding morally controversial developments in medicine and the life sciences, such as organ transplantation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 704 Agricultural Law****Crosslisted with:** LAW 704G**Description:** Legal problems and issues of unique importance to lawyers serving the agricultural sector. Representative topics include economic and environmental regulation of agriculture; organizing the farm business; financing agricultural production; marketing agricultural products; and managing agricultural risk.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 704G Agricultural Law****Crosslisted with:** LAW 704**Description:** Legal problems and issues of unique importance to lawyers serving the agricultural sector. Representative topics include economic and environmental regulation of agriculture; organizing the farm business; financing agricultural production; marketing agricultural products; and managing agricultural risk.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 705 AGRIC LAW SEMINAR**Crosslisted with:** LAW 705G**Description:** Selected problems in agricultural law.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 705G AGRIC LAW SEMINAR****Crosslisted with:** LAW 705**Description:** Selected problems in agricultural law.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 706 Rural Development and Energy Law****Crosslisted with:** LAW 706G**Description:** This course will cover specific laws and regulations, as well as business and policy considerations, that inform efforts to develop rural infrastructure, stimulate jobs, establish community-based financial and non-profit institutions, and encourage rural entrepreneurship. Particular emphasis will be placed on how energy law and policy may be shaping the rural future. This course will also include a comparative element, with literature from the Law and Development movement, international development, and the affordable housing and urban renewal contexts considered in conjunction with current rural development concerns.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 706G Rural Development and Energy Law****Crosslisted with:** LAW 706**Description:** This course will cover specific laws and regulations, as well as business and policy considerations, that inform efforts to develop rural infrastructure, stimulate jobs, establish community-based financial and non-profit institutions, and encourage rural entrepreneurship. Particular emphasis will be placed on how energy law and policy may be shaping the rural future. This course will also include a comparative element, with literature from the Law and Development movement, international development, and the affordable housing and urban renewal contexts considered in conjunction with current rural development concerns.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 707 International Human Rights Law Seminar****Crosslisted with:** LAW 707G**Description:** Examines the historical, political and philosophical roots of international human rights law, its development over the course of the last century and its contemporary role in international affairs. Specific topics may include the relevance of international human rights law for a practicing U.S. lawyer; the effect of the United States' recent signature and ratification of U.N. human rights conventions; the U.S.'s interaction with international human rights bodies, such as the U.N. Human Rights Committee; customary international human rights law; the rights of women; economic and social rights; religion and human rights; the prohibition of torture and its relationship to efforts to combat terrorism; contemporary measures to enforce international human rights law through the criminal process; the activities of regional human rights systems and their organs, such as the European Court of Human Rights; and the debate on whether there is a global "responsibility to protect" victims of genocide, war crimes, and crimes against humanity, including through the use of military intervention.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 707G International Human Rights Law Seminar****Crosslisted with:** LAW 707**Description:** Examines the historical, political and philosophical roots of international human rights law, its development over the course of the last century and its contemporary role in international affairs. Specific topics may include the relevance of international human rights law for a practicing U.S. lawyer; the effect of the United States' recent signature and ratification of U.N. human rights conventions; the U.S.'s interaction with international human rights bodies, such as the U.N. Human Rights Committee; customary international human rights law; the rights of women; economic and social rights; religion and human rights; the prohibition of torture and its relationship to efforts to combat terrorism; contemporary measures to enforce international human rights law through the criminal process; the activities of regional human rights systems and their organs, such as the European Court of Human Rights; and the debate on whether there is a global "responsibility to protect" victims of genocide, war crimes, and crimes against humanity, including through the use of military intervention.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 708 Alternative Dispute Resolution****Crosslisted with:** LAW 708G**Description:** Being a lawyer involves more skills than just knowing the law. Lawyers & litigators, transactional attorneys, and government attorneys alike & must take a critical look at the issues before making any number of decisions that are not based on substantive law. This ADR class is an introduction to negotiation, mediation, arbitration, collaborative law, facilitation, among other topics. Class discussion will resolve around applying skills learned to hypothetical problems. Students also have an opportunity to practice the skills learned in a number of class simulations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 708G Alternative Dispute Resolution**Crosslisted with:** LAW 708

Description: Being a lawyer involves more skills than just knowing the law. Lawyers & litigators, transactional attorneys, and government attorneys alike & must take a critical look at the issues before making any number of decisions that are not based on substantive law. This ADR class is an introduction to negotiation, mediation, arbitration, collaborative law, facilitation, among other topics. Class discussion will resolve around applying skills learned to hypothetical problems. Students also have an opportunity to practice the skills learned in a number of class simulations.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 709 Arbitration****Crosslisted with:** LAW 709G

Notes: Students will need to set aside one Saturday to participate in arbitration hearing simulations, and the course will end two weeks early to take into account the Saturday time.

Description: Offers an in-depth look at the legal and practical issues involved in domestic arbitration, as well as an examination of the skills necessary to be a successful advocate in the arbitral forum. Examines the use of arbitration in a number of different areas, including commercial, consumer, labor, employment, securities, construction, and international disputes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 709G Arbitration****Crosslisted with:** LAW 709

Notes: Students will need to set aside one Saturday to participate in arbitration hearing simulations, and the course will end two weeks early to take into account the Saturday time.

Description: Offers an in-depth look at the legal and practical issues involved in domestic arbitration, as well as an examination of the skills necessary to be a successful advocate in the arbitral forum. Examines the use of arbitration in a number of different areas, including commercial, consumer, labor, employment, securities, construction, and international disputes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 710 Mediation****Crosslisted with:** LAW 710G

Description: Study of the process in which a trained neutral third party assists others in resolving a dispute or planning a transaction. Training in basic mediation skills through readings, demonstrations, simulations, and the keeping of a mediation notebook. Topics include the nature of mediation and its relationship to other forms of dispute resolution, the nature of conflict, models and styles of mediation, negotiation theory, communication skills, the interest-based mediation process, the representation of clients in mediation, special issues relating to attorney mediators, and mediators standards and ethics.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 588, LAW 588G**LAW 710G Mediation****Crosslisted with:** LAW 710

Description: Study of the process in which a trained neutral third party assists others in resolving a dispute or planning a transaction. Training in basic mediation skills through readings, demonstrations, simulations, and the keeping of a mediation notebook. Topics include the nature of mediation and its relationship to other forms of dispute resolution, the nature of conflict, models and styles of mediation, negotiation theory, communication skills, the interest-based mediation process, the representation of clients in mediation, special issues relating to attorney mediators, and mediators standards and ethics.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 588, LAW 588G**LAW 711 Copyright Law****Crosslisted with:** LAW 711G

Description: Protection of literary, musical, artistic, and audiovisual works under the laws of Copyright and Unfair Competition. Topics include the standards for copyright protection; procedural issues including copyright notice, registration, and duration; rules governing copyright infringement and fair use; and issues arising from digital technologies, including the distribution of copyrighted works over the Internet and the use of technological measures to protect copyrighted works.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING

LAW 711G Copyright Law**Crosslisted with:** LAW 711

Description: Protection of literary, musical, artistic, and audiovisual works under the laws of Copyright and Unfair Competition. Topics include the standards for copyright protection; procedural issues including copyright notice, registration, and duration; rules governing copyright infringement and fair use; and issues arising from digital technologies, including the distribution of copyrighted works over the Internet and the use of technological measures to protect copyrighted works.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 712 Law and Literature****Crosslisted with:** LAW 712G

Description: Study the law-in-literature and the law-as-literature. Novelists, poets, and playwrights dramatize the law and legal events in ways that the bare fact patterns of case law cannot. Read literature that examines "the law" as an object of fascination and revulsion. Examine the law-as-literature by reading legal texts using the tools of literary analysis and explore the literary aspects of the law.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 712G Law and Literature****Crosslisted with:** LAW 712

Description: Study the law-in-literature and the law-as-literature. Novelists, poets, and playwrights dramatize the law and legal events in ways that the bare fact patterns of case law cannot. Read literature that examines "the law" as an object of fascination and revulsion. Examine the law-as-literature by reading legal texts using the tools of literary analysis and explore the literary aspects of the law.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 713 Style and Composition in Legal Writing****Crosslisted with:** LAW 713G

Description: Study the various causes of poor legal writing-legal writing that is unnecessarily difficult to read-and attempt to understand what constitutes good legal writing, and what makes it work. Practice writing to develop the characteristics of good writing. Focus on developing clarity, coherence, and concision in legal writing. Develop a better understanding of the linguistic causes of good and bad legal writing, and a set of concrete writing tools for the improvement of their own writing.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 713G Style and Composition in Legal Writing****Crosslisted with:** LAW 713

Description: Study the various causes of poor legal writing-legal writing that is unnecessarily difficult to read-and attempt to understand what constitutes good legal writing, and what makes it work. Practice writing to develop the characteristics of good writing. Focus on developing clarity, coherence, and concision in legal writing. Develop a better understanding of the linguistic causes of good and bad legal writing, and a set of concrete writing tools for the improvement of their own writing.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 714 Comparative Law: International Gender Issues****Crosslisted with:** LAW 714G

Description: Selected problems of international and comparative gender issues in foreign legal systems and their impact on US law. Specific documents that may be discussed include the United States Constitution; US Refugee Law; Violence Against Women Act; International Covenant on Civil and Political Rights; Universal Declaration of Human Rights; United Nations Charter; International Covenant on Economic, Social, and Cultural Rights; International Covenant on Civil and Political Rights; Convention on the Rights of the Child; Convention on the Elimination of All Forms of Discrimination Against Women; and the Declaration of the Elimination of Violence Against Women.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 714G Comparative Law: International Gender Issues****Crosslisted with:** LAW 714

Description: Selected problems of international and comparative gender issues in foreign legal systems and their impact on US law. Specific documents that may be discussed include the United States Constitution; US Refugee Law; Violence Against Women Act; International Covenant on Civil and Political Rights; Universal Declaration of Human Rights; United Nations Charter; International Covenant on Economic, Social, and Cultural Rights; International Covenant on Civil and Political Rights; Convention on the Rights of the Child; Convention on the Elimination of All Forms of Discrimination Against Women; and the Declaration of the Elimination of Violence Against Women.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL

LAW 715 Human Rights and International Criminal Law**Crosslisted with:** LAW 715G

Description: Introduction to several international law topics of current interest and special importance to the international community, particularly related to transnational criminal activities, terrorism, and international criminal law offenses. Specific topics will include: the conclusion, interpretation and termination of international agreements; state sovereignty over land, sea and air; extraterritorial state criminal jurisdiction; nationality; extradition; international criminal law; war crimes; the International Criminal Court, and; the United Nations Charter regime and related structures, including the ad hoc international criminal tribunals.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 715G Human Rights and International Criminal Law****Crosslisted with:** LAW 715

Description: Introduction to several international law topics of current interest and special importance to the international community, particularly related to transnational criminal activities, terrorism, and international criminal law offenses. Specific topics will include: the conclusion, interpretation and termination of international agreements; state sovereignty over land, sea and air; extraterritorial state criminal jurisdiction; nationality; extradition; international criminal law; war crimes; the International Criminal Court, and; the United Nations Charter regime and related structures, including the ad hoc international criminal tribunals.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 716 Comparative Law: International Gender Issues Seminar****Crosslisted with:** LAW 716G

Description: Selected problems of international and comparative gender issues in foreign legal systems and their impact on U.S. law. Documents for discussion include the U.S. Constitution; U.S. Refugee Law; Violence Against Women Act; International Covenant on Civil and Political Rights; Universal Declaration of Human Rights; United National Charter; International Covenant on Economic, Social, and Cultural Rights; International Covenant on Civil and Political Rights; Convention of the Rights of the Child; Convention on the Elimination of All Forms of Discrimination Against Women; and the Declaration on the Elimination of Violence Against Women.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 716G Comparative Law: International Gender Issues Seminar****Crosslisted with:** LAW 716

Description: Selected problems of international and comparative gender issues in foreign legal systems and their impact on U.S. law. Documents for discussion include the U.S. Constitution; U.S. Refugee Law; Violence Against Women Act; International Covenant on Civil and Political Rights; Universal Declaration of Human Rights; United National Charter; International Covenant on Economic, Social, and Cultural Rights; International Covenant on Civil and Political Rights; Convention of the Rights of the Child; Convention on the Elimination of All Forms of Discrimination Against Women; and the Declaration on the Elimination of Violence Against Women.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** FALL**LAW 717 Education Law****Crosslisted with:** LAW 717G

Description: The role that law plays in education in the United States. The rights of students and teachers, special education and disability, school finance, school searches, student discipline, privacy of records, liability of school officials and discrimination based on gender and race. The emerging case law on state constitutional claims of education equity and adequacy.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 717G Education Law****Crosslisted with:** LAW 717

Description: The role that law plays in education in the United States. The rights of students and teachers, special education and disability, school finance, school searches, student discipline, privacy of records, liability of school officials and discrimination based on gender and race. The emerging case law on state constitutional claims of education equity and adequacy.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 718 Forced Migration and Human Rights: Refugees, Asylees, IDPs, Victims of Trafficking**Crosslisted with:** LAW 718G**Notes:** Students who have previously taken Refugee and Asylum Law and Practice (Law 653) may not enroll in this course.**Description:** Examination of refugee issues in the context of domestic and international political environments. Topics include asylum reform, gender-based persecution, persecution of gays and lesbians, deficiencies in international and domestic refugee law, and firm resettlement of displaced persons. Interdisciplinary focus: considers the interplay among political, social, economic, cultural and psychological phenomena as refugees, governments of host countries, and international and non-governmental organizations interact in the context of ongoing crises around the world.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 718G Forced Migration and Human Rights: Refugees, Asylees, IDPs, Victims of Trafficking****Crosslisted with:** LAW 718**Notes:** Students who have previously taken Refugee and Asylum Law and Practice (Law 653) may not enroll in this course.**Description:** Examination of refugee issues in the context of domestic and international political environments. Topics include asylum reform, gender-based persecution, persecution of gays and lesbians, deficiencies in international and domestic refugee law, and firm resettlement of displaced persons. Interdisciplinary focus: considers the interplay among political, social, economic, cultural and psychological phenomena as refugees, governments of host countries, and international and non-governmental organizations interact in the context of ongoing crises around the world.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 719 National Security Law****Description:** Examines international and U.S. law relevant to the handling of national security matters. Studies the allocation of power under the Constitution between Congress and the President with respect to war powers and assess the role of the courts as a check on the political branches in this area, particularly as it relates to ongoing efforts to fight terrorism. Analyzes the military detention of suspected terrorists and their trial by military commissions. Focuses on international law governing the use of force, conflict management and collective security arrangements. Special attention will be given to the U.N. Charter, the doctrine of self-defense, arguments setting forth justifications for the unilateral use of force, intervention in internal conflicts, and the institutional framework for collective efforts to maintain international peace and security, including peacekeeping operations and peace enforcement actions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 720 Advocacy in Mediation****Crosslisted with:** LAW 720G**Description:** Considers the differing roles of the neutral and the advocate in mediation, focusing on representing clients in all aspects of the mediation process. Represent clients in drafting agreements to mediate, preparing for mediation, attending mediation sessions, and drafting mediation settlements. Covers issues such as confidentiality and ethics. Employs role-play and drafting exercises, in addition to class discussions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 720G Advocacy in Mediation****Crosslisted with:** LAW 720**Description:** Considers the differing roles of the neutral and the advocate in mediation, focusing on representing clients in all aspects of the mediation process. Represent clients in drafting agreements to mediate, preparing for mediation, attending mediation sessions, and drafting mediation settlements. Covers issues such as confidentiality and ethics. Employs role-play and drafting exercises, in addition to class discussions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 722 Agricultural Environmental Law****Crosslisted with:** LAW 722G**Description:** Environmental law in agriculture, the Clean Water Act as it applies to agriculture, the environmental and conservative provisions of the farm program, pesticide regulation and liability, and other areas where environmental concerns and the agriculture industry intersect.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 722G Agricultural Environmental Law****Crosslisted with:** LAW 722**Description:** Environmental law in agriculture, the Clean Water Act as it applies to agriculture, the environmental and conservative provisions of the farm program, pesticide regulation and liability, and other areas where environmental concerns and the agriculture industry intersect.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 723 Securities Brokers, Mutual Funds, and Investment Advisers**Crosslisted with:** LAW 723G**Prerequisites:** LAW 632/G**Notes:** Neither securities regulation or any knowledge of federal securities law is a prerequisite for this course.**Description:** Regulation of brokers and investment advisers by federal securities law: regulation of brokers under the Securities Exchange Act; regulation of investment companies under the Investment Company Act; and regulation of investment advisers under the Investment Advisers Act.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 723G Securities Brokers, Mutual Funds, and Investment Advisers****Crosslisted with:** LAW 723**Prerequisites:** LAW 632/G**Notes:** Neither securities regulation or any knowledge of federal securities law is a prerequisite for this course.**Description:** Regulation of brokers and investment advisers by federal securities law: regulation of brokers under the Securities Exchange Act; regulation of investment companies under the Investment Company Act; and regulation of investment advisers under the Investment Advisers Act.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 724 Domestic Spectrum Law and Policy****Crosslisted with:** LAW 724G**Notes:** This course is available to online LL.M. students.**Description:** Provides an overview of the law and policy governing spectrum management in the United States. Broad coverage includes spectrum allocation and domestic assignment, the FCC/NITA jurisdictional split, and Title III of the Communications Act. Specific coverage includes spectrum auctions, the debate over licensed and unlicensed spectrum use, and issues related to licensing satellite spectrum for use in the U.S.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 724G Domestic Spectrum Law and Policy****Crosslisted with:** LAW 724**Notes:** This course is available to online LL.M. students.**Description:** Provides an overview of the law and policy governing spectrum management in the United States. Broad coverage includes spectrum allocation and domestic assignment, the FCC/NITA jurisdictional split, and Title III of the Communications Act. Specific coverage includes spectrum auctions, the debate over licensed and unlicensed spectrum use, and issues related to licensing satellite spectrum for use in the U.S.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 725 Economic Justice Seminar****Crosslisted with:** LAW 725G**Description:** A social justice critique of free markets. The relationship of legal rules to the distribution of wealth. Introduction of a range of materials and critique the economic theory underlying various approaches to law and economics. Readings will include an interdisciplinary perspective Current topics in economic inequality, e.g., access to credit, housing and others.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 725G Economic Justice Seminar****Crosslisted with:** LAW 725**Description:** A social justice critique of free markets. The relationship of legal rules to the distribution of wealth. Introduction of a range of materials and critique the economic theory underlying various approaches to law and economics. Readings will include an interdisciplinary perspective Current topics in economic inequality, e.g., access to credit, housing and others.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 726 Domestic Telecommunications Law****Crosslisted with:** LAW 726G**Notes:** Available to online LLM students.**Description:** Addresses the legal framework applied in the United States to telecommunications and media industries, including the Internet, landline telephone, broadcast radio and television, cable television, and mobile technologies. Substantial attention is given to current regulatory issues involving the Internet and online video, the structure and power of the Federal Communications Commission, and economic, technological, and speech concerns, including understanding the role of and challenges created by the use of advocacy in public policy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 726G Domestic Telecommunications Law****Crosslisted with:** LAW 726**Notes:** Available to online LLM students.**Description:** Addresses the legal framework applied in the United States to telecommunications and media industries, including the Internet, landline telephone, broadcast radio and television, cable television, and mobile technologies. Substantial attention is given to current regulatory issues involving the Internet and online video, the structure and power of the Federal Communications Commission, and economic, technological, and speech concerns, including understanding the role of and challenges created by the use of advocacy in public policy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 728 Statutory Interpretation: Practice & Policy**Crosslisted with:** LAW 728G**Description:** Focuses on the tools lawyers utilize when they interpret statutes. Examines various theories and canons of statutory interpretation and to issues of statutory interpretation involving administrative agencies. Provides a comprehensive approach to wrestling with the problems that arise during statutory interpretation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 728G Statutory Interpretation: Practice & Policy****Crosslisted with:** LAW 728**Description:** Focuses on the tools lawyers utilize when they interpret statutes. Examines various theories and canons of statutory interpretation and to issues of statutory interpretation involving administrative agencies. Provides a comprehensive approach to wrestling with the problems that arise during statutory interpretation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 729 Civil Rights Litigation****Crosslisted with:** LAW 729G**Prerequisites:** LAW 516/G, 517/G and 609/G**Description:** Major substantive and procedural issues in litigation to protect civil rights. Established theories of liability and defenses, possible new developments in legal doctrine, and pending statutory changes.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 729G Civil Rights Litigation****Crosslisted with:** LAW 729**Prerequisites:** LAW 516/G, 517/G and 609/G**Description:** Major substantive and procedural issues in litigation to protect civil rights. Established theories of liability and defenses, possible new developments in legal doctrine, and pending statutory changes.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 730 Technology and the Practice of Law****Crosslisted with:** LAW 730G**Description:** Designed to provide a basis understanding of the impact of technology on the practice of law and the benefits and risks associated with using technology in client representation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 730G Technology and the Practice of Law****Crosslisted with:** LAW 730**Description:** Designed to provide a basis understanding of the impact of technology on the practice of law and the benefits and risks associated with using technology in client representation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 731 Tribal Gaming Law Seminar****Crosslisted with:** LAW 731G**Description:** Examines the history of tribal gaming, the landmark case of California v. Cabazon Band of Mission Indians, 480 U.S. 202 (1987) and the resulting Indian Gaming Regulatory Act (IGRA). Tribal gaming is regulated by tribal, federal, and state law and is a complex mix of issues: what constitutes a tribe and tribal lands; how do newly acquired lands become Indian Country; what is the role, structure, and authority of the National Indian Gaming Commission; what defines and distinguishes Class I, Class II and Class III gaming; how are tribal - state compacts formed; who may claim a portion of gaming revenues through fees or taxes; and what institutions and political players are crucial to the public debates on tribal and state revenue sharing, tribal economic development, and off-reservation casinos.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 731G Tribal Gaming Law Seminar****Crosslisted with:** LAW 731**Description:** Examines the history of tribal gaming, the landmark case of California v. Cabazon Band of Mission Indians, 480 U.S. 202 (1987) and the resulting Indian Gaming Regulatory Act (IGRA). Tribal gaming is regulated by tribal, federal, and state law and is a complex mix of issues: what constitutes a tribe and tribal lands; how do newly acquired lands become Indian Country; what is the role, structure, and authority of the National Indian Gaming Commission; what defines and distinguishes Class I, Class II and Class III gaming; how are tribal - state compacts formed; who may claim a portion of gaming revenues through fees or taxes; and what institutions and political players are crucial to the public debates on tribal and state revenue sharing, tribal economic development, and off-reservation casinos.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 732 Constitutional Law II**Crosslisted with:** LAW 732G**Notes:** LAW 609G is not a prerequisite for this course.**Description:** Emphasizes protected individual civil liberties. The origin and modern applicability of the state action concept in constitutional litigation; the scope of congressional power to enforce the post Civil War amendments; freedom of speech, association, and press; and constitutional principles enforcing the first amendment's command that "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 732G Constitutional Law II****Crosslisted with:** LAW 732**Notes:** LAW 609G is not a prerequisite for this course.**Description:** Emphasizes protected individual civil liberties. The origin and modern applicability of the state action concept in constitutional litigation; the scope of congressional power to enforce the post Civil War amendments; freedom of speech, association, and press; and constitutional principles enforcing the first amendment's command that "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 733 Advanced Legal Research****Crosslisted with:** LAW 733G**Description:** Provides a deeper, more intimate exposure to the material of legal research. Emphasis will be on practical skills and the nature and philosophies of the organization and production of the materials themselves. Gain the ability to analyze any research problem in terms of the types of materials that may be of use in answering the question.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 733G Advanced Legal Research****Crosslisted with:** LAW 733**Description:** Provides a deeper, more intimate exposure to the material of legal research. Emphasis will be on practical skills and the nature and philosophies of the organization and production of the materials themselves. Gain the ability to analyze any research problem in terms of the types of materials that may be of use in answering the question.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 734 Export Control Law: International Traffic in Arms Regulations****Crosslisted with:** LAW 734G**Notes:** This course is available to online LL.M. students.**Description:** Provides an extensive examination of the International Traffic in Arms Regulations (ITAR), the Export Administration Act, U.S. economic embargos and related Executive Orders, as well as discussion of the foreign policy and national security interests influencing US laws, regulations and policy. Particular emphasis will be given to the ongoing efforts to reform the US export control system with regard to spacecraft.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 734G Export Control Law: International Traffic in Arms Regulations****Crosslisted with:** LAW 734**Notes:** This course is available to online LL.M. students.**Description:** Provides an extensive examination of the International Traffic in Arms Regulations (ITAR), the Export Administration Act, U.S. economic embargos and related Executive Orders, as well as discussion of the foreign policy and national security interests influencing US laws, regulations and policy. Particular emphasis will be given to the ongoing efforts to reform the US export control system with regard to spacecraft.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 736 Bankruptcy****Crosslisted with:** LAW 736G**Notes:** This is a survey course.**Description:** Provides an overview of the relationship between debtors and creditors outside of bankruptcy under state law. Includes an examination of the Federal Debt Collection Practices Act and of consumer and business bankruptcy law. Specifically, Chapter 7, 11, 12 and 13 proceedings are discussed. Engage in a client counseling exercise designed to evaluate the client's eligibility for a Chapter 7 proceeding and prepare for electronic filing a Chapter 13 petition for bankruptcy. Prepare a short, client-counseling memorandum for the unit on business bankruptcies related to a motion for relief from the automatic stay. Current policy issues in bankruptcy will be addressed as time permits.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 736G Bankruptcy**Crosslisted with:** LAW 736**Notes:** This is a survey course.

Description: Provides an overview of the relationship between debtors and creditors outside of bankruptcy under state law. Includes an examination of the Federal Debt Collection Practices Act and of consumer and business bankruptcy law. Specifically, Chapter 7, 11, 12 and 13 proceedings are discussed. Engage in a client counseling exercise designed to evaluate the client's eligibility for a Chapter 7 proceeding and prepare for electronic filing a Chapter 13 petition for bankruptcy. Prepare a short, client-counseling memorandum for the unit on business bankruptcies related to a motion for relief from the automatic stay. Current policy issues in bankruptcy will be addressed as time permits.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 737 Law of Provider and Patient****Crosslisted with:** LAW 737G

Notes: Students may also enroll in LAW 713G Style and Composition in Legal Writing for an additional hour of Law College credit.

Description: Covers a limited but central topic in the larger field of health-care law - the law bearing on the relationship between a health-care provider and a patient. Survey the legal rights and obligations of patients and their health care providers, individual and institutional. Cover qualification as a health care provider (institutional and individual licensure); the legal doctrines relating to the formation of provider-patient relationship; the locus of decisional authority in the relationship; the provider's fiduciary duties to the patient (to deliver care of professionally acceptable quality [including traditional malpractice law], to avoid conflicts of interest, to respect the patient's privacy and to protect the confidentiality of medical information about the patient); the reciprocal obligation of the patient to take reasonable steps to assure payment and to comply with medical directives; and the legal doctrines relating to the termination of provider-patient relationships. Explore the way provider-patient obligations are affected when the patient also becomes the subject of medical or scientific research.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 737G Law of Provider and Patient****Crosslisted with:** LAW 737

Notes: Students may also enroll in LAW 713G Style and Composition in Legal Writing for an additional hour of Law College credit.

Description: Covers a limited but central topic in the larger field of health-care law - the law bearing on the relationship between a health-care provider and a patient. Survey the legal rights and obligations of patients and their health care providers, individual and institutional. Cover qualification as a health care provider (institutional and individual licensure); the legal doctrines relating to the formation of provider-patient relationship; the locus of decisional authority in the relationship; the provider's fiduciary duties to the patient (to deliver care of professionally acceptable quality [including traditional malpractice law], to avoid conflicts of interest, to respect the patient's privacy and to protect the confidentiality of medical information about the patient); the reciprocal obligation of the patient to take reasonable steps to assure payment and to comply with medical directives; and the legal doctrines relating to the termination of provider-patient relationships. Explore the way provider-patient obligations are affected when the patient also becomes the subject of medical or scientific research.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 739 Criminal Law II****Crosslisted with:** LAW 739G

Description: Scope and content of federal crimes. Fraud and political corruption, drug trafficking, money laundering, organized crime, false statement, obstruction of justice and federal sentencing guidelines.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 739G Criminal Law II****Crosslisted with:** LAW 739

Description: Scope and content of federal crimes. Fraud and political corruption, drug trafficking, money laundering, organized crime, false statement, obstruction of justice and federal sentencing guidelines.

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 740 Negotiations****Crosslisted with:** LAW 740G

Description: Examines a variety of negotiation styles and applies these styles in a series of increasingly complex negotiation problems. Negotiation problems will include plea bargains, personal injury cases, commercial negotiations and labor management disputes. Strategic and psychological factors present in negotiation styles will be examined. Improve negotiation performance and broaden the repertoire of strategic and stylistic choices available.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

LAW 740G Negotiations**Crosslisted with:** LAW 740

Description: Examines a variety of negotiation styles and applies these styles in a series of increasingly complex negotiation problems. Negotiation problems will include plea bargains, personal injury cases, commercial negotiations and labor management disputes. Strategic and psychological factors present in negotiation styles will be examined. Improve negotiation performance and broaden the repertoire of strategic and stylistic choices available.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 741 Pretrial Litigation****Crosslisted with:** LAW 741G

Description: Concentrates on the application of procedural rules to the bringing and defending of civil law suits and on considering the tactical and strategic aspects of litigation. Perform weekly exercises on pleading, motion practice and discovery.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 798, LAW 798G; LAW 798B**LAW 741G Pretrial Litigation****Crosslisted with:** LAW 741

Description: Concentrates on the application of procedural rules to the bringing and defending of civil law suits and on considering the tactical and strategic aspects of litigation. Perform weekly exercises on pleading, motion practice and discovery.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 798, LAW 798G; LAW 798B**LAW 743 Remedies and Damages****Crosslisted with:** LAW 743G

Description: Examination of the basic remedies available to redress legal wrongs: injunctions, damages, and restitution. Among the topics covered are permanent injunctions (including specific performance), provisional injunctions, contempt, contract damages, tort damages (primarily personal injury and property damages), proof requirements, present value adjustments, legal restitution, equitable restitution, equitable defenses, election of remedies, and declaratory relief.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 743G Remedies and Damages****Crosslisted with:** LAW 743

Description: Examination of the basic remedies available to redress legal wrongs: injunctions, damages, and restitution. Among the topics covered are permanent injunctions (including specific performance), provisional injunctions, contempt, contract damages, tort damages (primarily personal injury and property damages), proof requirements, present value adjustments, legal restitution, equitable restitution, equitable defenses, election of remedies, and declaratory relief.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 744 Legislation and the Political Process****Crosslisted with:** LAW 744G

Description: This course will examine the basic structure of American legislative institutions and the process of law-making with emphasis on legislative process and external influences shaping the consideration, composition, enactment and implementation of new laws. The course will draw on real-world, "hot topic" issues for various practical exercises, including the drafting of statutes and written comments for agency and congressional submission. In addition, the course will familiarize students with various kinds of materials, including bills, committee reports, legislative rules, floor debates, and statutes. Collectively, these exercises and readings will allow the class to fully explore and evaluate the legislative process in its various contexts.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 744G Legislation and the Political Process****Crosslisted with:** LAW 744

Description: This course will examine the basic structure of American legislative institutions and the process of law-making with emphasis on legislative process and external influences shaping the consideration, composition, enactment and implementation of new laws. The course will draw on real-world, "hot topic" issues for various practical exercises, including the drafting of statutes and written comments for agency and congressional submission. In addition, the course will familiarize students with various kinds of materials, including bills, committee reports, legislative rules, floor debates, and statutes. Collectively, these exercises and readings will allow the class to fully explore and evaluate the legislative process in its various contexts.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 745 Taxation-Partnership****Crosslisted with:** LAW 745G**Prerequisites:** LAW 637/637G

Description: Introduction to the fundamental federal income tax rules for general and limited partnerships, limited liability partnerships and limited liability companies.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 745G Taxation-Partnership**Crosslisted with:** LAW 745**Prerequisites:** LAW 637/637G**Description:** Introduction to the fundamental federal income tax rules for general and limited partnerships, limited liability partnerships and limited liability companies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 746 Corporate Finance****Crosslisted with:** LAW 746G**Prerequisites:** LAW 632/G**Description:** Introduction to the theories and applications of modern corporate finance. Explores a range of topics, including basic finance theories (time value of money, the efficient capital market hypothesis, the capital asset pricing model, standard deviation, etc.), the various forms of corporate finance (common stock, debt, preferred stock, options, etc.), and the documentation associated with financing transactions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 746G Corporate Finance****Crosslisted with:** LAW 746**Prerequisites:** LAW 632/G**Description:** Introduction to the theories and applications of modern corporate finance. Explores a range of topics, including basic finance theories (time value of money, the efficient capital market hypothesis, the capital asset pricing model, standard deviation, etc.), the various forms of corporate finance (common stock, debt, preferred stock, options, etc.), and the documentation associated with financing transactions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 747 National Security Space Law****Crosslisted with:** LAW 747G**Notes:** This course is available to online LL.M. students.**Description:** Addresses the national security aspects of space law, including legal issues related to new and emerging space technologies. Includes an examination of key space arms control issues, U.S. national security space strategy, U.S. military space doctrine, the international law framework governing military uses of space and space weapons, significant contemporary challenges and initiatives in the area of national security space law, and efforts to prevent an arms race in outer space and its weaponization.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 747G National Security Space Law****Crosslisted with:** LAW 747**Notes:** This course is available to online LL.M. students.**Description:** Addresses the national security aspects of space law, including legal issues related to new and emerging space technologies. Includes an examination of key space arms control issues, U.S. national security space strategy, U.S. military space doctrine, the international law framework governing military uses of space and space weapons, significant contemporary challenges and initiatives in the area of national security space law, and efforts to prevent an arms race in outer space and its weaponization.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 748 Space Law****Crosslisted with:** LAW 748G**Description:** Provides a basic overview of international space law with primary emphasis on the civilian and commercial dimensions of space law and policy, including civilian government space, satellite launch, satellite navigation, and satellite remote sensing. Topics will include the five major international treaties dealing directly with space and the application of these Cold-War era treaties to modern space activities.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 766, LAW 766G**LAW 748G Space Law****Crosslisted with:** LAW 748**Description:** Provides a basic overview of international space law with primary emphasis on the civilian and commercial dimensions of space law and policy, including civilian government space, satellite launch, satellite navigation, and satellite remote sensing. Topics will include the five major international treaties dealing directly with space and the application of these Cold-War era treaties to modern space activities.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 766, LAW 766G**LAW 749 Commercial Law Seminar****Crosslisted with:** LAW 749G**Description:** Students write and present a paper addressing an area of interest in commercial or banking law. Increasingly, attorneys are facing new legal dilemmas posed by several developments in commercial practices. Explores several current issues in commercial and banking law. Includes "Technology and the Uniform Commercial Code," "Consumer Protection and the UCC," "Banks and Community Needs" and various issues arising from proposed revisions to the Uniform Commercial Code (UCC).**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

LAW 749G Commercial Law Seminar**Crosslisted with:** LAW 749

Description: Students write and present a paper addressing an area of interest in commercial or banking law. Increasingly, attorneys are facing new legal dilemmas posed by several developments in commercial practices. Explores several current issues in commercial and banking law. Includes "Technology and the Uniform Commercial Code," "Consumer Protection and the UCC," "Banks and Community Needs" and various issues arising from proposed revisions to the Uniform Commercial Code (UCC).

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 750 American Foreign Affairs Law and Policy Seminar****Crosslisted with:** LAW 750G

Prerequisites: Previous enrollment in an international law course recommended

Notes: Previous enrollment in an international law course recommended. Available to online LL.M. students.

Description: Explores structural/organizational issues (e.g., separation of powers, federalism) related to U.S. foreign policy-making as well as U.S. foreign policy in a number of substantive areas. Areas of foreign policy examined include the war on terrorism, international economy policy, and current foreign policy crises.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 750G American Foreign Affairs Law and Policy Seminar****Crosslisted with:** LAW 750

Prerequisites: Previous enrollment in an international law course recommended

Notes: Previous enrollment in an international law course recommended. Available to online LL.M. students.

Description: Explores structural/organizational issues (e.g., separation of powers, federalism) related to U.S. foreign policy-making as well as U.S. foreign policy in a number of substantive areas. Areas of foreign policy examined include the war on terrorism, international economy policy, and current foreign policy crises.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 751 Employee Benefits Law****Crosslisted with:** LAW 751G

Description: Study of the federal laws that govern retirement, health care, and other benefit plans sponsored by private employers for their employees. Topics include: employer compliance requirements under the Internal Revenue Code, the Employee Retirement Income Security Act of 1974, and the Affordable Care Act; the responsibilities of plan fiduciaries; federal claims and remedies available to plan participants; and federal preemption of state laws. Uses an applied problem method of learning and is designed for students who plan to practice in the areas of corporate law, employment litigation, insurance litigation, family law, or estate planning.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 751G Employee Benefits Law****Crosslisted with:** LAW 751

Description: Study of the federal laws that govern retirement, health care, and other benefit plans sponsored by private employers for their employees. Topics include: employer compliance requirements under the Internal Revenue Code, the Employee Retirement Income Security Act of 1974, and the Affordable Care Act; the responsibilities of plan fiduciaries; federal claims and remedies available to plan participants; and federal preemption of state laws. Uses an applied problem method of learning and is designed for students who plan to practice in the areas of corporate law, employment litigation, insurance litigation, family law, or estate planning.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 752 Labor and Employment Law: Theory and Practice****Crosslisted with:** LAW 752G

Description: The class will have a limited enrollment. Preference given to students who have earned at least 6 credits from the following courses: Civil Rights Litigation, Civil Rights Litigation Seminar, Employment Law, Employment Law Seminar, Labor Law, Labor Law Seminar, Legal Control of Discrimination, Legal Control of Discrimination Seminar, Pension and Employee Benefit Law, Public Employment Law. A modest bridge between classroom instruction in labor and employment law and real world practice in the area. Local practitioners collaborate with faculty member to formulate problems for the class and participate in several class sessions. Students engage in intensive analysis of issues arising out of the problems; they may be asked to prepare and discuss work products that fall anywhere on a continuum between the scholarly (such as law review-type analyses of complex issues) and the intensely practical (such as drafting interrogatories).

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

LAW 752G Labor and Employment Law: Theory and Practice**Crosslisted with:** LAW 752

Description: The class will have a limited enrollment. Preference given to students who have earned at least 6 credits from the following courses: Civil Rights Litigation, Civil Rights Litigation Seminar, Employment Law, Employment Law Seminar, Labor Law, Labor Law Seminar, Legal Control of Discrimination, Legal Control of Discrimination Seminar, Pension and Employee Benefit Law, Public Employment Law. A modest bridge between classroom instruction in labor and employment law and real world practice in the area. Local practitioners collaborate with faculty member to formulate problems for the class and participate in several class sessions. Students engage in intensive analysis of issues arising out of the problems; they may be asked to prepare and discuss work products that fall anywhere on a continuum between the scholarly (such as law review-type analyses of complex issues) and the intensely practical (such as drafting interrogatories).

Credit Hours: 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**LAW 753 Labor Law****Crosslisted with:** LAW 753G

Description: Legislative and judicial patterns of the modern labor movement; the objectives of labor combinations; the forms of pressure employed for their realization and prevention; strikes, boycotts, picketing, and lockouts; the legal devices utilized in carving out the permissible bounds of damage suits involving labor activity; the labor injunction; the National Labor Relations Board; the nature of collective bargaining agreements; extra legal procedure for settling labor disputes-the techniques of mediation, conciliation, and arbitration.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 585, LAW 585G**LAW 753G Labor Law****Crosslisted with:** LAW 753

Description: Legislative and judicial patterns of the modern labor movement; the objectives of labor combinations; the forms of pressure employed for their realization and prevention; strikes, boycotts, picketing, and lockouts; the legal devices utilized in carving out the permissible bounds of damage suits involving labor activity; the labor injunction; the National Labor Relations Board; the nature of collective bargaining agreements; extra legal procedure for settling labor disputes-the techniques of mediation, conciliation, and arbitration.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** LAW 585, LAW 585G**LAW 754 Federal Courts****Crosslisted with:** LAW 754G

Description: Advanced study of United States constitutional law in the litigational context and focused on the power, history, and development of the federal judicial system and the distribution of power between the federal and state systems.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 754G Federal Courts****Crosslisted with:** LAW 754

Description: Advanced study of United States constitutional law in the litigational context and focused on the power, history, and development of the federal judicial system and the distribution of power between the federal and state systems.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 755 Products Liability****Crosslisted with:** LAW 755G

Description: In-depth study of the common law and statutory systems regulating liability for product-caused injuries. Private causes of action are the focus, but they may also be contrasted with administrative regulations which govern the sale and distribution of products.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 755G Products Liability****Crosslisted with:** LAW 755

Description: In-depth study of the common law and statutory systems regulating liability for product-caused injuries. Private causes of action are the focus, but they may also be contrasted with administrative regulations which govern the sale and distribution of products.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

LAW 756 International Cyber Security: Mischief, Crime and Warfare**Crosslisted with:** LAW 756G**Notes:** This course is available to online LLM students.

Description: Examines international legal issues related to emerging conflicts in cyberspace and explores threats to international cyber security posed by a wide range of hostile cyber acts, from damaging cyber mischief and crime to cyber warfare. The primary focus is on the legal frameworks that may apply to hostile acts in cyber space, including the domestic criminal laws of states, international law, and particularly the law of armed conflict. Compares various forms of cybercrime with state-sponsored efforts to disrupt, deny, degrade or destroy information in computer networks and systems, explores private and governmental roles in cyberspace, and assesses the appropriate legal responses to increasingly diverse state-sponsored military and intelligence operations in cyberspace, including those related to data exploitation, espionage and sabotage.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 756G International Cyber Security: Mischief, Crime and Warfare****Crosslisted with:** LAW 756**Notes:** This course is available to online LLM students.

Description: Examines international legal issues related to emerging conflicts in cyberspace and explores threats to international cyber security posed by a wide range of hostile cyber acts, from damaging cyber mischief and crime to cyber warfare. The primary focus is on the legal frameworks that may apply to hostile acts in cyber space, including the domestic criminal laws of states, international law, and particularly the law of armed conflict. Compares various forms of cybercrime with state-sponsored efforts to disrupt, deny, degrade or destroy information in computer networks and systems, explores private and governmental roles in cyberspace, and assesses the appropriate legal responses to increasingly diverse state-sponsored military and intelligence operations in cyberspace, including those related to data exploitation, espionage and sabotage.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 757 Psycholegal Research Other than Thesis I****Crosslisted with:** LAW 757G

Notes: Absent the prior approval of the Dean, only those students enrolled in the Law/Psychology Joint Degree Program may register for this course. Absent the prior approval of the Dean, no student may take more than six hours of Research in a Selected Field and/or Psycholegal Research.

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Offered:** ALL**LAW 757G Psycholegal Research Other than Thesis I****Crosslisted with:** LAW 757

Notes: Absent the prior approval of the Dean, only those students enrolled in the Law/Psychology Joint Degree Program may register for this course. Absent the prior approval of the Dean, no student may take more than six hours of Research in a Selected Field and/or Psycholegal Research.

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Offered:** ALL**LAW 758 Psycholegal Research Other than Thesis II****Crosslisted with:** LAW 758G

Notes: Absent the prior approval of the Dean, only those students enrolled in the Law/Psychology Joint Degree Program may register for this course. Absent the prior approval of the Dean, no student may take more than six hours of Research in a Selected Field and/or Psycholegal Research.

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Offered:** ALL**LAW 758G Psycholegal Research Other than Thesis II****Crosslisted with:** LAW 758

Notes: Absent the prior approval of the Dean, only those students enrolled in the Law/Psychology Joint Degree Program may register for this course. Absent the prior approval of the Dean, no student may take more than six hours of Research in a Selected Field and/or Psycholegal Research.

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**Offered:** ALL**LAW 759 Employment Law Seminar****Crosslisted with:** LAW 759G

Description: Selected current national and state legal issues pertaining to private and public employment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 759G Employment Law Seminar**Crosslisted with:** LAW 759**Description:** Selected current national and state legal issues pertaining to private and public employment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 760 Arms Control: Problems of Law and Technology****Crosslisted with:** LAW 760G**Description:** Examines the historical, political and strategic foundations of contemporary arms control and disarmament regimes and will evaluate the nature and effectiveness of supporting legal frameworks. Specific topics will include: prohibited weapons under international law; agreements banning various conventional weapons; the successes and failures of the Chemical Weapons Convention and the Biological Weapons Convention; nuclear arms limitation agreements and underlying nuclear deterrence doctrines; the Nuclear Non-Proliferation Agreement, and; future arms control initiatives related to new and emerging new military technologies.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 760G Arms Control: Problems of Law and Technology****Crosslisted with:** LAW 760**Description:** Examines the historical, political and strategic foundations of contemporary arms control and disarmament regimes and will evaluate the nature and effectiveness of supporting legal frameworks. Specific topics will include: prohibited weapons under international law; agreements banning various conventional weapons; the successes and failures of the Chemical Weapons Convention and the Biological Weapons Convention; nuclear arms limitation agreements and underlying nuclear deterrence doctrines; the Nuclear Non-Proliferation Agreement, and; future arms control initiatives related to new and emerging new military technologies.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** SPRING**LAW 761 Trial Advocacy****Crosslisted with:** LAW 761G**Prerequisites:** LAW 646/G**Description:** Students perform weekly exercises which are videotaped and critiqued and will try a case. Fundamentals of trial practice. Emphasis on questioning witnesses, selecting and addressing the jury, and admitting items into evidence.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 782, LAW 782G; LAW 799, LAW 799G**LAW 761G Trial Advocacy****Crosslisted with:** LAW 761**Prerequisites:** LAW 646/G**Description:** Students perform weekly exercises which are videotaped and critiqued and will try a case. Fundamentals of trial practice. Emphasis on questioning witnesses, selecting and addressing the jury, and admitting items into evidence.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 782, LAW 782G; LAW 799, LAW 799G**LAW 762 Law and Behavioral Science****Crosslisted with:** LAW 762G**Description:** Examines actual and potential uses of social scientific research findings and theories in the law and the methods for evaluating the quality and application of social scientific evidence. The uses of social scientific evidence to determine facts, to make law, to provide contextual background for legal decisions, to plan litigation and to assess the functioning of the legal system are examined in a variety of substantive areas. Topical coverage includes: establishing community standards in obscenity cases, the death penalty, research ethics, explaining and predicting behavior, jury decision making, eyewitness reliability and pretrial publicity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 762G Law and Behavioral Science****Crosslisted with:** LAW 762**Description:** Examines actual and potential uses of social scientific research findings and theories in the law and the methods for evaluating the quality and application of social scientific evidence. The uses of social scientific evidence to determine facts, to make law, to provide contextual background for legal decisions, to plan litigation and to assess the functioning of the legal system are examined in a variety of substantive areas. Topical coverage includes: establishing community standards in obscenity cases, the death penalty, research ethics, explaining and predicting behavior, jury decision making, eyewitness reliability and pretrial publicity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

LAW 763 Mental Health Law**Crosslisted with:** LAW 763G**Notes:** Credit may only be earned in either LAW 763G or LAW 772G. Students who have previously taken, or are currently enrolled in, Mental Health Law Seminar (Law 772/G) may not enroll in this course.**Description:** Addresses both civil and criminal issues that are likely to arise in practice. These include: civil competence for a variety of purposes; civil guardianship and conservatorship; civil commitment; confidentiality and privilege; health care provider liability in the context of mental health care; competence to proceed at several stages of the criminal process; criminal responsibility; and criminal sentencing. Critical review of the mental health laws throughout the nation and their psychological foundations. Emphasis on the research that illuminates the problems facing mental health law, system, and processes and the available solutions. Includes the insanity defense, competency to stand trial, guardianship, conservatorship, and civil commitment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 763G Mental Health Law****Crosslisted with:** LAW 763**Notes:** Credit may only be earned in either LAW 763G or LAW 772G. Students who have previously taken, or are currently enrolled in, Mental Health Law Seminar (Law 772/G) may not enroll in this course.**Description:** Addresses both civil and criminal issues that are likely to arise in practice. These include: civil competence for a variety of purposes; civil guardianship and conservatorship; civil commitment; confidentiality and privilege; health care provider liability in the context of mental health care; competence to proceed at several stages of the criminal process; criminal responsibility; and criminal sentencing. Critical review of the mental health laws throughout the nation and their psychological foundations. Emphasis on the research that illuminates the problems facing mental health law, system, and processes and the available solutions. Includes the insanity defense, competency to stand trial, guardianship, conservatorship, and civil commitment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 764 Topics in Law and Psychology I****Crosslisted with:** LAW 764G**Description:** In-depth analysis of specific psycholegal topics. Previous course titles have included Aging and the Law, Eyewitness Testimony, Privacy, Mental Health Policy, Legal Decision Making, Jurors/Jury Decision Making, Institutional Reform and Deinstitutionalization, Legal Policy and Child Development, Domestic Violence, Psychological Testimony in Criminal Cases: Battered Women's Cases, Expert Evidence, Children and the Law, and Psychology and Family Law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 764G Topics in Law and Psychology I****Crosslisted with:** LAW 764**Description:** In-depth analysis of specific psycholegal topics. Previous course titles have included Aging and the Law, Eyewitness Testimony, Privacy, Mental Health Policy, Legal Decision Making, Jurors/Jury Decision Making, Institutional Reform and Deinstitutionalization, Legal Policy and Child Development, Domestic Violence, Psychological Testimony in Criminal Cases: Battered Women's Cases, Expert Evidence, Children and the Law, and Psychology and Family Law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**LAW 765 Law and Practice of the United Nations****Crosslisted with:** LAW 765G**Notes:** This course available to online LLM students.**Description:** This course explores the structure and institutional rules of the United Nations (including an examination of the UN Charter, membership rules, law-making powers, and financing), the major powers and responsibilities of the institution (including development, peace operations, sanctions, and humanitarian assistance), its privileges and immunities, and current major controversies connected with the United Nations. The course concludes with a look at possible reforms to the United Nations System.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL**LAW 765G Law and Practice of the United Nations****Crosslisted with:** LAW 765**Notes:** This course available to online LLM students.**Description:** This course explores the structure and institutional rules of the United Nations (including an examination of the UN Charter, membership rules, law-making powers, and financing), the major powers and responsibilities of the institution (including development, peace operations, sanctions, and humanitarian assistance), its privileges and immunities, and current major controversies connected with the United Nations. The course concludes with a look at possible reforms to the United Nations System.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL

LAW 766 National Space Legislation**Crosslisted with:** LAW 766G**Prerequisites:** LAW 748/G**Notes:** This course is available to online LL.M. students.**Description:** Discuss the various ways in which countries across the world have chosen, or are choosing, to implement relevant international requirements as well as to assert national space policies by means of such national law. A prominent place in this context will be taken by discussion of national US law on such activities as satellite communications, satellite remote sensing and space tourism.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 766G National Space Legislation****Crosslisted with:** LAW 766**Prerequisites:** LAW 748/G**Notes:** This course is available to online LL.M. students.**Description:** Discuss the various ways in which countries across the world have chosen, or are choosing, to implement relevant international requirements as well as to assert national space policies by means of such national law. A prominent place in this context will be taken by discussion of national US law on such activities as satellite communications, satellite remote sensing and space tourism.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Offered:** FALL**LAW 767 Estate Planning****Crosslisted with:** LAW 767G**Prerequisites:** LAW 637/637G; Pre- or coreq: LAW 639/639G**Description:** Federal estate and gift taxation, related income tax rules, estate planning concepts, and state inheritance taxation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 768, LAW 768G**LAW 767G Estate Planning****Crosslisted with:** LAW 767**Prerequisites:** LAW 637/637G; Pre- or coreq: LAW 639/639G**Description:** Federal estate and gift taxation, related income tax rules, estate planning concepts, and state inheritance taxation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 768, LAW 768G**LAW 768 Estate Planning Problems****Crosslisted with:** LAW 768G**Prerequisites:** LAW 767/G**Description:** Problems of planning and implementing estate plans for clients of substantial wealth with special emphasis upon skills of drafting the various legal instruments usually required for comprehensive estate planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 768G Estate Planning Problems****Crosslisted with:** LAW 768**Prerequisites:** LAW 767/G**Description:** Problems of planning and implementing estate plans for clients of substantial wealth with special emphasis upon skills of drafting the various legal instruments usually required for comprehensive estate planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 769 Tax Policy Seminar****Crosslisted with:** LAW 769G**Description:** Policies of federal income taxation with emphasis on current legislative proposals and alternatives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 769G Tax Policy Seminar****Crosslisted with:** LAW 769**Description:** Policies of federal income taxation with emphasis on current legislative proposals and alternatives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 770 Economic Justice**Crosslisted with:** LAW 770G

Notes: The readings for this discussion will be from an interdisciplinary perspective. List of topics will be narrowed during the first week of class based on the interest of the enrolled students. Frequent written briefings (1-2 pages) will be required.

Description: Examination of the relationship of legal rules to the distribution of wealth. Exploration of whether the current income and wealth *¿gap¿* differs from historical accounts about this *¿gap¿*.
 ¿ Discussion of a range of materials that present and critique the economic theory underlying various approaches to law and economics. Mock legislative hearings, simulated conferences/presentations and small group discussions on current topics in economic justice (e.g., worker supports, access to credit, access to housing, and others).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 770G Economic Justice****Crosslisted with:** LAW 770

Notes: The readings for this discussion will be from an interdisciplinary perspective. List of topics will be narrowed during the first week of class based on the interest of the enrolled students. Frequent written briefings (1-2 pages) will be required.

Description: Examination of the relationship of legal rules to the distribution of wealth. Exploration of whether the current income and wealth *¿gap¿* differs from historical accounts about this *¿gap¿*.
 ¿ Discussion of a range of materials that present and critique the economic theory underlying various approaches to law and economics. Mock legislative hearings, simulated conferences/presentations and small group discussions on current topics in economic justice (e.g., worker supports, access to credit, access to housing, and others).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 771 Gender Issues in the Law Seminar****Crosslisted with:** LAW 771G

Description: Critical review of gender role in shaping socio-legal relationships and policies. Procedural and substantive areas of the law that affect and are affected by gender. Employment, property, torts, Constitutional law, and contractual relationships. Complex relationship between gender, race and class.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 771G Gender Issues in the Law Seminar****Crosslisted with:** LAW 771

Description: Critical review of gender role in shaping socio-legal relationships and policies. Procedural and substantive areas of the law that affect and are affected by gender. Employment, property, torts, Constitutional law, and contractual relationships. Complex relationship between gender, race and class.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 772 Mental Health Law Seminar****Crosslisted with:** LAW 772G

Notes: Credit may only be earned in either LAW 763G or LAW 772G. Students who have previously taken, or are currently enrolled in, Mental Health Law (Law 763/G) may not enroll in this course.

Description: Addresses both civil and criminal issues that are likely to arise in practice. These include: civil competence for a variety of purposes; civil guardianship and conservatorship; civil commitment; confidentiality and privilege; health care provider liability in the context of mental health care; competence to proceed at several stages of the criminal process; criminal responsibility; and criminal sentencing. Critical review of the mental health laws throughout the nation and their psychological foundations. Emphasis on the research that illuminates the problems facing mental health law, system, and processes and the available solutions. Includes the insanity defense, competency to stand trial, guardianship, conservatorship, and civil commitment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 772G Mental Health Law Seminar****Crosslisted with:** LAW 772

Notes: Credit may only be earned in either LAW 763G or LAW 772G. Students who have previously taken, or are currently enrolled in, Mental Health Law (Law 763/G) may not enroll in this course.

Description: Addresses both civil and criminal issues that are likely to arise in practice. These include: civil competence for a variety of purposes; civil guardianship and conservatorship; civil commitment; confidentiality and privilege; health care provider liability in the context of mental health care; competence to proceed at several stages of the criminal process; criminal responsibility; and criminal sentencing. Critical review of the mental health laws throughout the nation and their psychological foundations. Emphasis on the research that illuminates the problems facing mental health law, system, and processes and the available solutions. Includes the insanity defense, competency to stand trial, guardianship, conservatorship, and civil commitment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL

LAW 773 Criminal Sanction Seminar**Crosslisted with:** LAW 773G**Description:** Criminal sanction with attention to conceptual and justificatory problems. Issues relating to the just administration of punishment, including the death penalty, as well as legal doctrines and defenses negating or mitigating criminal responsibility. Sentencing process considered with attention to the legal rights of offenders from conviction to final release.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 773G Criminal Sanction Seminar****Crosslisted with:** LAW 773**Description:** Criminal sanction with attention to conceptual and justificatory problems. Issues relating to the just administration of punishment, including the death penalty, as well as legal doctrines and defenses negating or mitigating criminal responsibility. Sentencing process considered with attention to the legal rights of offenders from conviction to final release.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 774 Environmental Law and Water Resource Management Seminar****Crosslisted with:** LAW 774G**Prerequisites:** Permission**Description:** An interdisciplinary seminar with the Department of Civil Engineering. Contemporary environmental issues and water resource management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 774G Environmental Law and Water Resource Management Seminar****Crosslisted with:** LAW 774**Prerequisites:** Permission**Description:** An interdisciplinary seminar with the Department of Civil Engineering. Contemporary environmental issues and water resource management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 776 Water Law Planning & Policy****Crosslisted with:** LAW 776G**Description:** Judicial, legislative and administrative problems in water resource development, allocation and control. Representative topics include: the acquisition, maintenance and transfer of private rights to use surface water and groundwater; public rights and environmental protection; interstate allocation; and federal rights and powers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 776G Water Law Planning & Policy****Crosslisted with:** LAW 776**Description:** Judicial, legislative and administrative problems in water resource development, allocation and control. Representative topics include: the acquisition, maintenance and transfer of private rights to use surface water and groundwater; public rights and environmental protection; interstate allocation; and federal rights and powers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 778 Researching Space Law****Notes:** This course is only open to LL.M. students and J.D. students who have declared space and/or telecommunications law as an area of concentrated study.**Description:** Overview of space law as well as general international law and telecommunications law (because these latter two areas of law are so integrally connected to space law) and training on how to research in these three areas of law.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL**LAW 780 Introduction to the American Legal System****Notes:** This is a non-credit course designed exclusively for students with foreign law degrees who are enrolled in the Space, Cyber, and Telecommunications LL.M. program or foreign students visiting at the Law College. It is taught in August prior to the start of classes. This course is available to online Space, Cyber and Telecommunication LLM students.**Description:** The basics of the U.S. legal system, focusing primarily on the constitutional structure and institutions of the United States, including separation of powers and federalism issues and including an introduction to the common law and case analysis.**Credit Hours:** 0**Max credits per semester:****Max credits per degree:****Format:** LEC**Offered:** FALL**LAW 781 Constitutional Problems Seminar****Crosslisted with:** LAW 781G**Description:** Selected constitutional issues of current importance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 781G Constitutional Problems Seminar****Crosslisted with:** LAW 781**Description:** Selected constitutional issues of current importance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 782 Advanced Trial Advocacy**Crosslisted with:** LAW 782G**Prerequisites:** LAW 761/G**Notes:** Enrollment limited to 12 students per semester.**Description:** Simulation exercises concerning advanced trial advocacy topics including jury selection, expert witnesses, problem witnesses, development of a trial theme and multi-party litigation. Perform simulated bench and jury trials and represent clients in mock cases selected to provide courtroom experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 782G Advanced Trial Advocacy****Crosslisted with:** LAW 782**Prerequisites:** LAW 761/G**Notes:** Enrollment limited to 12 students per semester.**Description:** Simulation exercises concerning advanced trial advocacy topics including jury selection, expert witnesses, problem witnesses, development of a trial theme and multi-party litigation. Perform simulated bench and jury trials and represent clients in mock cases selected to provide courtroom experience.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 783 Insurance Law****Crosslisted with:** LAW 783G**Description:** Focuses on the features of common insurance contracts, legislative and administrative restrictions on insurance contracts and judicial techniques for interpreting, construing and regulating insurance contracts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 783G Insurance Law****Crosslisted with:** LAW 783**Description:** Focuses on the features of common insurance contracts, legislative and administrative restrictions on insurance contracts and judicial techniques for interpreting, construing and regulating insurance contracts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 784 International Satellite Communications Law****Crosslisted with:** LAW 784G**Description:** The branch of space law which is focused most on practical and commercial applications without a doubt is the satellite communications sector. The present class will address the specific legal regimes dealing with satellite communications law in particular at the international level. Thus, it will address the role of the International Telecommunication Union (ITU) in allocating, allotting and assigning frequency spectrum and orbital slots/orbits, and the role of the World Trade Organization (WTO) in regulating the international trade in satellite communication services. Also, the unique roles of the international satellite organizations INTELSAT and INMARSAT, especially since their transition to privatized companies kicked off, will be addressed. Finally, other, more regional developments in the USA, Europe and elsewhere will be briefly touched upon.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 784G International Satellite Communications Law****Crosslisted with:** LAW 784**Description:** The branch of space law which is focused most on practical and commercial applications without a doubt is the satellite communications sector. The present class will address the specific legal regimes dealing with satellite communications law in particular at the international level. Thus, it will address the role of the International Telecommunication Union (ITU) in allocating, allotting and assigning frequency spectrum and orbital slots/orbits, and the role of the World Trade Organization (WTO) in regulating the international trade in satellite communication services. Also, the unique roles of the international satellite organizations INTELSAT and INMARSAT, especially since their transition to privatized companies kicked off, will be addressed. Finally, other, more regional developments in the USA, Europe and elsewhere will be briefly touched upon.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** FALL/SPR**LAW 785 Introduction to European Union Law****Crosslisted with:** LAW 785G**Notes:** This course is available to online LL.M. students.**Description:** Overview of the development of European Union law from the origins of the EEC, right through the latest developments such as the establishment of the European Union and the current transition from the failed Constitutional Treaty to the new Reform Treaty. The unique character of the EC/EU as a half-way house between a classical intergovernmental organization and a federal state will be explained, as well as the respective roles of the Council, the European Commission, the European Parliament and the European Court of Justice in the process of law-making - Regulations, Directives and Decisions - at the European level. Major substantive elements of EU law, such as the freedom of movement of goods, services, person and capital and the competition regime will also be briefly discussed.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 786, LAW 786G

LAW 785G Introduction to European Union Law**Crosslisted with:** LAW 785**Notes:** This course is available to online LL.M. students.

Description: Overview of the development of European Union law from the origins of the EEC, right through the latest developments such as the establishment of the European Union and the current transition from the failed Constitutional Treaty to the new Reform Treaty. The unique character of the EC/EU as a half-way house between a classical intergovernmental organization and a federal state will be explained, as well as the respective roles of the Council, the European Commission, the European Parliament and the European Court of Justice in the process of law-making - Regulations, Directives and Decisions - at the European level. Major substantive elements of EU law, such as the freedom of movement of goods, services, person and capital and the competition regime will also be briefly discussed.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**Prerequisite for:** LAW 786, LAW 786G**LAW 786 European Regulation of Space and Telecommunications****Crosslisted with:** LAW 786G**Prerequisites:** LAW 785/G**Notes:** Available to online LL.M. students.

Description: Interaction between EC/EU and the European Space Agency in the development of European space activities and policies, in regard to EUTELSAT and EUMETSAT, and their institutional integration. The development of Galileo and the Global Monitoring for Environment Security project; general legislative and regulatory competencies of commercial space and satellite communications; gradual development of an internal market for SATCOM services.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 786G European Regulation of Space and Telecommunications****Crosslisted with:** LAW 786**Prerequisites:** LAW 785/G**Notes:** Available to online LL.M. students.

Description: Interaction between EC/EU and the European Space Agency in the development of European space activities and policies, in regard to EUTELSAT and EUMETSAT, and their institutional integration. The development of Galileo and the Global Monitoring for Environment Security project; general legislative and regulatory competencies of commercial space and satellite communications; gradual development of an internal market for SATCOM services.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING**LAW 788 State and Local Government Law****Crosslisted with:** LAW 788G

Description: Law of local government units, including their relationship with state government. Topics include vertical distribution of governmental powers, theories of allocating governmental power, and recent problems in the operation and administration of local government. State constitutional law issues arise throughout our consideration of these topics.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 788G State and Local Government Law****Crosslisted with:** LAW 788

Description: Law of local government units, including their relationship with state government. Topics include vertical distribution of governmental powers, theories of allocating governmental power, and recent problems in the operation and administration of local government. State constitutional law issues arise throughout our consideration of these topics.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 789 Securities Regulation****Crosslisted with:** LAW 789G**Prerequisites:** LAW 632/G

Description: Survey of the statutes and regulations governing the distribution and trading of securities. Primary focus is on the Securities Act of 1933 and the Securities Exchange Act of 1934, with limited attention to state "blue sky" securities legislation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 789G Securities Regulation****Crosslisted with:** LAW 789**Prerequisites:** LAW 632/G

Description: Survey of the statutes and regulations governing the distribution and trading of securities. Primary focus is on the Securities Act of 1933 and the Securities Exchange Act of 1934, with limited attention to state "blue sky" securities legislation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING

LAW 790 Legal Profession**Crosslisted with:** LAW 790G**Notes:** This course meets the faculty's requirement for a course in professional responsibility.**Description:** A systematic study of the principles of professional responsibility governing the practice of law in the United States.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 658, LAW 658G**LAW 790G Legal Profession****Crosslisted with:** LAW 790**Notes:** This course meets the faculty's requirement for a course in professional responsibility.**Description:** A systematic study of the principles of professional responsibility governing the practice of law in the United States.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** LAW 658, LAW 658G**LAW 791 JSD Research****Crosslisted with:** LAW 791G**Description:** Research-focused and dissertation-based, students, working over a 2-3 year period, are required to write a book-length thesis about an aspect of space law.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 24**Format:** IND**Offered:** FALL/SPR**LAW 791G JSD Research****Crosslisted with:** LAW 791**Description:** Research-focused and dissertation-based, students, working over a 2-3 year period, are required to write a book-length thesis about an aspect of space law.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 24**Format:** IND**Offered:** FALL/SPR**LAW 792 Externship****Notes:** A student may participate in more than one externship, but the total number of credits for all externships shall not exceed three credit hours. Non-joint degree students may not take more than 12 total credit hours of Externship, Research in a Selected Field and non-law school courses.**Description:** Field placement program which may only be taken with prior approval of a sponsoring faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Offered:** ALL**LAW 793 Products Liability Seminar****Crosslisted with:** LAW 793G**Description:** Selected problems in products liability, with emphasis on research and writing projects analyzing the problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 793G Products Liability Seminar****Crosslisted with:** LAW 793**Description:** Selected problems in products liability, with emphasis on research and writing projects analyzing the problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**LAW 794 Clinical Practice - Immigration****Prerequisites:** Pre- or Co-requisite - Law 790 Legal Profession**Notes:** By faculty invitation only. Eight students per year are permitted to enroll. Students may not take Immigration Clinic and another clinic.**Description:** Represent low-income clients with immigration problems under close faculty supervision. Work in the areas of deportation defense, family-based immigrant visas, VAWA (Violence Against Women Act) self-petitions and asylum applications. Engage in the following types of activities: factual development and analysis, frequent client interviewing and counseling, preparation of immigration applications and supporting documentation, attendance with clients at immigration interviews, appearing in Immigration Court on behalf of clients, state and federal court appearances (as dictated by clients' legal needs), legal analysis and planning, frequent creation of written work product (including but not limited to legal memoranda, briefs, letters, and so forth), analysis and resolution of professional ethics issues, and other skills necessary to function effectively as lead counsel on a variety of immigration cases.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 12**Format:** CLN**Offered:** ALL**LAW 795 Thesis - LL.M****Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Format:** IND**Offered:** FALL/SPR

LAW 796 Native American Law**Crosslisted with:** LAW 796G

Description: Investigation of the federal statutory, decisional, and constitutional law that shapes the interactions of Indian tribes, the states, and the federal government. Includes an overview of the history of federal Indian policy and emphasizes the unique legal principles that inform the modern federal trust responsibility, tribal sovereignty, and complex civil and criminal jurisdictional issues that arise in Indian Country. Current topics including tribal water rights, tribal justice systems, reservation economic development, and tribal religious rights will also be addressed.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 796G Native American Law****Crosslisted with:** LAW 796

Description: Investigation of the federal statutory, decisional, and constitutional law that shapes the interactions of Indian tribes, the states, and the federal government. Includes an overview of the history of federal Indian policy and emphasizes the unique legal principles that inform the modern federal trust responsibility, tribal sovereignty, and complex civil and criminal jurisdictional issues that arise in Indian Country. Current topics including tribal water rights, tribal justice systems, reservation economic development, and tribal religious rights will also be addressed.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**LAW 797 Native American Law Seminar****Crosslisted with:** LAW 797G

Notes: Students who have previously taken Native American Law (Law 796) may not enroll in this course.

Description: Legal concepts historically used to fit Native American nations into the legal structure of the United States are examined. The legal power or jurisdiction of the federal government, the states and the tribes is explored in cases, legislation and practice.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 797G Native American Law Seminar****Crosslisted with:** LAW 797

Notes: Students who have previously taken Native American Law (Law 796) may not enroll in this course.

Description: Legal concepts historically used to fit Native American nations into the legal structure of the United States are examined. The legal power or jurisdiction of the federal government, the states and the tribes is explored in cases, legislation and practice.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**LAW 798 Clinical Practice-Civil****Crosslisted with:** LAW 798G**Prerequisites:** Pre- or Co-requisite - Law 790 Legal Profession

Notes: May be taken for 4 or 6 credits, depending on semester. Senior standing only. Preference will be given to students participating in the Litigation Skills Program of Concentrated Study.

Description: Under close faculty supervision represent clients in a variety of civil cases. Typical cases include domestic cases, bankruptcy, collection, landlord-tenant, housing, administrative appeals, conversion and replevin, adoption, name changes, and negligence.

Credit Hours: 4-6**Min credits per semester:** 4**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**Offered:** ALL**LAW 798A Clinical Practice-Civil****Prerequisites:** Paralell LAW 741G

Description: Under close faculty supervision represent clients in a variety of civil cases. Typical cases include domestic cases, bankruptcy, collection, landlord-tenant, housing, administrative appeals, conversion and replevin, adoption, name changes, and negligence.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** CLN**Offered:** SUMMER**LAW 798B Clinical Practice-Civil****Prerequisites:** Paralell LAW 741G

Description: Under close faculty supervision represent clients in a variety of civil cases. Typical cases include domestic cases, bankruptcy, collection, landlord-tenant, housing, administrative appeals, conversion and replevin, adoption, name changes, and negligence.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** CLN**Offered:** SUMMER**LAW 798G Clinical Practice-Civil****Crosslisted with:** LAW 798**Prerequisites:** Pre- or Co-requisite - Law 790 Legal Profession

Notes: May be taken for 4 or 6 credits, depending on semester. Senior standing only. Preference will be given to students participating in the Litigation Skills Program of Concentrated Study.

Description: Under close faculty supervision represent clients in a variety of civil cases. Typical cases include domestic cases, bankruptcy, collection, landlord-tenant, housing, administrative appeals, conversion and replevin, adoption, name changes, and negligence.

Credit Hours: 4-6**Min credits per semester:** 4**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**Offered:** ALL

LAW 799 Clinical Practice-Criminal**Crosslisted with:** LAW 799G**Prerequisites:** Co-requisite: Law 790/G -Legal Profession**Notes:** Cases are prosecuted through the Lancaster County Attorney's Office and the practice component is conducted out of that office.

Participation in a seminar concentrating on the development of skills necessary to the prosecution of criminal cases is required.

Description: Prosecute a variety of misdemeanor offenses under the close supervision of a faculty member.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**Offered:** ALL**LAW 799G Clinical Practice-Criminal****Crosslisted with:** LAW 799**Prerequisites:** Co-requisite: Law 790/G -Legal Profession**Notes:** Cases are prosecuted through the Lancaster County Attorney's Office and the practice component is conducted out of that office.

Participation in a seminar concentrating on the development of skills necessary to the prosecution of criminal cases is required.

Description: Prosecute a variety of misdemeanor offenses under the close supervision of a faculty member.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** CLN**Offered:** ALL

Life Sciences (LIFE)

LIFE 891 Special Topics in Life Sciences**Crosslisted with:** LIFE 491**Description:** Special topics in Life Sciences. Topical information on a designated topic, dialog and discussion of that topic, and various issues and perspectives related to that topic.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**LIFE 908 Research Practicum****Crosslisted with:** METR 908**Prerequisites:** Graduate standing.**Description:** A cohort of students from a variety of STEM disciplines will apply concepts in interdisciplinary science collaboration and communication, data analytics, and research methods. This application will occur in a real-world context as students work together to develop and carry out a research project leading to results suitable for publication in the peer-reviewed literature, or to a high-quality proposal suitable for submission to a funding agency. Students will learn about writing and reviewing proposals for funding, and about writing and reviewing manuscripts for the peer-reviewed literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Management (MNGT)

MNGT 811 Leading People and Projects**Crosslisted with:** MNGT 411**Prerequisites:** Junior standing.**Notes:** Credit toward the degree cannot be earned in both MNGT411 and MNGT465/865 Cannot be taken Pass/No Pass**Description:** Organizations are complex systems calling for a leadership processes including the leader, the follower and the context to effect change. Students should emerge with an understanding of many of the basic concepts and generalizations about leadership, which relate to human behavior and interactions in organizations. Objectives and class activities focus on understanding how leaders function in organizations and on one's leadership operations in the organizational setting.

Participants will utilize concepts, generalizations, theories and frames of reference to analyze organizations and leadership to understand and improve their functions. Topics covered include: Systems Theory and Organizational theory, the change process and the leadership process, roles in changing organizations, power and politics in organizations, congruence of individual and organizational ethics, and the behavioral concerns in project management.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 821 Initiating and Managing Entrepreneurial Growth****Crosslisted with:** ENTR 821**Prerequisites:** MNGT 321 and 360**Description:** Focuses on the management of new firms, including small businesses designed to be lifestyle ventures and firms destined to grow. Exposure to variety of growth opportunities including franchising, organic growth and expansion of smaller businesses or units within larger firms. Teaches how to manage a new business and exploit an entrepreneurial opportunity and manage resources to sustain the firm once the business is running. Learn through a variety of hands-on methods designed to enhance their critical thinking and practical business skills. Case study analysis and exposure to thought leadership in the field are part of the core learning methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 822 Managing Rapid Growth and Change in Organizations****Crosslisted with:** ENTR 822**Prerequisites:** MNGT 321 or 360**Description:** Addresses financial, human resource, operations and marketing issues that face entrepreneurs whose businesses are confronted with significant growth. In addition, will learn change management concepts that are targeted towards managing an organization in extremely turbulent times. Prepares students to work in fast-growth firms, whether they are interested in starting their own business or joining an already established fast-growth firm. Helpful for students interested in fast-growth industries such as life science and high technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MNGT 823 Business Plan Development and Decision Making**Crosslisted with:** ENTR 823**Prerequisites:** MNGT 321 or MNGT 360**Notes:** ENTR 823 may be taken by non-management majors with departmental permission.**Description:** Takes an in-depth look at the business planning process. By the end of the class, students produce their own business plans. Learn through their own business plan writing, through in-depth cases studies, by engaging in role plays and by interacting with business executives. Business plans are a critical part of any organization, thus, preparing students to develop business plans for a variety of new concepts and ideas, whether inside an established firm or as part of the start-up new venture. Students will be asked to enter their business plans into the business planning competitions in which the University participates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 828 Leadership in a Global Context****Prerequisites:** MNGT 311 or MNGT 360; or permission.**Notes:** Credit towards the degree cannot be earned in both MNGT 414 and 828.**Description:** Taught from the perspective of US enterprises operating in the global economy. The manner in which cultural, economic, political, and social differences affect the management of business, governmental, military, and other enterprises is considered. Emphasis on problems of managing in Latin America, Europe, and Asia.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 850 Management Information Systems****Description:** Education or experience with computers and/or experience in administration. Consideration of kinds of information needed to support the full spectrum of decision making in private and public organizations. Techniques of measuring and reporting on outcomes of managerial decisions. The design of management information systems (MIS) with regard to the proper role of the computer, systems analysts, programmers, managers and users, data management technology, and kinds of computer hardware and software.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 851 Strengths Coaching, Theory and Practice****Crosslisted with:** MNGT 451**Prerequisites:** Accepted as a Student Strengths Coach.**Description:** Provides in-depth knowledge of strengths-based development and techniques to maximize the individual potential of others through the exploration and application of CliftonStrengths. Develops skills to be successful in coaching and positively impacting student development, engagement, and well-being in college and after graduation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**MNGT 862 Labor Relations****Crosslisted with:** MNGT 462**Prerequisites:** Junior standing; MNGT 360 or ECON 381.**Description:** Interdisciplinary approach to labor-management relations with emphasis on collective bargaining and grievance administration. Appreciation of collective bargaining process gained through actual negotiating of a labor-management contract. On-going union-management relationships explored.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 863 Compensation Administration****Prerequisites:** MNGT 360 and 361**Description:** Design and administration of compensation systems. Deals with determinants of general level of pay, pay structures, wage and salary surveys, job analysis, job evaluation, performance evaluation, benefit plans, and financial incentive systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 864 Talent Acquisition and Staffing****Prerequisites:** MNGT 360 and 361**Description:** This course will explain the process by which organizations forecast employment needs, recruit potential employees, select high potential candidates from applicant pools, assess job performance levels, give feedback, train and develop existing employees, and deal with voluntary and involuntary turnover. Students will be provided with examples of tools used by HR professionals in the staffing process. Students will also be expected to evaluate and suggest improvements to real HR recruiting and selection systems based on the information learned in the classroom.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 866 The Regulatory Environment for Employment and Labor****Crosslisted with:** ECON 485, MNGT 466, ECON 885**Prerequisites:** Junior Standing; MNGT 360 and 361 (departmental permission is required if MNGT 360 and/or MNGT 361 have not been completed).**Description:** Government regulation of employment and labor relations. Includes laws and agencies relating to employment practices, pay, hours, equal employment opportunity, labor relations, safety, health, pensions, and benefits. Social and economic implications of governmental regulation considered.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Labor Economics

MNGT 871 Nonprofit Management

Description: Provide an overview of the management skills required by leaders of nonprofit organizations. Discuss the purpose or mission of a nonprofit organization and its place in society. Examine the importance of an organizational vision of success, and how that can lead to a well-developed strategic plan.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

MNGT 875 Business Policies and Strategies

Crosslisted with: MNGT 475

Prerequisites: Open only to students in the College of Business Administration. ACCT201 and ACCT202; ECON211 and ECON212; FINA361; SCMA350 and SCMA331; MNGT301; MRKT341; or equivalent.

Notes: Seniors graduating at the end of the current term will have first priority. Non-priority students may be dropped. Cannot be taken Pass/No Pass.

Description: Formulation and application of business policies and strategies; analysis of cases using knowledge acquired in basic courses in accounting, economics, finance, human resources, information systems, marketing, and operations. The "C" complexity of business problems and the interrelationship of business functions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

MNGT 905 Research Design and Methodology

Prerequisites: Permission

Description: Research designs appropriate for basic and field research, including methodology for implementing such designs. An analysis of various statistical methods for evaluating research data. Includes prospectus and manuscript writing and submission; critical review of various research currently published.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 932 Business History

Description: History of business of the leading nations with emphasis on the United States, including the effect of environment upon business, the development of entrepreneurship and management, and the impact of business upon the community and nation. Case histories and entrepreneurial-managerial appraisals.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 941 Management Science

Prerequisites: Graduate students who have completed all quantitative core requirements equivalent to MATH 104 or 105; ECON 215; and MNGT 331

Description: Main concepts and techniques of modern management science for management decision analysis. Application of the tools to real-world decision-making situations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 954 Advanced Topics in Information Systems

Prerequisites: Permission

Description: Identifies and addresses the current issues in Information Systems. Includes technical and managerial aspects, e.g., Internet, software project management, etc.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 960 Organizational Behavior

Prerequisites: Permission

Description: Human behavior within organizations. Research findings and the contributions of behavioral science.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 969 Organization and Management Theory

Prerequisites: Permission

Description: Major historical perspectives and some of the current competing paradigms in the field of organization theory. Classical management theory, human relations theory, the technology-structure and structure-environment contingency perspectives for organizational design, strategic human resource management, organizational culture, institutional theory, and such current topics as organizational demography and groups in organizations. Critiquing the theoretical perspectives on both conceptual and methodological dimensions as well as developing comparisons and contrasts between the perspectives. Critical elements of theory building in the organizational sciences and the frameworks for examining organizational theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 971 Strategic Leadership

Prerequisites: Permission

Description: The effect of leadership throughout organizations on successful development and execution of organizational strategies. Strategic leadership in organizations and its relationship to domains such as top management teams, board leadership development, organizational visions and cultures, and organizational effectiveness. Relevance of strategic leadership theory and practice to organizational change and/or transformation, strategic alignment, organizational adaptability, global organizational systems, and authentic organizational decision-making and cultures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MNGT 980 Seminar in Interpersonal Processes in Organizations**Prerequisites:** Permission

Description: Field of organizational behavior at the individual level. Two specific features of human behavior: understanding how individuals interact with their environment to explain behavior and performance; and how individuals interact with other actors in their work environment to both facilitate and evaluate attitudes and behavior. Students read existing research literature to learn the "classic" studies that serve as the foundations for significant organizational behavior theories, and to understand the current conceptual trends, hypotheses, and methodologies involved in advancing these theories.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 981 Seminar in Labor Relations****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 982 Seminar in Human Resource Management****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 983 Seminar in Organizational Behavior****Prerequisites:** Permission

Description: Capstone seminar in the organizational behavior track. Reflection, perspective and the future of topics in the field of organizational behavior including research methodology, social learning theory/organizational behavior models, managerial activities/behaviors, cross-cultural/international research, and leadership.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 984 Seminar in Operations Management****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 985 Seminar in Strategic Management and Business Policy****Prerequisites:** MNGT 876 and GRBA 853, or equivalent**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 988 Seminar in Management Information Systems****Prerequisites:** MNGT 950 or equivalent**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 989 Seminar in Organization and Management Theory****Prerequisites:** Permission

Description: Current paradigms in the field of organizational theory. Transaction cost economics, agency theory, strategic choice and decision-making, resource dependency, power, population and community ecologies, and interorganizational networks. Current topics in organizational theory. Critiquing the theoretical perspectives on both conceptual and methodological dimensions as well as developing comparisons and contrasts between the perspectives. Ethical code of conduct and other issues involved in publishing in the organizational sciences.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 990 Seminar in History of Management Thought**

Description: Development of management thought from the ancient civilizations of Sumer and Egypt, through the Middle Ages, to more recent developments. Scientific Management School, the contributions of Henri Fayol, and the Hawthorne research. The evolution of management as a body of knowledge.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MNGT 994 Seminar in Selected Topics I****Prerequisites:** Management department permission**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**MNGT 995 Seminar in Selected Topics II****Prerequisites:** Management department permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**MNGT 996 Directed Reading or Research****Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Format:** IND**MNGT 999 Doctoral Dissertation**

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Marketing (MRKT)

MRKT 821 Applied Marketing Research

Prerequisites: GRBA 813 or equivalent; EDPS 859 or ECON 215 or equivalent

Description: Research methods to supply marketing information pertaining to the: assessment of the nature of demand, assessment of the extent of demand, marketing program development, and the monitoring of marketing performance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 822 Survey of Buyer Behavior

Prerequisites: GRBA 813 or equivalent

Description: Survey of the literature of buyer behavior. Economic, sociocultural and psychological aspects of buying behavior as the basis of marketing strategy and public policy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MRKT 972

MRKT 824 Advanced Quantitative Analysis in Marketing

Crosslisted with: SRAM 824

Prerequisites: GRBA 813 or equivalent

Description: Review, evaluation, and design of advanced marketing research investigations. State-of-the-art methodological issues relevant to marketing to provide an understanding of multivariate data analysis pertinent to the marketing literature. Analysis of linkage, structure, and causality/change for marketing phenomena.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 826 Services Marketing

Crosslisted with: MRKT 426

Prerequisites: MRKT 341

Description: Services marketing and the services marketing process. Key concepts, issues and terminology. Specific tools and frameworks enabling communication with other professional marketers and analysis of services marketing situations to make realistic recommendations for managerial action.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 828 Sports Marketing

Prerequisites: GRBA 813 or equivalent.

Description: Basic concepts and theories unique to sports marketing, review of the basic principles of marketing in the context of sports. Framework provided for incorporation of unpredictable nature of the sports industry and exploration of the complex relationships between the elements of sports and marketing. Current research in the area of sports marketing, coverage of the growing popularity of women's sports, and the globalization of sports.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MRKT 896

MRKT 830 Strategic Issues in Marketing Communication

Prerequisites: GRBA 813 or equivalent

Description: Analysis and application of current concepts regarding the formulation and evaluation of marketing communication strategy in organizations which operate on a profit and not-for-profit basis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 835 Marketing Channels and Distribution

Prerequisites: GRBA 813 or equivalent

Description: Marketing management issues related to selection of intermediaries, channel control, marketing institutions, channel power and pricing. Distribution management issues: location, finished goods inventory, transportation, communication, and customer service.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 841 Digital Marketing and Electronic Commerce

Crosslisted with: MRKT 441

Prerequisites: MRKT 341; MRKT 350 or MNGT/MIST 350.

Description: Strategies to deal with opportunities and challenges of evolving technology and marketing in digital networks of customers, suppliers, and employees; social and mobile marketing; different interactive marketing platforms for e-commerce; the future and strategic, societal, and ethical implications of technology and interactive marketing in e-commerce.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 845 Advanced Marketing Analytics

Prerequisites: GRBA 851

Description: Web, social media, and consumer text analytics; analyzing consumer data streams from the Internet, mobile devices, and sensors; handling very large volumes of data; general data analysis software operation for various marketing problems; marketing platform software for general and specific tasks; learning machines in marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 850 Data Driven Marketing Strategy

Prerequisites: GRBA 851 or one or more graduate or undergraduate statistics classes that cover basic statistics through least-squares regression.

Description: Theory and strategic use of large marketing databases. Translating market data into insights for decisions like pricing, advertising response, resource allocation, and new product forecasting. Topics covered include market response models, linear models, clustering and classification, conjoint analysis techniques, resource allocation models, forecasting models, customer profitability analysis, customer choice modeling, value pricing, product line decisions and other significant strategic marketing issues facing today's managers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 855 Marketing and Globalization

Crosslisted with: ABUS 855

Prerequisites: GRBA 813 or equivalent

Description: Globalization and resulting changes in the business environment. Access to new consumers, new supplies. The effect on consumer choices. Readings from scholarly and popular press, videos, and a "real world" application. Marketing strategies developed for Nebraska firms and organizations such as value-added food marketers.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

MRKT 896 Sports Marketing Practicum

Prerequisites: MRKT 828 and permission

Description: Supervised sports marketing related internship.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

MRKT 898 Seminar: Special Topics

Prerequisites: GRBA 813 or equivalent

Description: Current topics in marketing; services marketing, ethics, and business-to-business marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

MRKT 921 Seminar in Marketing Communication Strategy

Prerequisites: Permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921A Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921B Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921D Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921E Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921G Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 921J Seminar in Marketing Communication Strategy

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931 Marketing Channels Topical Seminar

Prerequisites: Permission.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931A Marketing Channels Topical Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931B Marketing Channels Topical Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931D Marketing Channels Topical Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931E Marketing Channels Topical Seminar

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 931G Marketing Channels Topical Seminar**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 931J Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 940 Marketing Management****Prerequisites:** Permission.**Description:** Decision-making activities in problems concerned with the development and management of marketing programs. Strategy choices in situations involving product development, market analysis and segmentation, channels, merchandising, promotion, pricing, and marketing research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 944 Theory of Logistics****Prerequisites:** Permission.**Description:** Critical examination of various theories of structure and operation of logistics systems. Application of logistics theory to business problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 945 Qualitative Research Methods in Business Seminar****Prerequisites:** Permission.**Description:** Developing qualitative research skills, analyzing theory development and research process. Research design, data collection, qualitative data analysis and interpretation, theory-development, and evaluation of qualitative research. Latest development in qualitative research in business and social science disciplines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 954 Problems in International Marketing****Prerequisites:** Permission.**Description:** Simulation of marketing decision making in an international environment. Material in the course is balanced between the developed and underdeveloped countries of the world in Europe, Africa, Asia, and the Americas. Case materials are used as a basis for class discussion. Cases and discussions focus on specific interests of students enrolled.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 970 Development of Marketing Theory****Prerequisites:** Permission.**Description:** Continuing development of marketing theory, utilizing a review of "classic" and current marketing literature. Historical roots of marketing as a discipline, the requirements for marketing theory, and current efforts and future directions in the development of a mid-range theory of marketing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 971 Marketing and Society****Prerequisites:** Permission.**Description:** Role of the marketing activities and the marketing system in society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 972 Seminar: Behavioral Research in Marketing****Prerequisites:** MRKT 822, and permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 980 Marketing Colloquium****Prerequisites:** Permission**Description:** Seminar in dissertation research topics and methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MRKT 996 Directed Reading or Research****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Format:** IND**MRKT 998 Seminar in Special Topics****Prerequisites:** Permission**Notes:** New topics announced prior to each term in which course is offered.**Description:** Current topics in marketing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 18**Format:** LEC**MRKT 998A Seminar in Special Topics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MRKT 998B Seminar in Special Topics

Description: New topics announced prior to each term in which course is offered. Seminar in current topics in marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 998D Seminar in Special Topics

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 998E Seminar in Special Topics

Description: New topics announced prior to each term in which course is offered. Seminar in current topics in marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 998J Seminar in Special Topics

Description: New topics announced prior to each term in which course is offered. Seminar in current topics in marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 998K Seminar in Special Topics

Description: New topics announced prior to each term in which course is offered. Seminar in current topics in marketing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MRKT 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Materials Engineering (MATL)

MATL 860 Mechanical Aspects of Materials

Crosslisted with: MATL 460

Prerequisites: MECH 325 and MATL 360, or equivalent.

Description: Emphasizes those principles at the atomistic or molecular level that relate mechanical properties and behavior of different classes of materials to their structure and environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 861 Materials Laboratory II

Crosslisted with: MATL 461

Prerequisites: MATL 360.

Description: Application of scientific principles in the laboratory to the analysis of materials problems and selection of engineering materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LAB

MATL 862 X-ray Diffraction

Crosslisted with: MATL 462

Prerequisites: PHYS 212.

Description: Principles of crystallography. Production and properties of X-rays. Interaction of X-rays with atoms and the nature of diffraction (direction and the intensities of diffracted beams). Diffraction patterns and intensity measurements.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 864 Thin Films and Surface Engineering

Prerequisites: Graduate standing in engineering, physics, chemistry, or permission

Description: Thin films play an important role in a myriad of applications ranging from magnetic recording media, architectural glass panels, and microelectronics to coatings for reduction of wear and corrosion in components on board the space shuttle. Includes: vacuum science and technology; pumping systems and instrumentation; thin film deposition techniques; surface modification techniques; characterization of thin film properties; microstructural, physical and mechanical properties; and comparisons of surface enhancement techniques in terms of suitability, performance, and cost.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 865 Applied Physical Metallurgy and Design

Crosslisted with: MATL 465

Prerequisites: MATL 360 or equivalent.

Description: Principles of alloying; alloy selection; modification of the physical properties of structural alloys by thermal, mechanical, and chemical treatment; solidification and joining phenomena.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 866 Materials Selection for Mechanical Design

Crosslisted with: MATL 466

Prerequisites: MATL 360 and MECH 325; or permission.

Description: Rational selection procedure for the most suitable materials for each particular mechanical design. Introduction of materials selection charts and the concept of materials performance indices. Case studies in mechanical design, taking materials selections, shape and process into account. Projects on materials selection at the design concept and the design embodiment stages.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 867 Principles of Powder Metallurgy**Crosslisted with:** MATL 467**Prerequisites:** MECH 200; MECH 325; MATL 360 or equivalent.**Description:** Basic principles of powder metallurgy, with emphasis on methods of producing metal powders, determination of their characteristics; the mechanics of powder compaction; sintering methods and effects; and engineering applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 868 Failure Analysis: Prevention and Control****Crosslisted with:** MATL 468**Prerequisites:** MECH 325; MATL 360 or equivalent.**Description:** Metallurgical tools for analysis of failures; types and modes of failures; sources of design and manufacturing defects. Case histories utilized to illustrate modes of failures and principles and practices for analysis. Design concepts and remedial design emphasized with these case studies. Several projects involving case analyses and design by students included.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 869 Physical Materials Systems****Crosslisted with:** MATL 469**Prerequisites:** PHYS 212 and MATL 360.**Description:** Development of the principles controlling the formation of the structure of engineering materials. Phase diagrams, diffusion, interfaces and microstructures, solidification and diffusional transformation and diffusionless transformations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 870 Thermodynamics of Alloys****Crosslisted with:** MATL 470**Prerequisites:** MATL 360 and MECH 200, or equivalent; MATH 208 or parallel.**Description:** Materials thermodynamics of closed systems, introduction to liquid and solid solution alloys, relationship to gas phase, application to binary systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 871 Electron Microscopy of Materials****Crosslisted with:** MATL 471**Prerequisites:** PHYS 212.**Description:** Introduction to electron beam instruments. Electron interactions with materials. Basic aspects of electron diffraction, image formation and spectrum generation by materials. Acquisition and analysis of images, diffraction patterns and spectral data. Resolution and sensitivity limits of electron probe methods. Practical experience in the use of electron microscopes for characterization of materials.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 872 Kinetics of Alloys****Crosslisted with:** MATL 472**Prerequisites:** MATL 360 or equivalent; MATH 221/MATH 821.**Description:** Kinetics of gas-liquid-solid reactions in alloy systems; analysis of diffusion models applicable to such systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 873 Corrosion****Crosslisted with:** MATL 473**Prerequisites:** CHEM 109 or equivalent.**Description:** Fundamentals of corrosion engineering, underlying principles, corrosion control, and materials selection and environmental control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 874 Extractive Metallurgy****Crosslisted with:** MATL 474**Prerequisites:** MATL 360 and MECH 200 or equivalent.**Description:** Unit operations and processes utilized in production of ferrous, nonferrous, and refractory metals. Examples of production techniques for metal bearing ores, scrap metals, and domestic waste. Control of impurity and alloy content and their relationship to physical properties.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 875 Glass and Ceramic Materials****Prerequisites:** MATL 860 and 870, or permission**Description:** Principles underlying the processing and microstructure evolution in nonmetallic materials, particularly glasses and ceramics. Structure-property relations in ceramics for engineering applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 877 Organic and Inorganic Electronic Materials and Devices****Crosslisted with:** MATL 477**Prerequisites:** Permission.**Description:** The course introduces the optical and electronic processes in inorganic and organic molecules and polymers that govern the behavior of practical organic electronic and optoelectronic devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATL 898 Laboratory and Analytical Investigation****Crosslisted with:** MATL 498**Description:** Investigation and written report of research into specific problems in any major area of materials engineering.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LAB

MATL 960 Materials Aspects of Fracture

Prerequisites: MATL 860; MATL 870

Description: Utilization of certain aspects of applied elasticity, plasticity, and materials physics to explain the relationship between materials structures and mechanical properties. Includes review of various types of material failure and mechanical tests employed to predict behavior of materials with emphasis on metals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 962 Imperfections in Crystals

Prerequisites: CHEM 882; MATL 860

Description: Fundamental properties of defects in solids. Energy considerations for point, line, and plane defects. Equilibrium and nonequilibrium concentrations of defects and annealing theory. Mutual interactions of defects and formation of secondary defects. Interaction of defects with other perturbations of the crystal lattices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 970 Advanced Thermodynamics of Materials

Prerequisites: MATL 870, MATH 821 or equivalent

Description: Applications of thermodynamic concepts to phase equilibria in materials systems. Systematics of solution theories and lattice modeling. Experimental methods; computer modeling in materials thermodynamics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 972 Transformation in Materials

Prerequisites: CHEM 882; MATL 870

Description: Classical nucleation theory, homogeneous and heterogeneous nucleation. Precipitation studies in solids including transition precipitates. Kinetics of growth of precipitates. Diffusion controlled transformation process.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATL 997 Research Other Than Thesis

Prerequisites: Advanced graduate standing and permission

Description: Supervised non-thesis research and independent study.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 24

Format: IND

MATL 998 Advanced Materials Topics

Prerequisites: Permission

Description: Course offered as the need arises to teach advanced topics in materials characterization, processing, synthesis or properties not covered in other 900-level courses.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

Mathematics (MATH)

MATH 800P Number and Operation for K-3 Mathematics Specialists

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Description: Number and operations. Place value and its role in arithmetic operations. Development of fractions and number systems. Develop the habits of mind of a mathematical thinker and to develop a depth of understanding of number and operations sufficient to enable the teacher to be a disciplinary resource for other K-3 teachers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 800T Mathematics as a Second Language

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Notes: MATH 800T is intended for mid-level mathematics teachers.

Description: Numbers and operations. Careful reasoning, problem solving, and communicating mathematics both orally and in writing. Connections with other areas of mathematics. Development of mathematical thinking habits.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 801P Geometry, Measurement, and Algebraic Thinking for K-3 Mathematics Specialists

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences.

Description: Polygons, polyhedra, rigid motions, symmetry, congruence, similarity, measurement in one, two and three dimensions, functions, mathematical expressions, solving equations, sequences. Develop the habits of mind of a mathematical thinker and to develop a depth of understanding of geometry, measurement and algebraic thinking to enable the teacher to be a disciplinary resource for other K-3 teachers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 802P Number, Geometry and Algebraic Thinking II for K-3 Math Specialists

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Notes: MATH 802P will not count toward the MA or MS degree in mathematics or statistics.

Description: Number sense and operations in the context of rational numbers, geometry and algebra in grades 4-6 curriculum, and how the mathematical content in grades K-3 (e.g., Taylor-Cox, 2003) lays a foundation for abstract thinking beginning in grades 4 and beyond. Designed to develop a depth of understanding sufficient to enable the teacher to be a disciplinary resource to other K-3 teachers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 802T Functions, Algebra, and Geometry for Middle Level Teachers

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Description: Variables and functions. Use of functions in problem solving. Theory of measurement, especially length, area, and volume. Geometric modeling in algebra. Graphs, inverse functions, linear and quadratic functions, the fundamental theorem of arithmetic, modular arithmetic, congruence and similarity. Ways these concepts develop across the middle level curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 803P Algebraic Thinking in the Elementary Classroom

Prerequisites: A valid elementary or early childhood teaching certificate.

Notes: Not open to MA or MS students in mathematics or statistics.

Description: Course explores the mathematics supporting algebraic thinking in elementary mathematics. Develops a deeper understanding of algebraic properties and greater flexibility in mathematical reasoning. Case studies, video segments, and student work samples will be examined. Complex mathematical problems will be worked with connections made between participants' thinking and that of their students.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 804P Problem Solving and Critical Thinking in the Elementary Classroom

Prerequisites: A valid elementary or early childhood teaching certificate.

Notes: Not open to MA or MS students in mathematics or statistics.

Description: Course uses problem-solving experiences to develop teachers' critical-thinking skills in order to build a strong foundation for teaching and communicating mathematical concepts. Provides a guided opportunity for the implementation of problem-solving instruction is aligned with the Mathematics Standards in both the primary (K-2) and intermediate (3-5) elementary classroom.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 804T Experimentation, Conjecture and Reasoning

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Notes: MATH 804T is intended for middle-level mathematics teachers.

Description: Problem solving, reasoning and proof, and communicating mathematics. Development of problem solving skills through the extensive resources of the American Mathematics Competitions. Concepts of logical reasoning in the context of geometry, number patterns, probability and statistics

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 805T Discrete Mathematics for Middle Level Teachers

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences.

Notes: MATH 805T is intended for mid-level mathematics teachers.

Description: Concepts of discrete mathematics, as opposed to continuous mathematics, which extend in directions beyond, but related to, topics covered in middle-level curricula. Problems which build upon middle-level mathematics experiences. Logic, mathematical reasoning, induction, recursion, combinatorics, matrices, and graph theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 806T Number Theory and Cryptology for Middle Level Teachers

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences

Notes: MATH 806T is intended for mid-level mathematics teachers.

Description: Basic number theory results and the RSA cryptography algorithm. Primes, properties of congruences, divisibility tests, linear Diophantine equations, linear congruences, the Chinese Remainder Theorem, Wilson's Theorem, Fermat's Little Theorem, Euler's Theorem, and Euler's phi-function. Mathematical reasoning and integers' connections to the middle school curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 807 Mathematics for High School Teachers I

Prerequisites: MATH 208 and 310.

Notes: Not open to graduate students in mathematics.

Description: Analysis of the connections between college mathematics and high school algebra and precalculus.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 807T Using Mathematics to Understand Our World

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences.

Notes: MATH 807T is intended for middle-level mathematics teachers.

Description: The mathematics underlying several socially-relevant questions from a variety of academic disciplines. Construct mathematical models of the problems and study them using concepts developed from algebra, linear and exponential functions, statistics and probability. Original documentation, such as government data, reports and research papers, in order to provide a sense of the role mathematics plays in society, both past and present.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 808 Mathematics for High School Teachers II

Prerequisites: MATH 310 and 350.

Notes: Not open to graduate students in mathematics.

Description: Analysis of the connections between college mathematics and high school algebra and geometry.

Credit Hours: 0

Max credits per semester:

Max credits per degree:

Format: LEC

MATH 808T Concepts of Calculus for Middle Level Teachers

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences.

Notes: MATH 808T is intended for middle-level mathematics teachers.

Description: The processes of differentiation and integration, their applications and the relationship between the two processes. Rates of change, slopes of tangent lines, limits, derivatives, extrema, derivatives of products and quotients, anti-derivatives, areas, integrals, and the Fundamental Theorem of Calculus. Connections to concepts in the middle level curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 809 Math for High School Teachers II, Using Math to Understand Our World

Crosslisted with: MATH 409

Prerequisites: Math 310, Math 314, Math 380/Stat 380

Notes: Not open to MA or MS students in Mathematics. This course is for students seeking a mathematics major under the Education Option and for students in CEHS who are seeking their secondary mathematics teaching certificate.

Description: Designed around a series of projects in which students create mathematical models to examine the mathematics underlying several socially-relevant questions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 810T Algebra for Algebra Teachers

Prerequisites: Admission to the MAT or MScT program in mathematics or to a graduate program in the College of Education and Human Sciences.

Description: The integers. The Euclidean algorithm, the Fundamental Theorem of Arithmetics, and the integers mod n . Polynomials with coefficients in a field. The division algorithm, the Euclidean algorithm, the unique factorization theorem, and its applications. Polynomials whose coefficients are rational, real or complex. Polynomial interpolation. The habits of mind of a mathematical thinker. The conceptual underpinnings of school algebra.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 811T Functions for High School Teachers

Prerequisites: A valid secondary mathematics teaching certificate or by permission

Description: Course examines mathematics underlying pre-calculus material through problem solving. Connections to other topics in mathematics, including algebra, geometry and advanced mathematics are highlighted.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 812T Geometry for Geometry Teachers

Prerequisites: A valid secondary mathematics teaching certificate

Description: Course examines mathematics underlying high school geometry through problem solving. Topics include Spherical, Euclidean and Hyperbolic geometry, introduction to Neutral geometry, Platonic and Archimedean solids and projective geometry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 814 Linear Algebra

Crosslisted with: MATH 314

Prerequisites: A grade of P, C, or better in MATH 208 or MATH 208H

Notes: Not open to MA or MS students in mathematics or statistics

Description: Fundamental concepts of linear algebra, including properties of matrix arithmetic, systems of linearequations, vector spaces, inner products, determinants, eigenvalues and eigenvectors, and diagonalization.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 970; CSCE 973; MATH 405; MATH 435; MATH 442; MATH 456; MATH 471; MATH 809, MATH 409; MECH 350; MECH 888; STAT 970

Groups: Advanced Mathematics Courses

MATH 814T Linear Algebra for Teachers

Prerequisites: A valid secondary mathematics teaching certificate or by permission.

Description: Emphasis on connections between linear equations, linear transformations and the geometry of lines and planes. Applications to production planning, encryption methods, and analyzing data.

Topics include methods of solving linear systems with an emphasis on solution behavior, along with behaviors exhibited by explicit linear transformations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 815 Theory of Linear Transformations

Crosslisted with: MATH 415

Prerequisites: MATH 314/814 and either MATH 325 or MATH 310.

Description: Topics fundamental to the study of linear transformations on finite and infinite dimensional vector spaces over the real and complex number fields including: subspaces, direct sums, quotient spaces, dual spaces, matrix of a transformation, adjoint map, invariant subspaces, triangularization and diagonalization. Additional topics may include: Riesz Representation theorem, projections, normal operators, spectral theorem, polar decomposition, singular value decomposition, determinant as an n-linear functional, Cayley-Hamilton theorem, nilpotent operators, and Jordan canonical form.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 816T Math in the City for Teachers

Prerequisites: An undergraduate course in at least one of statistics, differential equations or matrix algebra; a valid secondary mathematics teaching certificate

Description: A modeling course run in collaboration with area businesses or organizations in which real world problems are studied. Course emphasizes how mathematics is used outside academia.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 817 Introduction to Modern Algebra I

Prerequisites: MATH 417

Description: Topics from elementary group theory and ring theory, including fundamental isomorphism theorems, ideals, quotient rings, domains. Euclidean or principal ideal rings, unique factorization, modules and vector spaces including direct sum decompositions, bases, and dual spaces.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CSCE 977

MATH 818 Introduction to Modern Algebra II

Prerequisites: MATH 817

Description: Topics from field theory including Galois theory and finite fields and from linear transformations including characteristic roots, matrices, canonical forms, trace and transpose, and determinants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 820 Elementary Analysis for the Sciences

Prerequisites: Math 208 and evidence of adequate preparation

Notes: Students in the sciences and Statistics cannot count MATH 820 toward a minor in Mathematics. A term paper and/or project is required for graduate credit. Not open to graduate students in Mathematics.

Description: A mathematical introduction to elementary analysis (the calculus). Specifically, it is a demanding course that introduces concepts in abstraction: the axiomatic method, proofs, and mathematical thinking and writing in the context of elementary real analysis, or the theory underlying calculus. Specific topics include: logic, sets, functions; the real number system (field and order axioms, completeness axiom); mathematical induction; limits of sequences and functions, convergence, and continuity; the derivative and Riemann integral.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: CHME 815; CHME 825; MECH 881

MATH 821 Differential Equations

Crosslisted with: MATH 221

Prerequisites: A grade of P, C, or better in MATH 208 or MATH 208H

Notes: Not open to MA or MS students in mathematics or statistics.

Description: First- and second-order methods for ordinary differential equations including: separable, linear, Laplace transforms, linear systems, and some applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGEN 303, BSEN 303; AGEN 344, BSEN 344; AGEN 350, BSEN 350; AGEN 957, BSEN 957, CIVE 957, GEOL 957; BSEN 260, AGEN 260; BSEN 311; BSEN 317; BSEN 326, CIVE 326; BSEN 326H, CIVE 326H; BSEN 943; BSEN 954, NRES 954; CHME 312; CHME 815; CHME 825; CHME 835; CIVE 310; CIVE 310H; ECEN 213; ECEN 216; ECEN 304; ECEN 306; ECEN 328; IMSE 328; MATH 430; MATH 435; MATH 442; MATH 456; MECH 310, MECH 310H; MECH 318; MECH 330; MECH 381; MECH 480, MECH 880; MECH 881; MECH 925; MECH 933; MECH 936; MECH 938; METR 312; PHYS 311; PHYS 422, PHYS 822, ECEN 422, ECEN 822

Groups: Advanced Mathematics Courses

MATH 822 Advanced Calculus**Crosslisted with:** MATH 322**Description:** Uniform convergence of sequences and series of functions, Green's theorem, Stoke's theorem, divergence theorem, line integrals, implicit and inverse function theorems, and general coordinate transformations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MATH 456; MECH 812; METR 965**Groups:** Advanced Mathematics Courses**MATH 823 Complex Analysis****Crosslisted with:** MATH 423**Prerequisites:** A grade of P, C, or better in MATH 208 or MATH 208H**Description:** Complex numbers, functions of complex variables, analytic functions, complex integration, Cauchy's integral formulas, Taylor and Laurent series, calculus of residues and contour integration, conformal mappings, harmonic functions. Applications of these concepts in engineering, physical sciences, and mathematics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 824 Introduction to Partial Differential Equations****Crosslisted with:** MATH 424**Prerequisites:** A grade of P, C, or better in MATH 221 or MATH 221H**Notes:** Not open to MA or MS students in mathematics or statistics.**Description:** Derivation of the heat, wave, and potential equations; separation of variables method of solution; solutions of boundary value problems by use of Fourier series, Fourier transforms, eigenfunction expansions with emphasis on the Bessel and Legendre functions; interpretations of solutions in various physical settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MECH 812**Groups:** Advanced Mathematics Courses**MATH 825 Mathematical Analysis I****Prerequisites:** MATH 325**Description:** Real number system, topology of Euclidean space and metric spaces, continuous functions, derivatives and the mean value theorem, the Riemann and Riemann-Stieltjes integral, convergence, the uniformity concept, implicit functions, line and surface integrals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 826 Mathematical Analysis II****Prerequisites:** MATH 825**Description:** Real number system, topology of Euclidean space and metric spaces, continuous functions, derivatives and the mean value theorem, the Riemann and Riemann-Stieltjes integral, convergence, the uniformity concept, implicit functions, line and surface integrals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 827 Mathematical Methods in the Physical Sciences****Crosslisted with:** MATH 427**Prerequisites:** A grade of P, C, or better in MATH 221 or MATH 221H**Notes:** Not open to mathematics majors. Not open to MA or MS students in mathematics.**Description:** Matrix operations, transformations, inverses, orthogonal matrices, rotations in space. Eigenvalues and eigenvectors, diagonalization, applications of diagonalization. Curvilinear coordinate systems, differential operations in curvilinear coordinate systems, Jacobians, changes of variables in multiple integration. Scalar, vector and tensor fields, tensor operations, applications or tensors. Complex function theory, integration by residues, conformal mappings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 828 Principles of Operations Research****Crosslisted with:** MATH 428**Prerequisites:** MATH 314; STAT 380 or MECH 321.**Description:** Introduction to techniques and applications of operations research. Includes linear programming, queueing theory, decision analysis, network analysis, and simulation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 830 Differential Equations I****Prerequisites:** MATH 325**Description:** Phase diagrams, bifurcation theory, linear systems, the matrix exponential function, Floquet theory, stability theory, existence (Poincare-Bendixson Theorem) and non-existence of periodic solutions for non-linear ordinary differential equations, self-adjoint equations, and Sturm-Liouville theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 831 Differential Equations II****Prerequisites:** MATH 830**Description:** Vector calculus, transport equations, Laplace's equation, the heat equation, the wave equation, maximum principles, mean-value formulae, finite speed of propagation, energy methods, solution representations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 832 Linear Optimization****Crosslisted with:** MATH 432**Prerequisites:** MATH 314 or 314H; MATH 310 or 310H or MATH 325**Description:** Mathematical theory of linear optimization, convex sets, simplex algorithm, duality, multiple objective linear programs, formulation of mathematical models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses

MATH 833 Nonlinear Optimization**Crosslisted with:** MATH 433**Prerequisites:** MATH 314/814 and MATH 310 or MATH 325.**Description:** Mathematical theory of unconstrained and constrained optimization for nonlinear multivariate functions, particularly iterative methods, such as quasi-Newton methods, least squares optimization, and convex programming. Computer implementation of these methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 839 Mathematical Models in Biology****Crosslisted with:** MATH 439**Prerequisites:** A grade of P, C, or better in MATH 107 or MATH 107H**Notes:** Has a small laboratory component.**Description:** Discrete and continuous models in ecology: population models, predation, food webs, the spread of infectious diseases, and life histories. Elementary biochemical reaction kinetics; random processes in nature. Use of software for computation and graphics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 840 Numerical Analysis I****Crosslisted with:** CSCE 440, CSCE 840, MATH 440**Prerequisites:** CSCE 155A, CSCE 155E, CSCE 155H, CSCE 155N, or CSCE 155T; MATH 107.**Notes:** Credit toward the degree may be earned in only one of the following: CSCE/MATH 440/840 and MECH 480/880.**Description:** Principles of numerical computing and error analysis covering numerical error, root finding, systems of equations, interpolation, numerical differentiation and integration, and differential equations. Modeling real-world engineering problems on digital computers. Effects of floating point arithmetic.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**MATH 841 Approximation of Functions****Crosslisted with:** CSCE 441, CSCE 841, MATH 441**Prerequisites:** MATH 221/MATH 221H and MATH 314/MATH 314H.**Description:** Polynomial interpolation, uniform approximation, orthogonal polynomials, least-first-power approximation, polynomial and spline interpolation, approximation and interpolation by rational functions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**Groups:** Advanced Mathematics Courses**MATH 842 Methods of Applied Mathematics I****Prerequisites:** MATH 821 and 814, or their equivalents**Description:** Interdependence between mathematics and the physical and applied sciences. Includes the calculus of variations, scaling and dimensional analysis, regular and singular perturbation methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 843 Methods of Applied Mathematics II****Prerequisites:** MATH 842 or permission**Description:** Application of partial differential equation models to problems in the physical and applied sciences. Includes derivation of partial differential equations, the theory of continuous media, linear and nonlinear wave propagation, diffusion, transform methods, and potential theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 845 Number Theory****Crosslisted with:** MATH 445**Prerequisites:** MATH 310 or 310H.**Description:** Fundamentals of number theory, including congruences, primality tests, factoring methods. Diophantine equations, quadratic reciprocity, continued fractions, and elliptic curves.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 847 Numerical Linear Algebra****Crosslisted with:** CSCE 447, CSCE 847, MATH 447**Prerequisites:** MATH 314**Description:** Mathematics and algorithms for numerically stable matrix and linear algebra computations, including solution of linear systems, computation of eigenvalues and eigenvectors, singular value decomposition, and QR decomposition.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 942, MATH 942**Groups:** Advanced Mathematics Courses**MATH 850 Discrete Mathematics I****Prerequisites:** MATH 310 or 325**Description:** Enumeration of standard combinatorial objects (subsets, partitions, permutations). Structure and existence theorems for graphs and sub-graphs. Selected classes of error-correcting codes. Extremal combinatorics of graphs, codes, finite sets and posets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MATH 852 Discrete Math II**Prerequisites:** MATH 850**Description:** Enumeration of standard combinatorial objects (subsets, partitions, permutations). Structure and existence theorems for graphs and sub-graphs. Selected classes of error-correcting codes. Extremal combinatorics of graphs, codes, finite sets and posets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 856 Differential Topology****Prerequisites:** MATH 471/871**Description:** Introduction to a selection of topics in differentiable manifolds, smooth maps, vector fields and vector bundles, embeddings and immersions, differential forms, integration on manifolds, and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 865 Introduction to Mathematical Logic****Crosslisted with:** MATH 465**Description:** Semantical and syntactical developments of propositional logic, discussion of several propositional calculi, application of Boolean algebra and related topics, semantics and syntax of first order predicate logic including Godel's completeness theorem, the compactness theorem.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 871 Topology I****Prerequisites:** MATH 325 or MATH 417**Description:** Topological spaces, continuous functions, product and quotient spaces, compactness and connectedness, homotopy, fundamental groups.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MATH 856; MATH 872**MATH 872 Topology II****Prerequisites:** MATH 871 and MATH 417**Description:** Fundamental groups and the van Kampen theorem, covering spaces and the Galois correspondence, applications to groups, homology and the Mayer-Vietoris theorem.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 874M Topics in Chemical Pedagogy - Mathematics Integration****Crosslisted with:** CHEM 874M, TEAC 874M**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. May be counted towards the MAT and MScT degrees in mathematics and statistics, not the MA, MS, or PhD. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 887 Probability Theory****Crosslisted with:** MATH 487**Prerequisites:** MATH 314 and MATH 325**Description:** Probability, conditional probability, Bayes' theorem, independence, discrete and continuous random variables, density and distribution functions, multivariate distributions, probability and moment generating functions, the central limit theorem, convergence of sequences of random variables, random walks, Poisson processes and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 889 Stochastic Processes****Crosslisted with:** MATH 489**Prerequisites:** MATH 314 and STAT/MATH 380 (or STAT 880).**Description:** Markov chains, continuous-time Markov processes, the Poisson process, Brownian motion, introduction to stochastic calculus.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Advanced Mathematics Courses**MATH 896 Seminar in Mathematics****Crosslisted with:** MATH 496**Prerequisites:** Permission.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Seminars, Ind Study, Topics**MATH 897 Reading Course****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** IND

MATH 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

MATH 901 Algebra I

Prerequisites: MATH 818 or permission

Description: In-depth treatment of groups, rings, modules, algebraic field extensions, Galois theory, multilinear products, categories.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 902 Algebra II

Prerequisites: MATH 818 or permission

Description: In-depth treatment of groups, rings, modules, algebraic field extensions, Galois theory, multilinear products, categories.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 905 Commutative Algebra

Prerequisites: MATH 818 or permission

Description: Selected topics from classical ideal theory, Dedekind rings, completions, local rings, valuation theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 909 Theory of Semigroups

Prerequisites: MATH 818 or permission

Description: Selected topics from semigroups of transformations, ideal structure and homomorphisms, free semigroups, inverse semigroups, matrix representation, decompositions and extensions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 911 Theory of Groups

Description: Basic topics of infinite and finite group theory from among geometric, combinatorial, and algorithmic group theory, homology of groups, solvable and nilpotent groups and representation theory.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

MATH 913 Introduction to the Theory of Rings

Prerequisites: MATH 818

Description: Elementary ring theory and examples of rings, the Jacobson radical and the structure of semi-simple rings, rings with minimum condition, Wedderburn's theorem, structure of modules.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 915 Homological Algebra

Prerequisites: MATH 902 or permission

Description: Basic topics in homological algebra, including homology of complexes, extensions, tensor and torsion products and homological dimension, with application to rings and algebras.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 918 Topics in Algebra

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

MATH 921 Real Analysis I

Prerequisites: MATH 818, 826, and 871 or permission

Description: Semicontinuity, equicontinuity, absolute continuity, metric spaces, compact spaces, Ascoli's theorem, Stone Weierstrass theorem, Borel and Lebesgue measures, measurable functions, Lebesgue integration, convergence theorems, L_p spaces, general measure and integration theory, Radon-Nikodym theorem, Fubini theorem, Lebesgue-Stieltjes integration.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 922 Real Analysis II

Prerequisites: MATH 818, 826, and 871 or permission

Description: Semicontinuity, equicontinuity, absolute continuity, metric spaces, compact spaces, Ascoli's theorem, Stone Weierstrass theorem, Borel and Lebesgue measures, measurable functions, Lebesgue integration, convergence theorems, L_p spaces, general measure and integration theory, Radon-Nikodym theorem, Fubini theorem, Lebesgue-Stieltjes integration.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 923 Topics in Analysis

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

MATH 924 Theory of Analytic Functions I

Prerequisites: MATH 826 or permission

Description: Complex number field, elementary functions, analytic functions, conformal mapping, integration and calculus of residues, entire and meromorphic functions, higher transcendental functions, Riemann surfaces.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 925 Theory of Analytic Functions II

Prerequisites: MATH 826 or permission

Description: Complex number field, elementary functions, analytic functions, conformal mapping, integration and calculus of residues, entire and meromorphic functions, higher transcendental functions, Riemann surfaces.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 927 Asymptotic Methods in Applied Mathematics

Description: Methods for approximating the solutions of differential equations, including local analysis near singular points, singular perturbation methods, boundary layer theory, WKB Theory, and multiple-scale methods. Asymptotic expansion of Laplace and Fourier integrals. Illustration of the use of asymptotics from journals in mathematics, science, and engineering.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 928 Functional Analysis I

Prerequisites: MATH 818 and 921, or permission

Description: Banach and Hilbert Spaces, linear operators and functionals, completely continuous operators, spectral theory, integral equations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 929 Functional Analysis II

Prerequisites: MATH 818 and 921, or permission

Description: Banach and Hilbert Spaces, linear operators and functionals, completely continuous operators, spectral theory, integral equations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 932 Advanced Ordinary Differential Equations I

Prerequisites: MATH 826 or permission

Description: Cauchy-Peano existence theorems, continuity and differentiability of solutions with respect to initial conditions, differential inequalities, uniqueness theorem, oscillation theory, Poincare-Bendixson theory, stability theory, almost periodic solutions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 933 Advanced Ordinary Differential Equations II

Prerequisites: MATH 826 or permission

Description: Cauchy-Peano existence theorems, continuity and differentiability of solutions with respect to initial conditions, differential inequalities, uniqueness theorem, oscillation theory, Poincare-Bendixson theory, stability theory, almost periodic solutions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 934 Topics in Differential Equations

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

MATH 935 Advanced Methods in Applied Mathematics I

Prerequisites: MATH 821 and 826

Description: Banach and Hilbert spaces, operator theory with application to differential and integral equations; spectral theory for compact, self-adjoint operators.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 936 Advanced Methods in Applied Mathematics II

Prerequisites: MATH 935 or permission

Description: Distributions, Green's functions and boundary value problems; integral transforms and spectral representations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 937 Nonlinear Partial Differential Equations

Prerequisites: MATH 843 or 941 or permission

Description: Nonlinear wave propagation and shock structure with applications, dispersive waves, hyperbolic systems, group velocity and the method of stationary phase. WKB approximation and perturbation methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 938 Mathematical Modeling

Prerequisites: MATH 842, 843 and permission

Description: Advanced course in mathematical modeling for students who desire experience in formulating and analyzing open-ended, real-world problems in the natural and applied sciences. Participation in a few group projects that require conceptualization and analytical, numerical, and graphical analysis with formal oral and written presentation of the results.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 939 Topics in Applied Mathematics

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

MATH 941 Partial Differential Equations

Prerequisites: MATH 826

Description: Theory of hyperbolic, elliptic, and parabolic equations. Classification, existence and uniqueness result, solution representations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MATH 942 Numerical Analysis III**Crosslisted with:** CSCE 942**Prerequisites:** CSCE/MATH 840 or 841 or 847**Description:** Advanced topics in numerical analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 953 Algebraic Geometry****Prerequisites:** MATH 901-902**Description:** Affine geometry, coordinate rings, the Zariski topology, function fields and birational geometry, the Nullstellensatz, Krull dimension and transcendence degree, smoothness, projective geometry, divisors, curves.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 958 Topics in Discrete Mathematics****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 18**Format:** LEC**MATH 990 Topics in Topology****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 18**Format:** LEC**MATH 995 Research Seminar****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**MATH 996 Seminar****Description:** Advanced topics in one or more branches of mathematics.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MATH 997 Reading Course****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**MATH 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Mechanical Engineering (MECH)

MECH 801 Analytical Methods in Engineering I**Description:** Basic topics in real analysis and linear algebra with examples of applications from diverse branches of engineering and applied physics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 802 Analytical Methods in Engineering II****Prerequisites:** MECH 801 or permission**Description:** Continuation of ENGM 801 topics in complex analysis, linear algebra, ordinary and partial differential equations, and other areas of applied mathematics. Examples of applications from diverse branches of engineering and applied physics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 803 Internal Combustion Engines****Crosslisted with:** MECH 403**Prerequisites:** MECH 300 or equivalent.**Description:** Basic cycle analysis and engine types, fundamental thermodynamics and operating characteristics of various engines are analyzed, combustion processes for spark and compression-ignition engines, fuels, testing procedures, and lubrication systems are evaluated. Emphasis on the thermodynamic evaluation of the performance and understanding the basic operation of various engine types.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 804 Theory of Combustion****Crosslisted with:** MECH 404**Prerequisites:** MECH 300 and MECH 420/MECH 820.**Description:** Stoichiometric analysis of combustion processes. Energy transfer, flame propagation, and transformation velocities during combustion. Combustor applications and design considerations. Emission formation and methods of control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 805 Turbomachinery****Crosslisted with:** MECH 405**Prerequisites:** MECH 300 and MECH 310/CIVE 310.**Description:** Thermodynamic analysis and design of axial and radial flow turbines, compressors, and pumps. Fundamentals of the operating characteristics and performance parameters of turbomachines will be evaluated. Cavitation and blade element theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MECH 806 Air Conditioning Systems Design**Crosslisted with:** MECH 406**Prerequisites:** MECH 300 or equivalent.**Description:** Application of thermodynamic and fluid dynamic principles to the design of air conditioning systems. Comprehensive design project is an integral part of the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 807 Power Plant Systems Design****Crosslisted with:** MECH 407**Prerequisites:** MECH 300 or equivalent.**Description:** Application of thermodynamic and fluid dynamic principles to the design of Power Plants. Comprehensive design project is an integral part of the course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 808 Heat Exchanger Design****Crosslisted with:** MECH 408**Prerequisites:** MECH 300 or equivalent.**Description:** Design methodology for various heat exchangers employed in mechanical engineering. Introduction to computer-aided design as applied to heat exchangers. Practical exercises in actual design tasks.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 810 Viscous Flow I****Prerequisites:** MECH 310 and MATH 821**Description:** Dynamics and kinematics of laminar flows of viscous fluids. Development of the equations of motion in general and some exact solutions to them. Flows with small to large (laminar) Reynolds numbers including fundamental concepts of the boundary layer on a flat plate.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 918; MECH 812**MECH 812 Viscous Flow II****Prerequisites:** MECH 810, MATH 822 or MATH 824 or MECH 890**Description:** Vorticity dynamics. Ideal flows in a plane and in axisymmetric and three-dimensional geometries. Advanced boundary layer theory. Introduction to stability and turbulent flows.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 813 Aerodynamics****Crosslisted with:** MECH 413**Prerequisites:** MECH 200 and MECH 310/CIVE 310.**Description:** Subsonic and supersonic air flow theory, dynamics of flight, performance parameters, rotoranalysis, and special topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 814 Compressible Flow****Crosslisted with:** MECH 414**Prerequisites:** MECH 300 and MECH 310/CIVE 310.**Description:** Analysis of the flow of compressible fluids by means of the momentum equation, continuity equation, and the laws of thermodynamics and some application of thermodynamic laws to incompressible fluids.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 815 Two-Phase Flow****Crosslisted with:** MECH 415**Prerequisites:** MECH/CIVE 310; MECH 380 or parallel.**Description:** Transport phenomena of homogeneous and heterogeneous types of mixtures such as solid-liquid, liquid-liquid, and liquid-gas. Properties of components and mixtures. Flow induced vibrations and parameter distributions. Optimization and design problems in multiphase systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 816 Engineering Acoustics****Crosslisted with:** MECH 416**Prerequisites:** MECH 310 and MATH 221/MATH 821.**Description:** Transverse and longitudinal traveling waves. Acoustic wave equation of fluids. The reflection, transmission, radiation, reception, absorption, and attenuation of sound. Acoustic cavities and waveguides. Sound propagation in pipes, resonators and filters.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 820 Heat Transfer****Crosslisted with:** MECH 420**Prerequisites:** MECH 310.**Description:** Heat transfer by conduction, convection, and radiation. Correlation of theory with experimental data and engineering design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AREN 412; AREN 810; MECH 428, MECH 828**MECH 821 Elements of Nuclear Engineering****Crosslisted with:** MECH 421, ENGR 421**Prerequisites:** ENGR 300 or ENGR 301 or ENGR 310; MATH 208/ MATH 208H; and PHYS 212/PHYS 212H**Description:** Survey of nuclear engineering concepts and applications. Nuclear reactions, radioactivity, radiation interaction with matter, reactor physics, risk and dose assessment, applications in medicine, industry, agriculture, and research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ENGR 410; ENGR 420

MECH 822 Industrial Quality Control**Crosslisted with:** MECH 422**Prerequisites:** MECH 321 or STAT 380.**Description:** Statistical process control and quality assurance techniques in manufacturing. Control charts, acceptance sampling, and analyses and design of quality control systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**MECH 824 Laser Material Processing with Compressible Flow Perspective****Crosslisted with:** MECH 424**Prerequisites:** Permission.**Description:** Fundamentals of laser material processing. Laser material interactions from the compressible flow perspective. Analytical, semi-analytical, and numerical approaches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 825 Solar Energy Engineering****Crosslisted with:** MECH 425**Prerequisites:** MECH 420 or permission.**Description:** Conversion of solar energy into more useful forms with emphasis on environmental heating and cooling applications. Includes solar energy availability, solar collectors and design, solar systems and their simulation and solar economics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 826 Heat Transfer at Nanoscales and in Ultrashort Time Domains****Crosslisted with:** MECH 426**Prerequisites:** MECH 420.**Description:** Heat transfer in nanoscale and nanostructured materials. Heat transfer in ultrafast laser materials processing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 828 Analysis of Thermal Data****Crosslisted with:** MECH 428**Prerequisites:** MECH 420 or parallel.**Description:** Indirect measurement of thermal properties and heat flux are explored with various methods, and optimization, with examples drawn from engineering practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**MECH 831 Computational Heat Transfer and Fluid Flow****Crosslisted with:** MECH 431**Prerequisites:** MECH 310; MATH 314; MECH 420 or parallel.**Description:** Finite difference methods for steady and transient diffusion and convection-diffusion problems. Finite volume technique for the solution of multi-dimensional fluid flow, and heat and mass transfer problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 836 Introduction to Continuum Biomechanics****Crosslisted with:** MECH 436**Prerequisites:** MECH 373; MECH 310; MECH 420.**Description:** Introduction to biomechanics. Basic anatomy, biomaterials, kinematics, dynamics, visco-elasticity, bio-fluid mechanics, and bio-heat transfer.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 837 Biomedical Device Design****Crosslisted with:** MECH 437**Prerequisites:** MECH 223, MECH 325 and MECH 373, or equivalent**Description:** Design of devices intended for use in biomedical environments. Introduction to modeling of the bio-environments, bio-materials, and material selection. Overview of design methodologies and strategies used in biomedical device design from a material properties perspective. Introduction to federal regulation and other pertinent issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 838 Mechanics of Biomaterials****Crosslisted with:** MECH 438**Prerequisites:** MECH 325 or AGEN/BSEN 324 or parallel**Description:** Theory, application, simulation, and design of biomaterials that apply mechanical principles for solving medical problems (case studies in artery, brain, bone, etc.). Tentative Topics include Mechanical characterization of biomaterials; Bio-manufacturing a tissue; Function-structure relationship; Design and analysis of medical implants; Active response of biomaterials: growth and remodeling mechanism; Cellular behavior and measurements, etc.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 842 Intermediate Kinematics****Crosslisted with:** MECH 442**Prerequisites:** MECH 342.**Description:** Analytical cam design. Geometry of constrained plane motion and application to the design of mechanisms. Analysis and synthesis of pin-jointed linkage mechanisms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MECH 843 Introduction to Piezoelectricity with Applications

Prerequisites: MECH 325, MECH 373, or equivalent, or permission

Description: Electrostatics, equations of piezoelectricity, static solutions, propagation of plane waves, waves in plates, surface waves, equations for piezoelectric rods and plates in extension and flexure, finite element formulation, finite element analysis of static, time-harmonic, and transient problems with applications in smart structures and piezoelectric devices.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MECH 844 Intermediate Dynamics of Machinery

Crosslisted with: MECH 444

Prerequisites: MECH 342 and MECH 350.

Description: Fundamentals of vibration, vibration and impact in machines, balance of rotors, flexible rotor dynamics and instabilities, parametric vibration, advanced dynamics and design of cam mechanisms, and dynamics of flywheel.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MECH 915

MECH 845 Mechanical Engineering Design Concepts

Crosslisted with: MECH 445

Prerequisites: MECH 200, MECH 342, MECH 350, and MECH 310/CIVE 310.

Description: Development of design concepts. Introduction to synthesis techniques and mathematical analysis methods. Applications of these techniques to mechanical engineering design projects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MECH 848 Advanced Mechanics of Materials

Crosslisted with: MECH 448

Prerequisites: MECH 373, MECH 325.

Description: Stresses and strains at a point. Theories of failure. Thick-walled pressure vessels and spinning discs. Torsion of noncircular sections. Torsion of thin-walled sections, open, closed, and multicelled. Bending of unsymmetrical sections. Cross shear and shear center. Curved beams. Introduction to elastic energy methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MECH 915; MECH 933; MECH 935; MECH 938; MECH 952

MECH 849 Advanced Dynamics

Crosslisted with: MECH 449

Prerequisites: MECH 373 and MATH 221/821.

Description: Particle Dynamics using Newton's laws, energy principles, momentum principles. Rigid body dynamics using Euler's equations and Lagrange's equations. Variable mass systems. Gyroscopic motion.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MECH 935

MECH 850 Mechanical Engineering Control Systems Design

Crosslisted with: MECH 450

Prerequisites: MECH 350.

Description: Applications of control systems analysis and synthesis for mechanical engineering equipment. Control systems for pneumatic, hydraulic, kinematic, electromechanical, and thermal systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MECH 851 Introduction to Finite Element Analysis

Prerequisites: MECH 325 and MECH 880 or permission.

Description: Matrix methods of analysis. The finite element stiffness method. Computer programs. Applications to structures and soils. Introduction to finite element analysis of fluid flow.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MECH 950

MECH 852 Experimental Stress Analysis I

Crosslisted with: MECH 452

Prerequisites: MECH 325.

Description: Investigation of the basic theories and techniques associated with the analysis of stress using mechanical strain gages, electric strain gages, brittle lacquer, photoelasticity, and membrane analogy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MECH 952

MECH 853 Robotics: Kinematics and Design

Crosslisted with: MECH 453

Description: Robotics synthesize some aspects of human function by the use of mechanisms, sensors, actuators, and computers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MECH 854 Introduction to Continuum Modeling

Crosslisted with: MECH 454

Prerequisites: MATH 221/821, MECH 325 and MECH 373.

Description: Basic concepts of continuum modeling. Development of models and solutions to various mechanical, thermal and electrical systems. Thermo-mechanical and electro-mechanical coupling effects. Differential equations, dimensional methods and similarity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MECH 855 Vehicle Dynamics**Crosslisted with:** MECH 455**Prerequisites:** MECH 343 and MECH 350.

Description: Introduction to basic mechanics governing automotive vehicle dynamic acceleration, braking, ride, handling and stability. Analytical methods, including computer simulation, in vehicle dynamics. The different components and subsystems of a vehicle that influence vehicle dynamic performance.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 856 Dynamics of Internal Combustion Engines****Crosslisted with:** MECH 456**Prerequisites:** MECH 342 and MECH 343.

Description: Basics of design of the internal combustion engines. Design of various engine parts such as pistons, connecting rods, valve trains, crankshafts, and the vibration dampers. Dynamics of the engine. The vibration of the crankshaft assembly and the valve train. Balancing of the engines.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 857 Mechatronic Systems Design****Crosslisted with:** MECH 457**Prerequisites:** ECEN 231; MECH 350 or parallel.

Notes: Lab sessions allow for constructing mechatronic systems. Lab time arranged. A comprehensive design project included.

Description: Theory, application, simulation, and design of systems that integrate mechanical, computer, and electronic components.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MECH 958**MECH 858 Digital Control of Mechanical Systems****Crosslisted with:** MECH 458**Prerequisites:** MECH 450.

Description: Introduction to digital measurement and control of mechanical systems. Applications of analysis and synthesis of discrete time systems.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 870 Theory and Practice of Materials Processing****Crosslisted with:** MECH 470

Description: Theory, practice and application of conventional machining, forming and non-traditional machining processes with emphasis on tool life, dynamics of machine tools and adaptive control.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MECH 970**MECH 874 Manufacturing Systems I****Crosslisted with:** MECH 474

Description: Principles of automated production lines; analysis of transfer lines; group technology; flexible manufacturing systems; and just-in-time; and optimization strategies for discrete parts manufacturing.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 875 Introduction to Mechanical Vibrations****Crosslisted with:** MECH 475**Prerequisites:** MECH 373 and MATH 221.

Description: Review of rigid body dynamics; equations of motion, free vibration, damping; linear response of one, two, and multi-degree of freedom systems; forced vibrations, harmonic, periodic, impulse, and general responses; resonance and vibration isolation; rotating imbalance; Fourier transforms, digitization and analysis of experimental data.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 876 Manufacturing Information Systems****Crosslisted with:** MECH 476

Prerequisites: Senior standing; CSCE 155A, CSCE 155E, CSCE 155H, CSCE 155N, or CSCE 155T or equivalent.

Description: An exploration of information systems and their impact in a manufacturing environment. Software, hardware, database systems, enterprise resource planning, networking, and the Internet.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 880 Numerical Methods in Engineering****Crosslisted with:** MECH 480**Prerequisites:** MATH 221/MATH 821; CSCE 155N.

Notes: Credit towards the degree cannot be earned in both CSCE/MATH 440/840 and MECH 480/880. Linear Algebra recommended.

Description: Numerical algorithms and their convergence properties in: solving nonlinear equations; direct and iterative schemes for linear systems of equations; eigenvalue problems; polynomial and spline interpolation; curve fitting; numerical integration and differentiation; initial and boundary values problems for Ordinary Differential Equations (ODEs) and systems of ODEs with applications to engineering; finite difference methods for partial differential equations (potential problems, heat-equation, wave-equation).

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CHME 496, CHME 896; MECH 888**MECH 881 Introduction to Nuclear Engineering****Prerequisites:** MATH 820 or 821

Description: Introduction to nuclear physics, radiation interaction with matter, reactor fundamentals, and the application of equipment and principles associated with reactor safety and operations.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MECH 883 Engineering Analysis with Finite Elements**Crosslisted with:** MECH 483**Prerequisites:** MECH 310; MECH 343; MECH 350; MECH 420 or parallel.**Description:** Analysis of engineering systems using finite elements; a critical and challenging task performed during the design process for many engineering systems. Four very distinct domains are studied: Structural stress analysis, heat transfer, fluid flow, and modal analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 888 Nonlinear Optimization in Engineering****Prerequisites:** MATH 208; MATH 314; MECH 480/MECH 880**Notes:** Numerical analysis and computer programming recommended.**Description:** Nonlinear optimization using gradient-based and evolutionary methods. Constrained and unconstrained nonlinear optimization, Karush-Kuhn-Tucker conditions, penalty and barrier methods. Applications to optimal design in sciences and engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**MECH 890 Advanced Analysis of Mechanical Engineering Systems****Description:** Engineering mathematics review. Formulation and solution of engineering problems including basic laws, lumped parameter models, and continuous systems. Examples drawn from all areas of mechanical engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MECH 812**MECH 891 Special Topics in Engineering Mechanics****Crosslisted with:** MECH 491**Description:** Treatment of special topics in engineering mechanics by experimental, computational and/or theoretical methods. Topics vary from term to term.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**MECH 898 Laboratory and Analytical Investigations****Crosslisted with:** MECH 498**Description:** Investigation and written report of research into specific problem in any major area of mechanical engineering.**Credit Hours:** 6.00**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LAB**MECH 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**MECH 900 Advanced Thermodynamics****Prerequisites:** Permission**Description:** Classical thermodynamics providing precise and true understanding; advanced methodologies and applications to mechanical engineering tasks; axiomatic foundations of classical thermodynamics, engineering applications to working substances in motion; systematic generalizations to exotic substances; and selected topics as illustrations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 902 Optimal Control Theory****Prerequisites:** MECH 350 or equivalent.**Description:** Dynamic Programming, The Euler-Lagrange equation, Bang-bang principle in optimal control, Viscosity solutions to the Hamilton-Jacobi-Bellman equation, Pontryagin's Maximum Principle to solve optimal control problems, Linear Quadratic Regulator problems, Numerical solutions to optimal control problems, Calculus of variations to solve infinite dimensional optimization problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**MECH 904 Advanced Combustion Theory****Prerequisites:** MECH 804 or equivalent**Description:** Detailed analysis of modern combustion wave theory, particularly chain reaction calculations and flame temperature determination. Gas dynamics of flames. Advanced mass transfer as applied to combustion. Aerodynamics of flame stabilization by vortices. Critical examination of present experimental techniques and results.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 910 Continuum Mechanics****Prerequisites:** MECH 848 and permission**Description:** The continuum. Geometrical foundations of continuum mechanics. Rectilinear and curvilinear frames. Elements of tensor analysis. Analysis of stress. Analysis of strain. Equations of motion. Constitutive equations. Fundamental laws. Applications to deformable systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 912 Advanced Topics in Fluid Dynamics****Prerequisites:** MECH 812 or permission**Description:** Selected topics from one or two of the following fields: magneto-fluid-mechanics, three-dimensional boundary layers, fluid-mechanical stability, hypersonic flow, theory of turbulence, rarefied gas dynamics or other current research interest area.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MECH 915 Stress Waves in Solids**Prerequisites:** MECH 848; MECH 849**Description:** Waves in rods, beams, strings, and membranes. Sound waves in air. Dilational and distortional waves. Reflection and refraction of waves. Rayleigh surface waves. Love waves. Applications of transform theory and the method of stationary phase to wave analysis. Waves in anisotropic and viscoelastic media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 916 Turbulent Flows****Prerequisites:** MECH 812**Description:** Methods of description and basic equations of turbulent flows. Isotropic and homogeneous turbulence, energy spectra and correlations. Introduction to measurements. Transition theory and experimental evidence. Wall turbulence, engineering calculations of turbulent boundary layers. Free turbulent jets and wakes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 918 Fundamentals of Finite Elements****Description:** Derivation and implementation of the finite element method. Introduction to the theory of finite element methods for elliptic boundary-value problems. Applications to time-independent physical phenomena (e.g., deformation of elastic bodies, heat conduction, steady-state fluid flow, electrostatics, flow through porous media). Basic coding techniques. A basic understanding of ordinary differential equations and matrix algebra as well as some programming skills are assumed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 921 Quality Engineering: Use of Experimental Design and Other Techniques****Description:** Extension of industrial quality control methods and techniques. Off-line and online quality control methods. Development of quality at the design stage through planned experiments and analyses. Experimental design methods include factorial, 2k, 3k, and fractional factorials designs. Includes applied project in design of quality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 922 Conduction Heat Transfer****Prerequisites:** MECH 820 or permission**Description:** Theory of heat conduction; analytical, numerical, graphical and analog methods of solution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 923 Convection Heat Transfer****Prerequisites:** MECH 820 or permission**Description:** Theory of heat transfer by convection. Analytical, numerical, and empirical solutions. Selected applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 924 Radiation Heat Transfer****Prerequisites:** MECH 820 or permission**Description:** Theory of heat transfer by thermal radiation. Formulation and analytical and numerical solutions. Selected applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 925 Manufacturing and Dynamic Systems Modeling****Prerequisites:** MATH 821**Description:** Difference and differential equation models directly from series of observed data. Underlying system analysis including impulse response, stability and feedback interpretation. Forecasting and accuracy of forecasts. Periodic and exponential trends in seasonal series. Modeling two series simultaneously. Minimum mean squared error control and forecasting by leading indicators. Illustrative applications to real life data in science and engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 930 Mechanics of Composite Materials****Prerequisites:** MECH 848 or permission**Description:** Introduction to composite materials. Properties of an anisotropic lamina. Laminated composites. Failure theories. Analysis of composite structures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 932 Advanced Finite Element Methods****Prerequisites:** MECH 831, MECH 890**Description:** Review of basic finite element methods including field problems and continuum solid mechanics problems. Advanced linear methods: eigenvalues and mode superposition, convection-diffusion problems, Stokes flow problems. Nonlinear methods for heat transfer, fluid flow, and solid mechanics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 933 Theory of Elasticity I****Prerequisites:** MECH 848 and MATH 821**Description:** Plane stress and strain. Solution of two-dimensional problems by polynomials. Two-dimensional problems in polar coordinates. Triaxial stress and strain. Torsion of noncircular cross section. Bending of prismatical bars. Hydrodynamical analogies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MECH 942

MECH 934 Theory of Elasticity II**Prerequisites:** MECH 933**Description:** Foundation of the theory of large deformation. Equations of linear elasticity. Complex representation of the general solution of the equations of plane theory of elasticity. Conformal mapping. Solutions of problems in three-dimensional elasticity in terms of potential functions. Axially symmetric problems. Variational methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 935 Nonlinear Mechanics****Prerequisites:** MECH 848, MECH 849**Description:** Physical systems in solid mechanics which lead to nonlinear differential equations. Graphical, numerical, and exact solutions of the governing differential equations. Physical interpretation of the solution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 936 Theory of Elastic Stability****Prerequisites:** MECH 325 or MECH 373 and MATH 821**Description:** Lateral buckling of beams; failure of columns; bending and buckling of thin plates and shells. Consideration of classical and modern theories.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 937 Theory of Plates and Shells I****Prerequisites:** MECH 848 and MATH 821**Description:** Basic equations for the bending and stretching of thin plates with small deformations. General theory of deformation of thin shells with small deflections. Large deformations theories of plates and shells. Effect of edge conditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 938 Theory of Plates and Shells II****Prerequisites:** MECH 848, MATH 821**Description:** Large deflection shell theory. Critical examination of effects of boundary conditions. Additional topics from folded plates, orthotropic plates and shells, sandwich plates and shells, use of complex transformations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 939 Viscoelasticity****Prerequisites:** MECH 848 or MECH 913, MATH 821 or MATH 822**Description:** Introduction to linear and nonlinear viscoelastic material behavior. One dimensional response. Linearity of material response. Quasi-static and dynamic problems. Time-temperature superposition. Viscoelastic beams. Multidimensional response. Nonlinear response.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 940 Fracture Mechanics****Prerequisites:** MECH 848 or permission**Description:** Modes of failure. Elastic stress field near cracks. Theories of brittle fracture. Elastic fracture mechanics. Elastic-plastic analysis of crack extension. Fracture toughness testing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 941 Mechanics of Dislocations and Cracks****Prerequisites:** MECH 848 or permission**Description:** Mathematical theory of straight dislocations in isotropic and anisotropic elastic media. Dislocations on and near an interface. Dislocation interactions. Discrete and continuously distributed dislocations. Applications to mechanics of materials: grain boundaries and dislocation pile-ups. Applications to fracture mechanics: Griffith-Inglish crack, Zener-Stroh-Koehler crack, Bilby-Cottrell-Swinden-Dugdale crack.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 942 Theory of Plasticity****Prerequisites:** MECH 933**Description:** Basic concepts of plasticity. Yield conditions and yield surfaces. Torsion of cylindrical bars and Saint Venant-Mises and Prandtl-Reuss theories. General theory of plane strain and shear lines. Steady and pseudo-steady plastic flow. Extremum principles. Engineering applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 943 Machine Design****Prerequisites:** MECH 842 or permission**Description:** The student's competence in designing machine members to withstand various static and dynamic loads, to analyze failure, and to design members for optimum balance of weight, cost, and reliability is advanced to a level beyond that of MECH 843. Impact loading, fatigue, optimum design of mechanical components, lubrication, and environmental considerations (mechanical properties at high and low temperature, creep, stress corrosion, fretting corrosion, etc.) are tested. Laboratory includes completion of one or more realistic individual design projects and the use of engineering case studies to illustrate more complex interactive design than would be feasible to actually carry out in one semester.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MECH 945 Probabilistic Design of Machine Elements**Prerequisites:** MECH 845; STAT 880; or permission**Description:** Application of probability to the design of machine elements. Rational determination of component factor of safety based on probability densities of strength and of in-service stress. Statistical study of cumulative damage resulting from varying magnitude stress cycles. Probability of survival of fatigue-life design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 950 Impact Engineering****Prerequisites:** MECH 851**Description:** Design and analysis of structures that undergo impact. Nonlinear, large-deformation finite element analysis of structures. Vehicle crashworthiness, roadside safety design, sheet metal forming, and projectile impacts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 951 Advanced Topics in Finite Element Methods****Prerequisites:** MECH 851 or MECH 918, or permission**Description:** Theory and application of finite element methods. Topic varies with interest of instructor and may include: finite elements for the analysis of fracture; mixed variational formulations; hybrid stress elements; plasticity; non-linear elasticity; large deformations of structures; plate and shell elements; transverse shear effects in beams, plates and shells; "locking" phenomena; treatment of singularities; dynamics of large systems; "enhanced" strain methods; methods for solving non-linear algebraic systems; architecture of computer codes for non-linear finite element analysis; and treatment of constraints arising in nearly incompressible material models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 952 Experimental Stress Analysis II****Prerequisites:** MECH 848 and MECH 852**Description:** Surface strains and their measurement, principally by bonded wire resistance strain gages. Static and dynamic measurements using both oscilloscope and direct writing oscillograph, associated electrical circuits. Use of brittle coating in conjunction with strain gages. Evaluation of stresses from strain data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 958 Advanced Mechatronics****Prerequisites:** MECH 457/MECH 857**Description:** Theory, application, simulation, and design of systems that integrate mechanical, computer, and electronics components. Analyze, design, simulate, and build mechatronic systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 970 Advanced Manufacturing Processes****Prerequisites:** IMSE 870 or permission**Description:** Theory, practice and technology of advanced manufacturing processes, with emphasis on process mechanism, surface integrity, tool and machine design, adaptive control and expert systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 975 Advanced Vibrations****Prerequisites:** MECH 875**Description:** Variational mechanics, Hamilton's principle, and energy formulations for linearly elastic bodies. Eigenvalue and boundary value problems. Non-self adjoint systems. Approximate methods: Ritz and Galerkin. Gyroscopic systems. Nonconservative systems. Perturbation theory for the eigenvalue problem. Dynamics of constrained systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MECH 991 Seminar****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 10**Format:** LEC**MECH 996 Advanced Laboratory and Analytical Investigations****Description:** Semester projects involving research into a specific problem in any major area of mechanical engineering.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LAB**MECH 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Mechanized Systems Management (MSYM)

MSYM 812 Hydraulic Power Systems**Prerequisites:** MSYM 245 and 312**Description:** Theory and application of fluids under controlled pressure to perform work in mobile and industrial applications. Operation of components and functional planning of circuits with emphasis on troubleshooting and analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MSYM 816 Sensors and Control Systems for Agri-Industries**Prerequisites:** MSYM 245**Description:** Application of sensors for measurement of process control variables and implementation of microcomputer-based measurement and control systems. Basic electrical and electronic instrumentation plus control of electrically, pneumatically and/or hydraulically powered systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MSYM 832 Mechanized Agricultural Systems****Prerequisites:** Permission**Notes:** Offered odd-numbered calendar years.**Description:** Advanced concepts of equipment used in agriculture. Site specific management (precision agriculture). Hardware development and information technologies applied to generic agricultural production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MSYM 833 Equipment and Tractor Testing****Crosslisted with:** MSYM 433**Prerequisites:** MSYM 232; and STAT 218 or STAT/MATH 380 or MECH 321**Notes:** Offered spring semester in even-numbered calendar years.**Description:** Principles and procedures involved in testing agricultural equipment and tractors. Actual test planned, scheduled, conducted and reported. Test may be based upon procedures used at the Nebraska Tractor Testing Laboratory or involve other equipment being used for research in the department.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**MSYM 852 Irrigation Systems Management****Crosslisted with:** MSYM 452, WATS 452, AGRO 452**Prerequisites:** MSYM 109 or PHYS 141 or PHYS 151 or PHYS 211**Notes:** AGRO/SOIL 153 recommended.**Description:** Irrigation management and the selection, evaluation, and improvement of irrigation systems. Includes soil-water measurement, crop water use, irrigation scheduling, irrigation efficiency, measurement of water flow, irrigation systems, groundwater and wells, pumping systems, applying chemicals with irrigation systems, and environmental and water resource considerations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**Prerequisite for:** AGEN 854, MSYM 854; AGEN 955, AGRO 955, CIVE 955, GEOL 985; MSYM 855**MSYM 854 Irrigation Laboratory and Field Course****Crosslisted with:** AGEN 854**Prerequisites:** AGEN 453/853, or MSYM 452/852**Notes:** Offered during the summer pre-session in even calendar years.**Description:** A laboratory and field course which emphasizes irrigation water supply and distribution systems. Laboratory topics include performance of surface, sprinkler, and drip irrigation systems; pipeline hydraulics; flow in streams, canals, and irrigation pipelines; irrigation pumping systems; irrigation well hydraulics; and soil water properties. The field trip includes visits to irrigation water supply and hydroelectric power projects; water resources agencies; irrigation field research sites; and manufacturers and installers of agricultural irrigation systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Offered:** SUMMER**MSYM 855 Advanced Irrigation Management****Prerequisites:** MSYM 852 or equivalent**Notes:** AGRO 861 recommended**Description:** Theory and practice in on-farm irrigation management including irrigation response functions and irrigation uniformity concepts; field evaluation of surface and sprinkler irrigation systems; estimation of evapotranspiration and irrigation scheduling; water quality problems and salinity control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MSYM 862 Equipment Systems****Crosslisted with:** MSYM 462**Prerequisites:** Senior standing in MYSM.**Notes:** Capstone course.**Description:** Team-based activities to evaluate equipment systems, make technical and economic recommendations, develop professional written and oral reports. Topics include equipment system performance and management, project scheduling and planning, cost estimation, reliability analysis, and risk assessment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MSYM 865 Food Engineering Unit Operations****Crosslisted with:** FDST 465, FDST 865, MSYM 465**Prerequisites:** FDST/MSYM 363.**Description:** Unit operations and their applications to food processing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MSYM 869 Bio-Atmospheric Instrumentation

Crosslisted with: AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, GEOG 869, HORT 807, METR 869, NRES 869

Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.

Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Physical Geography

MSYM 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, POLS 475, POLS 875

Prerequisites: Senior standing.

Notes: Capstone course.

Description: Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: American Government&Public Pol

MSYM 892 Special Topics in Mechanized Systems Management

Crosslisted with: MSYM 492

Prerequisites: Permission

Description: Subject matter in emerging areas of Mechanized Systems Management not covered in other courses within the curriculum. Topics, activities, and delivery methods vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

MSYM 896 Principles and Problems in Mechanized Agriculture

Crosslisted with: MSYM 496

Prerequisites: 15 hours in MSYM or closely related area.

Description: Individual or group projects in research, literature review, or extension of course work under the supervision and evaluation of a departmental faculty member.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 12

Format: IND

MSYM 897 Masters Project

Crosslisted with: AGEN 897, BSEN 897

Prerequisites: Admission to M.S. in Agricultural and Biological Systems Engineering or M.S. in Mechanized Systems Management, and permission of major advisor

Notes: Intended for students who are pursuing an Option II or III master's degree in Agricultural and Biological Systems Engineering, or Mechanized Systems Management.

Description: Conception, design, development, and completion of a project that requires data collection, synthesis, analysis of results, and the development of a final written report that will be defended in the final oral examination.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: IND

MSYM 898 Special Projects in Management of Mechanized Systems

Prerequisites: 15 hours in mechanized systems management or closely related area

Description: Individual project specifically designed for a student to pursue or explore a special topic under the guidance and evaluation of a faculty member.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 5

Format: IND

MSYM 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

Medieval and Renaissance Studies (MRST)

MRST 814 Medieval Culture

Crosslisted with: HIST 414, HIST 814, MRST 414

Prerequisites: Junior standing.

Notes: Pre-1800 content.

Description: Historical context of changes in religion, literature, philosophy, and the arts, 400-1450.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Pre-1800 History

MRST 821 The German Reformation**Crosslisted with:** HIST 421, HIST 821, RELG 421, MRST 421**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** The cultural and intellectual developments of the German Reformation against its social background. The religious and political events of the first half of the sixteenth century. Transition from medieval to modern Christianity. The transmission and revolutionary nature of evangelical doctrines. The gradual institutionalization of the new churches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**MRST 826 Reformation Thought****Crosslisted with:** HIST 426, HIST 826, MODL 426, MODL 826, MRST 426, RELG 426, RELG 826**Prerequisites:** Junior standing**Description:** Life and thought of significant figures and schools of thought in the Reformation period**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**MRST 830 Early European History Through Biography****Crosslisted with:** HIST 430, HIST 830, MRST 430**Prerequisites:** Junior standing**Notes:** Pre-1800 content.**Description:** Individuals from late medieval/early modern Europe, such as Joan of Arc, Henry V, and Eleanor of Aquitaine. Examines how history can be used to serve social, cultural, and political needs, and the difficulties of determining historic truth about a person or event.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History**MRST 832 England: Reformation to Revolution, 1530-1660****Crosslisted with:** HIST 432, HIST 832, MRST 432**Prerequisites:** Junior standing.**Notes:** Pre-1800 content.**Description:** History of English society, politics, and culture from the time of Henry VIII through that of Elizabeth I, Shakespeare, Donne, Charles I, Cromwell, and Milton.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Pre-1800 History

Meteorology (METR)

METR 808 Microclimate: The Biological Environment**Crosslisted with:** AGRO 408, GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, AGRO 808, GEOG 808, HORT 808, NRES 808**Prerequisites:** Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering.**Description:** Physical factors that create the biological environment.

Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGRO 907, HORT 907, METR 907, NRES 907; BSEN 954, NRES 954**Groups:** Physical Geography**METR 811 Dynamic Meteorology I****Prerequisites:** CSCE 150E; MATH 208/208H; METR 205; PHYS 211/211H**Description:** Equations of thermodynamics, momentum, and continuity are derived and applied to atmospheric motion. Energy conservation, flows, and conversions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 812 Dynamic Meteorology II****Prerequisites:** CSCE 150E; MATH 221/821; METR 311; PHYS 211/211H**Description:** Applications of the principles of dynamic meteorology to the problems of forecasting and meteorological problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 815 General Circulation of the Atmosphere****Crosslisted with:** METR 415**Prerequisites:** Junior standing; METR 475/875; PHYS 211/211H; and PHYS 221.**Description:** Development of the atmospheric circulation regimes, from planetary scale (e.g., the planetary waves) to synoptic scale (e.g., the cyclones and anticyclones) and mesoscale, their seasonal variations, and their roles in horizontal vertical energy and water transport and budgets in the Earth system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

METR 821 Cloud Physics**Crosslisted with:** METR 421**Prerequisites:** METR 223 and METR 323 or equivalent.**Description:** Buoyancy and parcel mixing, cloud physics instrumentation, the role of aerosols in precipitation processes, growth of liquid cloud droplets/raindrops/ice crystals, processes associated with falling precipitation particles, drop size distributions and their moments, applications to convection, and parameterizations of cloud microphysical processes for numerical modeling applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 823 Physical Meteorology****Prerequisites:** CSCE 150E; METR 205; PHYS 212/212H**Description:** Physical principles that provide the foundation for meteorology. Absorption, scattering, and transmission of radiation in the atmosphere, cloud physics, precipitation process, atmospheric optics, atmospheric electricity, and lightning.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**METR 828 Air Pollution****Crosslisted with:** METR 428**Prerequisites:** 6 hrs. METR and CHEM 109.**Description:** Basic processes (e.g., emission, transport, first-order chemical reaction, and deposition) associated with air pollution and their combination with meteorology for air quality forecasting. Environmental topics: acid rain; smog; air pollution; ozone hole; greenhouse gases; aerosols; long-range transport; civic regulations and international treaties on air pollution; and climate change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 833 Boundary-layer Meteorology****Crosslisted with:** METR 433**Prerequisites:** METR 223 and MATH 208/208H**Description:** Basic concepts of atmospheric turbulence and fundamental dynamics, thermodynamics, and structure of the atmospheric boundary layer are discussed. Atmospheric boundary layer parameterizations used in modern weather and climate models are presented.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 841 Synoptic Meteorology****Prerequisites:** METR 205**Description:** Dynamic and thermodynamic concepts and principles applied to synoptic-scale weather forecasting. Dynamics, energetics, structure, evolution, and motion of extra-tropical cyclones. Meteorological communications, interpretation and analysis of weather maps, and thermodynamic diagrams.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**METR 842 Advanced Synoptic Meteorology-Climatology****Crosslisted with:** METR 442**Prerequisites:** METR 341.**Description:** Analysis and forecasting of subsynoptic-scale weather systems. Convection, thunderstorm models, severe local storm forecasting techniques, mesoscale convective complexes, vertical cross-sections, isentropic analysis, and weather radar.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** METR 944**METR 843 Severe Storms Meteorology-Climatology****Crosslisted with:** METR 443**Prerequisites:** METR 311, METR 341 or parallel**Description:** Dynamics of various types of severe weather (blizzards, flash floods, lightning, thunderstorms and winter and summer tornado outbreaks). Interpretation of the numerical and statistical models utilized to forecast these phenomena. Synoptic case studies of severe weather occurrences. Recent research on severe weather.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 844 Mesoscale Meteorology****Crosslisted with:** METR 444**Prerequisites:** METR 311**Description:** Dynamics and conceptual models of mesoscale meteorological phenomena and processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 850 Climate and Society****Crosslisted with:** AGRO 450, GEOG 450, METR 450, NRES 452, AGRO 850, GEOG 850, NRES 852**Prerequisites:** Junior standing or above.**Notes:** Offered spring semester of even-numbered calendar years.**Description:** Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Groups:** Physical Geography**METR 854 Statistical Analysis of Atmospheric Data****Crosslisted with:** METR 454**Prerequisites:** 6 hrs METR and MATH 107/107H.**Description:** Application of univariate statistics, hypothesis testing, statistical forecasting, forecast verification, time-series analysis, principal component analysis, and cluster/multivariate analysis to atmospheric data for different applications in the atmospheric sciences (from short-term weather forecast to long-term climate prediction).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** METR 965

METR 863 Radar Meteorology**Crosslisted with:** METR 463**Prerequisites:** METR 323.**Description:** The fundamental principles of weather radars and the basic application of these principles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 864 Satellite Meteorology****Crosslisted with:** METR 464**Prerequisites:** METR 223.**Description:** Concepts and principles related to meteorological observations from satellites. Applications for weather analysis and forecasting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 865 Satellite Remote Sensing of Atmosphere****Crosslisted with:** METR 465**Prerequisites:** METR 323**Description:** Principles of atmospheric radiation and techniques for satellite image processing. Application of data calibration, image registration and enhancement, noise filtering and multi-spectral classification of satellite images. Survey of various satellite sensors used for monitoring different atmospheric processes and constituents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 869 Bio-Atmospheric Instrumentation****Crosslisted with:** AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, GEOG 869, HORT 807, MSYM 869, NRES 869**Prerequisites:** Junior standing; MATH 106; 4 hrs physics; physical or biological science major.**Description:** Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Physical Geography**METR 870 The Climate System: Analysis and Prediction****Crosslisted with:** METR 470**Description:** Maintenance of the climate system and climate change over time. Global budgets of energy, water, and momentum and their balance. Development of simple, physically-based models of climate and of climate change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 871 Tropical Meteorology****Crosslisted with:** METR 471**Prerequisites:** METR 223 and METR 311.**Description:** Atmospheric phenomena unique to the tropics, and their connection to the global circulation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 875 Physical Climatology****Crosslisted with:** METR 475**Prerequisites:** METR 205.**Description:** Global energy and water balance regimes of the earth and its atmosphere. Utilization of physical laws to reveal causes and effects of interrelationships in the climatic system.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** METR 483, METR 883, NRES 467, NRES 867**METR 878 Regional Climatology****Crosslisted with:** METR 478, NRES 478, NRES 878**Prerequisites:** NRES/METR 370.**Description:** Regional differentiation of the climates of the earth on both a descriptive and dynamic basis. The chief systems of climatic classification.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 879 Hydroclimatology****Crosslisted with:** NRES 479, METR 479, WATS 479, BSEN 479, NRES 879, BSEN 879**Prerequisites:** NRES 208 or METR 100 or METR/NRES 370.**Notes:** Offered spring semester of even-numbered calendar years.**Description:** Interaction between earth's climate and the hydrologic cycle. Energy and water fluxes at the land-atmosphere interface. Atmospheric moisture transport, precipitation, evaporation, snowmelt, and runoff. Impacts of climate variability and change on the hydrologic cycle.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 880 Theory of Climate****Prerequisites:** MATH 221/821 or MATH 221H; PHYS 142 or equivalent**Description:** Foundation and maintenance of earth's climate system and its variation over time. Climate modeling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

METR 883 Global Climate Change**Crosslisted with:** METR 483, NRES 467, NRES 867**Prerequisites:** Junior standing; and METR 475/875.**Notes:** Offered fall semester of even-numbered calendar years.**Description:** Elements of climate systems, El Nino/La Nina cycle and monsoons, natural variability of climate on interannual and interdecadal scales. Paleoclimate, and future climate, developed climate change scenarios and climate change impacts on natural resources and the environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 887 Earth's Climate: Past, Present, Future****Crosslisted with:** METR 487**Prerequisites:** 6 hrs METR or 6 hrs GEOL.**Description:** How the Earth's climate has varied and the forcing mechanisms related to those changes. Themes that reappear through Earth's climate history and into the future; causes of climate change; the natural response times of the multiple components; and the role of greenhouse gases within the climate system at differing time scales.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 895 Internship in Meteorology-Climatology****Crosslisted with:** METR 495**Prerequisites:** Permission.**Description:** Application of meteorology-climatology learning with on-the-job training.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**METR 898 Special Topics in Meteorology-Climatology****Crosslisted with:** METR 498**Prerequisites:** Permission.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**METR 903 Seminar in Meteorology and Climatology****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 907 Agricultural Climatology****Crosslisted with:** AGRO 907, HORT 907, NRES 907**Prerequisites:** NRES 808; STAT 801A or equivalent**Description:** Offered spring semester of odd-numbered calendar years. Analysis and use of climatological data as applied to agricultural activities and the use of climatological information to assist in decision making.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 908 Research Practicum****Crosslisted with:** LIFE 908**Prerequisites:** Graduate standing.**Description:** A cohort of students from a variety of STEM disciplines will apply concepts in interdisciplinary science collaboration and communication, data analytics, and research methods. This application will occur in a real-world context as students work together to develop and carry out a research project leading to results suitable for publication in the peer-reviewed literature, or to a high-quality proposal suitable for submission to a funding agency. Students will learn about writing and reviewing proposals for funding, and about writing and reviewing manuscripts for the peer-reviewed literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 924 Atmospheric Radiative Transfer****Prerequisites:** METR 423/823; MATH 221/221H/821; and permission**Description:** Theory of scattering by atmospheric particles (e.g., clouds, aerosols, and molecules), atmospheric radiative transfer equations, and techniques for solving these equations. Atmospheric transfer of both solar and terrestrial radiation. Numerical experiments with radiative transfer models and comparison with observations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 933 Land-atmosphere Interactions****Prerequisites:** METR 433/833, or equivalent**Description:** Investigate the physical processes involved in land-atmosphere interactions, focusing on the coupling between land surfaces (especially the soil and vegetation cover) and the atmospheric boundary layer.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 943 Dynamics of Severe Convective Storms****Prerequisites:** METR 411/811 and 412/812, or equivalent**Description:** Advanced concepts related to severe convective storms. Tornado-generation, super-cell formation, rotation, movement, morphology, quasi-linear convective systems, deep convective initiation, hail, mesoscale convective systems, and RKW (Rotunno-Klemp-Weisman) theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**METR 944 Advanced Synoptic Theory and Application****Prerequisites:** METR 842 or equivalent**Description:** Advanced theoretical background in synoptic meteorology, and opportunities to apply these concepts to real-world problems. Topics include the quasi-geostrophic equations, static stability effects, midlatitude cyclones, upper-level waves, frontogenesis, semi-geostrophic theory, potential vorticity, and IPV thinking.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

METR 965 Radar Signal Processing and Applications

Prerequisites: MATH 322/822 or equivalent, METR 454/854 or equivalent, METR 323 or equivalent

Description: Hands-on signal processing experience designed to build understanding of radar signal processing methods and radar data limitations. Topics include propagation of radiation, pulse modulation, application of the radar equations, signal statistics and Fourier methods, advanced methods to gather atmospheric data using radar and radar polarimetry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

METR 987 Seminar in Climatic Change

Description: Climates of the past emphasizing the Quaternary period. Paleogeographic changes in response to climatic fluctuations. Techniques for recording and reconstructing past climatic variations. Modeling the changing climate. Climatic changes and human affairs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Modern Languages (MODL)

MODL 826 Reformation Thought

Crosslisted with: HIST 426, HIST 826, MODL 426, MRST 426, MRST 826, RELG 426, RELG 826

Prerequisites: Junior standing

Description: Life and thought of significant figures and schools of thought in the Reformation period

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Pre-1800 History

MODL 842 Survey of Medieval German Literature in Translation

Crosslisted with: GERM 442, GERM 842, MODL 442

Prerequisites: Permission.

Notes: German majors expected to read the works in German translation and to write their papers in German. Non-German majors read the works in English translation.

Description: Development of German vernacular literature during the Middle Ages. Include works that represent the philosophical/religious literature, the heroic epic, and the romance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MODL 843 Dante and His Times

Crosslisted with: MODL 443

Description: The Divina Commeddia and some minor works; extensive readings in the social background of the thirteenth and fourteenth centuries.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MODL 854 Russian Intellectual Tradition

Crosslisted with: MODL 454, RUSS 454, RUSS 854

Prerequisites: Junior standing.

Description: Major Russian thinkers from 1700 to the present. Focus on the evolution of ideas in the Russian context and the relationship between Russian and European thought.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MODL 870 Introduction to Literary Criticism

Description: Lecture and discussion about important figures and movements in the history of literary criticism. Reading of representative texts to develop a critical lexicon. Bibliographic and methodological component, tailored to needs of modern language students, and required of all graduate students.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MODL 872 Digital Humanities Practicum

Crosslisted with: ENGL 472, ENGL 872, HIST 472, HIST 872, ANTH 471, ANTH 871, MODL 472

Prerequisites: Junior standing.

Description: Provide students with real, in-depth experience in collaboratively creating digital humanities projects. Guided by faculty with expertise in a broad range of digital humanities methods and resources, students work in teams to tackle challenges proposed by UNL researchers and/or local and regional humanities organizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Digital Humanities

MODL 878 Pro-seminar in Latin American Studies

Crosslisted with: ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, GEOG 878, HIST 878, POLS 878, SOCI 878, EDPS 878

Prerequisites: Junior standing and permission.

Notes: Topical seminar required for all Latin American Studies majors.

Description: An interdisciplinary analysis of topical issues in Latin American Studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

Groups: Integrative Courses, Research Regional Geography Lat Am, Asian, Middle East Hist International Relations & Compar

MODL 880 Seminar in Applied Linguistics and Methodology

Description: Theoretical and practical aspects of second language teaching and learning with special emphasis on the application of principles of applied linguistics along with related disciplines of education to structured teaching and learning situations. MODL 880, or its equivalent, is required of all graduate students in modern languages. It does not qualify as a course for Nebraska State Teacher Certification.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MODL 883 Curriculum Design and Language Program Direction**Crosslisted with:** TEAC 883**Description:** Examination of curriculum design and language program direction for foreign/second language learning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MODL 895 Internship in Digital Humanities****Crosslisted with:** ENGL 895E, HIST 895**Description:** Active participation in an ongoing digital humanities project in the Center for Digital Research in the Humanities, including weekly meetings designed to build technical and project management skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MODL 898 Special Topics****Crosslisted with:** MODL 498**Prerequisites:** Permission.**Description:** Consideration of topics in the area of language, literature, and civilization.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**MODL 918 Interdisciplinary Seminar in Nineteenth-Century Studies****Crosslisted with:** ENGL 918, HIST 918**Description:** Invention of the nineteenth century, gender, colonialism, class, realism science and technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**MODL 919 Interdisciplinary Approaches to the Nineteenth Century****Crosslisted with:** ENGL 919, HIST 919**Description:** Introduction to the nineteenth century in North America (focusing on the US), Great Britain, and Europe (focusing on France, Germany, Russia, and Spain), organized through themes such as constructions of gender and sexuality, democracy in the nation-state, and challenges to religion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MODL 946 Interdisciplinary Readings in Digital Humanities****Crosslisted with:** HIST 946, ENGL 946, ANTH 946**Description:** Methods, theories, and practices of digital humanities scholarship.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MODL 988 Introduction to the Interdisciplinary Study of the Middle Ages****Crosslisted with:** AHIS 988, ENGL 988, HIST 988, MUSC 988**Description:** Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Middle Ages. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MODL 989 Introduction to the Interdisciplinary Study of the Renaissance****Crosslisted with:** AHIS 989, ENGL 989, HIST 989, MUSC 989**Description:** Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Renaissance. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Music (MUSC)

MUSC 824 Piano Pedagogy I: Foundations, Philosophies, and Theories**Crosslisted with:** MUSC 424**Prerequisites:** 10 hrs applied piano.**Description:** The history, materials, and methodologies of piano pedagogy from a perspective of wellness promotion. Special issues pertaining to teaching beginning, intermediate, and advanced students. Observation experience and a supervised teaching practicum.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MUSC 425, MUSC 825**Groups:** Music Literature and Pedagogy**MUSC 825 Piano Pedagogy II: Approaches to Studio Teaching****Crosslisted with:** MUSC 425**Prerequisites:** MUSC 424/824.**Description:** Issues pertinent to studio piano teaching, including business issues, developing effective strategies for teaching selected musical and technical skills. Observation experience and a supervised teaching practicum.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MUSC 826**Groups:** Music Literature and Pedagogy

MUSC 826 Piano Pedagogy III: Pedagogical Methods and Literature**Prerequisites:** MUSC 825**Notes:** MUSC 826 requires observation experience and a supervised teaching practicum.**Description:** Teaching methods and literature. Identification of musical/interpretive and technical challenges in literature. Development of strategies for sequencing literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MUSC 827**MUSC 827 Piano Pedagogy IV: Group Teaching and Research and/or Writings****Prerequisites:** MUSC 826**Notes:** MUSC 827 requires observation experience and a supervised teaching practicum.**Description:** Teaching piano in group settings. Relational dynamics and curricular issues. Individual research and writing on selected topic of interest serves as a culminating experience for the piano pedagogy course sequence.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 830J Music and Text in the English Renaissance****Crosslisted with:** ENGL 830J**Prerequisites:** MUSC 366**Description:** Interconnections between musical and literary composition at a time when practitioners in both areas were profoundly influenced by developments in each others' fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 835 Music and Film: History and Analysis****Crosslisted with:** MUSC 435**Prerequisites:** MUSC 366 or THEA 489/889.**Description:** Selected films, composers, scores, and the historical contexts. Historical trends in film and film scoring as well as how those trends are being interpreted by contemporary filmmakers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 836 Introduction to Graduate Studies in Music I****Description:** Music as a field of scholarly inquiry, incorporating basic research tools and techniques.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**MUSC 837 History of Jazz: Origins to Bop****Crosslisted with:** MUSC 437**Prerequisites:** MUSC 366.**Description:** The history of jazz from its musical antecedents in the Nineteenth Century to the birth of modern jazz via Bebop in the 1940s. Important musical artists and trends within the larger context of American history in the Twentieth Century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 838 History of Jazz: Post Bop****Crosslisted with:** MUSC 438**Prerequisites:** MUSC 366.**Description:** The development of modern jazz from the late 1940s to the present. Important artists and trends within the larger context of American history in the Twentieth Century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 839 Music in the Lives of People****Description:** Roles and functions of music among various groups of people. Importance of music in the development of children and young people, specialized meanings of music that distinguish musicians from non-musicians, and a survey of musical cultures from around the world.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 840 Technology Strategies for Teaching Composition****Description:** Process and product of music composition in educational settings. Notation, sequencing, and digital audio software and hardware. Composing and arranging.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 841 Skills for the Church Musician****Crosslisted with:** MUSC 441**Prerequisites:** MUSC 274 and MUAP 232. Keyboard facility recommended.**Description:** Skills and philosophical issues for those providing and organizing music for sacred institutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Literature and Pedagogy

MUSC 842 Great Composers & Performers in Music**Crosslisted with:** MUSC 442**Prerequisites:** MUSC 366 or equivalent.**Description:** Historical and stylistic study of the life and music of one or more important composers and/or performers in the European-American or non-Western musical traditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Music History**MUSC 847 Graduate Review of Music History****Description:** Review of music history for graduate students including examples from all major style periods: Medieval, Renaissance, Baroque, Classical, Romantic, and Contemporary. Enrollment will be required as determined by the results of the Graduate Diagnostic Survey in Music History.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 848 Review of Music Theory****Description:** Review of music theory. Fundamentals, diatonic and/or chromatic harmony, form, and analysis.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 848A Review of Theory Diatonicism****Description:** Introduction to part writing and voice leading.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**MUSC 848B Review of Theory: Chromaticism****Description:** Chromatic theory.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**MUSC 848E Review of Theory: Form****Description:** Sonata and fugue.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**MUSC 849 Medieval Music****Crosslisted with:** MUSC 449**Prerequisites:** MUSC 366.**Description:** Historical and stylistic study of medieval music and its antecedents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 855 Techniques of Counterpoint****Crosslisted with:** MUSC 455**Prerequisites:** MUSC 266.**Description:** Counterpoint from the eighteenth through the twentieth century. Analysis of excerpts from the literature and composition of representative musical examples.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Theory**MUSC 856 Schenkerian Analysis****Description:** Application of the theories of Heinrich Schenker to the analysis of tonal (common practice period) music.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 857 Post-Tonal Theory****Crosslisted with:** MUSC 457**Prerequisites:** MUSC 266.**Description:** Overview of recent techniques for the analysis of twentieth-century music. Evaluation of the theories of Schönberg, Forte, Babbitt, Perle, Lewin, Morris, and others. Application of musical examples.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Theory**MUSC 858 History of the Opera****Crosslisted with:** MUSC 458**Prerequisites:** Senior standing or MUSC 366.**Description:** Literature of the opera from its prehistory and beginnings to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 859 Symphonic Literature****Crosslisted with:** MUSC 459**Prerequisites:** Senior or graduate standing or MUSC 366.**Description:** Literature of the symphony orchestra from the Baroque era to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History

MUSC 860 Musical Form**Crosslisted with:** MUSC 460**Prerequisites:** MUSC 266.**Description:** The formal structure and design in music of the common practice period and the present, smaller structural units, motivic processes, binary and ternary forms, vocal forms, theme and variation, sonata, rondo, concerto, suite, ostinato, and contrapuntal forms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Theory**MUSC 861 Comprehensive Analysis****Crosslisted with:** MUSC 461**Prerequisites:** MUSC 266.**Description:** Analysis of music within historical and stylistic contexts with the goal of informing score study and preparation for performers, conductors, and music educators. Analysis of music from the Renaissance, Baroque, Classical, Romantic, and contemporary eras.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Theory**MUSC 862 Instrumental Literature and Pedagogy****Crosslisted with:** MUSC 462**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862A Instrumental Literature and Pedagogy: Brass/Percussion Instruments****Crosslisted with:** MUSC 462A**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862D Instrumental Literature and Pedagogy: String Instruments****Crosslisted with:** MUSC 462D**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862E Instrumental Literature and Pedagogy: Woodwind Instruments****Crosslisted with:** MUSC 462E**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862I Instrumental Literature and Pedagogy: Violin****Crosslisted with:** MUSC 462I**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862J Instrumental Literature and Pedagogy: Viola****Crosslisted with:** MUSC 462J**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862K Instrumental Literature and Pedagogy: Cello****Crosslisted with:** MUSC 462K**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862L Instrumental Literature and Pedagogy: Double Bass****Crosslisted with:** MUSC 462L**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MUSC 862M Instrumental Literature and Pedagogy: Trumpet**Crosslisted with:** MUSC 462M**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862N Instrumental Literature and Pedagogy: French Horn****Crosslisted with:** MUSC 462N**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862P Instrumental Literature and Pedagogy: Trombone****Crosslisted with:** MUSC 462P**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862Q Instrumental Literature and Pedagogy: Euphonium, Tuba****Crosslisted with:** MUSC 462Q**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862R Instrumental Literature and Pedagogy: Flute****Crosslisted with:** MUSC 462R**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862T Instrumental Literature and Pedagogy: Oboe****Crosslisted with:** MUSC 462T**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862U Instrumental Literature and Pedagogy: Clarinet****Crosslisted with:** MUSC 462U**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862V Instrumental Literature and Pedagogy: Bassoon****Crosslisted with:** MUSC 462V**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862W Instrumental Literature and Pedagogy: Saxophone****Crosslisted with:** MUSC 462W**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862Y Instrumental Literature and Pedagogy: Percussion****Crosslisted with:** MUSC 462Y**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 862Z Instrumental Literature and Pedagogy: Guitar****Crosslisted with:** MUSC 462Z**Description:** Survey of the pedagogy and the solo, chamber and pedagogical literature of instruments from elementary to advanced levels, for class as well as private instruction.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MUSC 865 Jazz Theory

Crosslisted with: MUSC 465

Prerequisites: MUSC 266.

Description: Theoretical foundation of jazz composition and performance. Ear training and keyboard skills.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MUSC 467, MUSC 867

Groups: Music Theory

MUSC 866 Jazz Styles

Crosslisted with: MUSC 466

Prerequisites: MUSC 366 and MUNM 387 or equivalent or permission.

Description: Jazz styles from 1920 to the present, with emphasis on the development of listening skills required to aurally identify improvisors, composer/arrangers and stylistic characteristics within the jazz idiom.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 867 Jazz Improvisation

Crosslisted with: MUSC 467

Prerequisites: MUSC 465/865

Description: Exploration of the uses of the elements of music (melody, harmony, rhythm, articulation, dynamics, form, etc.) in consonant and dissonant ways to create expressive, emotional and substantive improvisations. Topics include the role of the ear; free playing; intervallic and melodic construction; tone and chord character; and transcription.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 868 Jazz Pedagogy

Crosslisted with: MUSC 468

Description: Acquaints student with musical repertoire and rehearsal technique of the school jazz ensemble, the various methods of jazz improvisation instruction, the musical roles of the rhythm section, and the materials (books, audio, and video recordings, etc.) that are available to the jazz teacher.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 869 Organ Design and Construction

Crosslisted with: MUSC 469

Prerequisites: 10 hours of applied organ.

Description: Comparison of the most important methods of designing and constructing organs in Europe and America from 1500 to the present.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 870 Introduction to Vocal Pedagogy

Crosslisted with: MUSC 470

Prerequisites: Junior standing.

Description: The processes of teaching singing, basic physiology, and scientific and acoustical terms. Developing processes to teach breathing, phonation, registration, resonance strategies, and sound concept through discussion and evaluation of practice teaching, and on how to manage a private studio.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: MUSC 971

Groups: Music Literature and Pedagogy

MUSC 871 Art Song I

Crosslisted with: MUSC 471

Prerequisites: Junior standing or above.

Description: Development of the art song, emphasizing the European and New World traditions from the eighteenth century to the present.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 872 Art Song II

Crosslisted with: MUSC 472

Prerequisites: Junior standing.

Description: Intensive study of the German, French and American art song literature from the eighteenth century to the present.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 874 Organ Literature and Pedagogy

Crosslisted with: MUSC 474

Prerequisites: 10 hrs organ or equivalent.

Description: Survey of the most important trends in organ literature and pedagogy from medieval times to the present day. The interrelationships between the music and organ design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 875 Organ Literature Seminar

Crosslisted with: MUSC 475

Prerequisites: 10 hrs organ or equivalent.

Notes: Topics will rotate.

Description: Seminar in specific focus areas of organ literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

Groups: Music Literature and Pedagogy

MUSC 875A German Organ Music to 1800**Crosslisted with:** MUSC 475A**Description:** Seminar in specific focus areas of organ literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 875B Organ Music of France****Crosslisted with:** MUSC 475B**Description:** Seminar in specific focus areas of organ literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 875E Organ Music of America****Crosslisted with:** MUSC 475E**Description:** Seminar in specific focus areas of organ literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 875J ORGAN MUSIC >1950****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 875K Historic Organ Technique****Crosslisted with:** MUSC 475K**Description:** Seminar in specific focus areas of organ literature.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 876 Piano Literature****Crosslisted with:** MUSC 476**Prerequisites:** 12 hrs undergraduate piano.**Description:** Literature for solo piano from the early Baroque through the Twentieth Century, with emphasis on musical styles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Literature and Pedagogy**MUSC 877 Piano Literature Seminar****Crosslisted with:** MUSC 477**Prerequisites:** 12 hrs undergraduate piano.**Notes:** Specific style periods rotate.**Description:** Literature for solo piano.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Literature and Pedagogy**MUSC 877A Piano Literature Seminar - Baroque/Classical****Crosslisted with:** MUSC 477A**Description:** Literature for solo piano.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 877B Piano Literature Seminar - Romantic****Crosslisted with:** MUSC 477B**Description:** Literature for solo piano.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 877D Piano Literature Seminar - Twentieth Century Repertoire****Crosslisted with:** MUSC 477D**Description:** Literature for solo piano.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 878 Music of the Twentieth Century I****Crosslisted with:** MUSC 478**Prerequisites:** MUSC 366 or equivalent.**Description:** Historical and stylistic study of the music composed from the last decade of the nineteenth century through World War II.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music History**MUSC 879 American Composers and the Orchestra****Crosslisted with:** MUSC 479**Prerequisites:** MUSC 266**Description:** Examination of important works for orchestra by American composers from the late 1800s to the present day.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**MUSC 880 Advanced Tonal Theory****Crosslisted with:** MUSC 480**Prerequisites:** MUSC 266.**Description:** Compositional practices of late nineteenth-century European music. Chromatic harmony and devices of tonal and motivic expansion. Analytical concepts of Schenker, Schönberg, and others. Application of music examples.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Theory

MUSC 881 Strategies for Advanced Research in Music

Notes: For DMA and MM option 1A and 1B

Description: Explores the strategies and understanding of scholarly bibliographic and research procedures and standards in music disciplines.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

MUSC 882 Music of the Twentieth Century II

Crosslisted with: MUSC 482

Prerequisites: MUSC 366 or equivalent.

Description: Historical and stylistic study of the music composed since World War II.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 883 Music Technology: Advanced Techniques and Applications

Crosslisted with: MUSC 483

Prerequisites: MUSC 383.

Notes: Presented in a seminar format.

Description: Advance music technology focusing on particular areas of interest such as: MIDI/audio music production; advanced music notation; and software development for audio, multi-media, and/or mobile applications.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

MUSC 884 Music in 20th-Century American Society

Prerequisites: Permission

Description: Twentieth century art and vernacular music in the social and historical contexts of its creation, including issues and repertoires that involve multiculturalism and the relationship between popular and art traditions and genres.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUSC 885 Music of the Classic Period

Crosslisted with: MUSC 485

Prerequisites: MUSC 366 or permission.

Description: Forms, styles, composers, and aesthetics of the classic period.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 886 Music of the Renaissance

Crosslisted with: MUSC 486

Prerequisites: MUSC 366 or permission

Description: Forms, styles, composers, and aesthetics of music of the Renaissance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 887 Music of the Baroque Era

Crosslisted with: MUSC 487

Prerequisites: MUSC 366.

Description: Forms, styles, composers, and aesthetics of the Baroque Era.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 888 Music of the Romantic Period

Crosslisted with: MUSC 488

Prerequisites: MUSC 366.

Description: Forms, styles, composers, and aesthetics of the Romantic Era.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 889 American Music

Crosslisted with: MUSC 489

Prerequisites: MUSC 366 or equivalent.

Description: American music and musical life in its cultivated and vernacular traditions including a consideration of its cultural and social background as well as principal stylistic trends and predominant musical attitudes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music History

MUSC 893 Career Development: Music Entrepreneurship

Crosslisted with: MUSC 493

Description: Covers the practical aspects of a successful music career, including finances, self-presentation, publicity, and marketing for both new and traditional career directions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUSC 894 Music Internship**Crosslisted with:** MUSC 94, MUSC 494**Prerequisites:** Permission.**Description:** Supervised practicum and/or field work in an area related to music under the direction of a university staff/faculty member and a cooperating professional in the particular area(s) of interest.**Credit Hours:** 0**Max credits per semester:****Max credits per degree:****Format:** FLD**Groups:** Independent Study, Seminars**MUSC 898 Special Topics in Music****Crosslisted with:** MUSC 498**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 24**Format:** LEC**Groups:** Independent Study, Seminars**MUSC 898A Special Topics in Music****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**MUSC 898B Special Topics in Music****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 899 Masters Thesis or Original Composition****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**MUSC 941 Theory Pedagogy****Prerequisites:** Permission**Description:** Current materials and approaches for the teaching of music fundamentals, harmony counterpoint, ear training, sight singing, form and analysis. Activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 942 Pedagogy of Music History****Prerequisites:** Permission**Notes:** Oriented to students in music including performance, composition, music education, music theory, and music history.**Description:** Current materials and approaches for the teaching of music history in the post-secondary academic environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 952 Twentieth-Century Church Music****Prerequisites:** MUSC 366 or equivalent**Description:** Recent developments in church music seen in the light of twentieth-century theological trends. New directions in church music.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 969 Diction for Graduate Students****Description:** Lyric diction in English, Italian, ecclesiastical Latin, French, and German.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 971 The Science of Singing****Prerequisites:** MUSC 470/870**Description:** The science of singing. The physiology, functioning, and acoustics of the singing voice. Research in singing and the various applications of scientific concepts. Research in the art of teaching singing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 972 Seminar: Choral Literature****Prerequisites:** Permission**Description:** Designed for the serious conductor. Analytical and stylistic study of choral literature from the beginning of the respective genre. Major works of the ensemble's history and important contemporary works.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**MUSC 972A Choral Literature to 1600****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 972B Choral Literature from 1600 to 1750****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 972D Choral Literature from 1750 to 1900****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

MUSC 972E Choral Literature from 1900 to the present**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 973 Seminar: Orchestral Literature****Prerequisites:** Permission**Description:** Designed for the serious conductor. Analytical and stylistic study of orchestral literature from the beginning of the respective genre. Major works of four distinct historical periods.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**MUSC 973A Orchestral Literature to 1800****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 973B Orchestral Literature from 1800 to 1875****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 973D Orchestral Literature from 1875 to 1910****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 973E Orchestral Literature from 1910 to the present****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 974 Seminar: Wind Band Literature****Prerequisites:** Permission**Description:** Major works and compositional trends of wind band literature. Insights into historical and cultural influences, composers' biographies, analysis of form and style, and correlation with other media (orchestra, choral, etc.).**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**MUSC 974A Wind Band Literature 1892-1952****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 974B Wind Band Literature 1952-Present****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 974D Wind Band Literature The Symphony****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 974E Evolution of Wind Ensemble Instrumentation****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**MUSC 977 Topics in Performance Practice****Description:** Problems of interpretation and execution in music literature with emphasis on examination of literary and musical sources bearing on performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 979 Seminar in Music Theory****Description:** History of music theory, in the works of major theorists, or in special problems in music theory.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**MUSC 986 Seminar in the History and Literature of Music****Description:** Interpretative and historical studies in music; intensive study of special topics in the history and literature of music.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**MUSC 988 Introduction to the Interdisciplinary Study of the Middle Ages****Crosslisted with:** AHIS 988, ENGL 988, HIST 988, MODL 988**Description:** Methods and state of research in the disciplines—art, music, literature, language, history, philosophy—dealing with the Middle Ages. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MUSC 989 Introduction to the Interdisciplinary Study of the Renaissance**Crosslisted with:** AHIS 989, ENGL 989, HIST 989, MODL 989**Description:** Methods and state of research in the disciplines--art, music, literature, language, history, philosophy--dealing with the Renaissance. Assistance in independent reading and research in subjects related to the student's own research interests. Taught jointly by faculty members in art, music, theatre, English, history, classics, modern languages, and philosophy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 995 Graduate Conducting Project****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**MUSC 996 Special Problems****Prerequisites:** Permission**Notes:** obtain adviser's permission to repeat for credit**Description:** Individual research projects in musicology, music theory, or music education.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**MUSC 996A Special Problems****Description:** Individual research projects in musicology, music theory, or music education.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**MUSC 996B Special Problems****Description:** Individual research projects in musicology, music theory, or music education.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**MUSC 997 Doctoral Seminar****Description:** May be repeated for credit.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUSC 999 Doctoral Document****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Music - Applied (MUAP)

MUAP 800A Voice**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 800B Keyboard****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 800D Strings****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 800E Brass****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 800G Woodwind****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 800J Percussion****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** SDO**MUAP 801 Voice****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** SDO**MUAP 802 Piano****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** SDO**MUAP 803 Organ****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** SDO**MUAP 804 Harpsichord****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** SDO

MUAP 805 Violin

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 806 Viola

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 807 Cello

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 808 Double Bass

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 809 Harp

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 810 Trumpet

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 811 French Horn

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 812 Trombone

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 813 Euphonium

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 814 Tuba

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 815 Flute

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 816 Oboe

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 817 Clarinet

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 818 Bassoon

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 819 Saxophone

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 820 Percussion

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: SDO

MUAP 901 Voice

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 902 Piano

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 903 Organ

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 904 Harpsichord

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 905 Violin

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 906 Viola

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 907 Cello

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 908 Double Bass

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 909 Harp

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 910 Trumpet

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 911 French Horn

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 912 Trombone

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 913 Euphonium

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 914 Tuba

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 915 Flute

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 916 Oboe

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 917 Clarinet

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 918 Bassoon

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 919 Saxophone

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 920 Percussion

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

MUAP 921 Choral Conducting**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**MUAP 922 Orchestral Conducting****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 12**Format:** LEC**MUAP 923 Wind Band Conducting****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** SDO**MUAP 924 Guitar****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 999**Format:** SDO**Groups:** Applied Music

Music - Composition (MUCP)

MUCP 810 Film-scoring for Music Majors**Crosslisted with:** MUCP 410**Prerequisites:** Major in Music**Description:** Fundamentals of music composition for visual media will be addressed, including technical and creative aspects for the preparation of distribution-ready music for use in motion pictures. Students will collaborate with producers of original films with no pre-existing music.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**MUCP 860 Computer Programming in Electronic Music****Crosslisted with:** MUCP 460**Description:** Exploration of powerful synthesis, interface, and control capabilities of various software programs with a focus on generating and manipulating audio. This is a hands-on, practical and technical overview of practices relating to the creative use of working with digital audio useful for software-based step-sequencers, synth bass/pads, musical interfaces, and many other tools for digital media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUCP 885 Orchestration****Crosslisted with:** MUCP 485**Notes:** Letter Grade only.**Description:** Exploration of instrumental color and orchestral style, covering idiomatic writing for individual and groups of instruments, traditional and contemporary notational practices, and modern digital applications for score production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**MUCP 886 Jazz Arranging I: Small Ensembles****Crosslisted with:** MUCP 486**Prerequisites:** MUSC 266**Notes:** Fluency in basic jazz theory is strongly recommended.**Description:** Development of basic professional competency in the areas of scoring and music preparation for small jazz ensembles of varying instrumentations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MUCP 487, MUCP 887**MUCP 887 Jazz Arranging II: Large Ensembles****Crosslisted with:** MUCP 487**Prerequisites:** MUCP 486/886, or by permission of instructor**Description:** Development of basic professional competency in the areas of scoring and music preparation for large jazz ensembles of varying instrumentations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUCP 983 Seminar in Music Composition****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC

Music - Ensembles (MUEN)

MUEN 841 All-Collegiate Choir**Notes:** Audition not required. Off-campus performance as approved by the instructor and the Director of the School of Music.**Description:** Standard choral works.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 12**Format:** SDO**Offered:** FALL/SPR

MUEN 843 Varsity Chorus

Notes: Choral ensemble for tenor or bass voices. Audition not required. Off-campus performance as approved by the instructor and the Director of the School of Music.

Description: Rehearsal and performance of tenor and bass choral literature chosen from folk songs, spirituals, Broadway and Cornhusker favorites.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 844 Small Ensemble

Notes: Requires off-campus performances as approved.

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844A String Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844E Brass Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844I Clarinet Choir

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844J Flute Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844L Trombone Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844M Horn Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844P Percussion Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844T Saxophone Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844U New Music Consort

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844V Small Vocal Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844W Tuba/Euphonium Ensemble

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844Y Jazz Small Group

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 844Z Pep Band

Description: Small groups of primarily like instruments organized for supervised and scheduled rehearsals of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: SDO

Offered: FALL/SPR

MUEN 845 The University Singers

Notes: Audition required. Performances on and off campus as approved by the instructor and the Director of the School of Music.

Description: Repertoire from the choral literature of the Renaissance through contemporary periods.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

MUEN 846 University Chorale

Notes: Choral ensemble for soprano and alto voices. No audition required. Off-campus performances as approved by the instructor and the director of the School of Music.

Description: Rehearsal and Performance of soprano and alto choral literature.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 847 Symphony Orchestra

Notes: Audition required. Off-campus performances as approved by the instructor and the Director of the School of Music. May include collaborations with faculty, students, or guest soloists, and with choral ensembles.

Description: Rehearsal and performance of major orchestral works of the eighteenth through the twenty-first centuries.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 848 Bands

Prerequisites: 2.00 GPA

Notes: Audition required, or permission of director of ensemble. Must meet and maintain full-time enrollment status at UNL. May require off-campus travel as approved. For Cornhusker Marching Band, First round auditions must be completed by July 1.

Description: Rehearsal and performance of literature appropriate for various kinds of bands.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 848A Wind Ensemble

Prerequisites: 2.00 GPA

Notes: Audition required, or permission of director of ensemble. Must meet and maintain full-time enrollment status at UNL. May require off-campus travel as approved. For Cornhusker Marching Band. First round auditions must be completed by July 1.

Description: Rehearsal and performance of literature appropriate for various kinds of bands.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

MUEN 848B Symphonic Band

Prerequisites: 2.00 GPA

Notes: Audition required, or permission of director of ensemble. Must meet and maintain full-time enrollment status at UNL. May require off-campus travel as approved. For Cornhusker Marching Band. First round auditions must be completed by July 1.

Description: Rehearsal and performance of literature appropriate for various kinds of bands.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

MUEN 849 Chamber Singers

Notes: Audition required. Off-campus performances as approved by instructor and the Director of the School of Music.

Description: Select vocal ensemble specializing in the rehearsal and performance of vocal chamber music ranging from early music to contemporary literature.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 852 Graduate Chamber Music

Notes: Off-campus performances as approved.

Description: Quartets, trios, duos, and miscellaneous chamber groups organized for supervised and scheduled rehearsals and performances of music appropriate for the ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 853A UNL Jazz Orchestra

Notes: Open by audition or by permission of the Director of Jazz Studies. Auditions are held the weekend before each term. Performances are held on and off campus as approved by the Director of Jazz Studies and the Director of the School of Music.

Description: Jazz instrumental large ensemble.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

MUEN 853B UNL Big Band

Notes: Open by audition or by permission of the Director of Jazz Studies. Auditions are held the weekend before each term. Performances are held on and off campus as approved by the Director of Jazz studies and the Director of the School of Music.

Description: Jazz instrumental large ensemble of standard instrumentation.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

Music - Opera (MUOP)

MUOP 855 Musical Theatre Techniques

Crosslisted with: THEA 455, THEA 855, MUOP 455

Description: Advanced training in the integration of acting, movement, and singing skills for the performance of musical theatre. Training in artistic decision making that generates a character within a musical. Focus on a discipline of preparation and the resulting practice of performance; practical experiences with solos, duets, and ensembles from American Musical Theatre Repertoire.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Opera/Music Theatre Performanc

MUOP 856 Advanced Opera Performance Techniques

Prerequisites: MUOP 356 or audition and permission

Description: Techniques of role development. Advanced opera performance training through the coordination of singing, movement, emotional expression, and characterization.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

MUOP 857 Music Theatre Performance

Prerequisites: Audition and permission

Description: Preparation for and performance of a chorus, minor, or major role in a fully staged Nebraska (Lincoln) Opera Theatre production.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUOP 858 Philharmonia Chamber Orchestra

Crosslisted with: MUOP 358, MUOP 58

Notes: Open by audition or permission of ensemble director.

Description: Rehearsal and performance of chamber orchestral and operatic repertoire of the seventeenth through the twenty-first centuries.

Credit Hours: 1.00

Max credits per semester: 1

Max credits per degree: 12

Format: SDO

Offered: FALL/SPR

Groups: Opera/Music Theatre Performanc

Music Education (MUED)

MUED 832 Beginning Graduate Studies in Music Education

Prerequisites: Undergraduate degree in music education

Description: An introduction to the National Core Arts (Music) Standards and selected library, Internet, and writing style resources necessary for success in music education graduate study.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUED 834 Advanced Instrumental Conducting

Prerequisites: MUSC 376

Description: Extension of basic conducting skills as related to orchestral and band literature; score analysis, keyboard and pitch imagery skills, advanced baton technique, interpretation and expressive conducting. Addresses the art of conducting from the experienced educator's perspective.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUED 836 Psychology and Sociology of Music

Description: Psychological and sociological principles involved in music learning and performance. Musical aspects of human development, motivation, expressive performance, creativity, performance anxiety, emotional response to music listening, and social uses of music.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUED 838 Inclusive Music Education

Description: Function and contribution of music in the education of the handicapped. Methodology and materials to implement an effective music program. Development of musical experiences for exceptional students of all ages. Public Laws 94-142 and 95-561, music Individualized Education Programs, assessments, adaptations of curriculum materials, current methodologies and research.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

MUED 843 Introduction to Research in Music Education**Prerequisites:** Undergraduate degree in music education**Description:** Interpretation and application of research results. Enables student to design, implement, and report research in the classroom.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** MUED 898**MUED 845 Historical and Philosophical Foundations of American Music Education****Crosslisted with:** TEAC 845**Prerequisites:** Undergraduate degree in MUED**Notes:** MUED 845 is required for a graduate degree in music education.**Description:** Historical overview of American music education practices from the Singing School tradition to today. Major philosophical influences in American music education, writings regarding aesthetic education, equity, ethical practice, gender, meaning, and profundity. The writings of Stublely, Reimer, Mark, Gary, Hylton, Richmond and others are considered.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 862 Choral Literature and Conducting for School Ensembles****Prerequisites:** MUSC 374**Description:** Selection and evaluation of choral music for the school ensemble. Curricular concerns, rehearsal and conducting techniques.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 863 Instrumental Literature and Conducting for School Ensembles****Prerequisites:** MUSC 374**Description:** Selection and evaluation of instrumental music for the school ensemble. Curricular concerns, rehearsal and conducting techniques.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 873 Approaches to Middle School General Music****Crosslisted with:** MUED 473, TEAC 873**Prerequisites:** MUED 344.**Description:** For prospective new and experienced general music/middle school teachers. Characteristics of middle school students, materials, methodology, guitar and recorder techniques, and curriculum development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Music Education**MUED 881 Music in Early Childhood Education****Crosslisted with:** TEAC 881**Prerequisites:** MUED 344 or 370**Description:** Prepares the teacher of the young child (3-8 years) in the musical skills, methodology, and materials needed to carry out a successful program of music in the public and private schools, the nursery schools, and day-care centers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 886 Advanced Choral Conducting****Prerequisites:** Permission**Description:** Designed for the practicing choral directors. Conducting techniques for, and score preparation of, Renaissance, Baroque and twentieth-century choral literature.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 890 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**MUED 893 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**MUED 896 Independent Study in Music Education****Crosslisted with:** MUED 496**Prerequisites:** Permission**Description:** Individual, scholarly study designed to enable a student to pursue a selected topic in music education with the direction and guidance of a faculty member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 9**Format:** IND**Groups:** Music Education**MUED 897 Student Teaching****Crosslisted with:** MUED 497**Description:** Supervised teaching experiences in schools with accompanying seminar which focuses on: teacher certification, teacher and students rights and responsibilities, proper conduct of teachers, selected legal aspects of education, methods of communicating with parents and community members, and current issues which impact education. MUED 897 does not apply towards the master of music degree.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** FLD**Groups:** Music Education

MUED 897D Student Teaching - Elementary Music**Crosslisted with:** MUED 497D**Description:** Supervised teaching experiences in schools with accompanying seminar which focuses on: teacher certification, teacher and students rights and responsibilities, proper conduct of teachers, selected legal aspects of education, methods of communicating with parents and community members, and current issues which impact education. MUED 897 does not apply towards the master of music degree.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** FLD**Groups:** Music Education**MUED 897T Student Teaching - Secondary Music****Crosslisted with:** MUED 497T**Description:** Supervised teaching experiences in schools with accompanying seminar which focuses on: teacher certification, teacher and students rights and responsibilities, proper conduct of teachers, selected legal aspects of education, methods of communicating with parents and community members, and current issues which impact education. MUED 897 does not apply towards the master of music degree.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** FLD**Groups:** Music Education**MUED 898 Masters Research Project****Prerequisites:** MUED 843**Description:** Opportunities to design and implement a major research project with the direction and guidance of a faculty member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**MUED 899 Masters Thesis****Prerequisites:** Admission to Master of Music Option I program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**MUED 928 Seminar in the Curriculum and Teaching of Music****Prerequisites:** Undergraduate degree in music education**Description:** Critical evaluation of current literature, yearbooks, research, new developments, and experiments in the curriculum and teaching of general music.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 961 Current Approaches to Elementary Music Education****Crosslisted with:** TEAC 961**Prerequisites:** Teaching experience**Description:** Implementation of current programs, materials, and techniques for the improvement of music instruction in the elementary school.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 980 Quantitative Research Techniques in Music****Prerequisites:** EDPS 859 and Admission to Ph.D. in Music Program**Description:** An in-depth examination of quantitative research designs and statistical techniques, with emphasis on their application to music research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 982 College Teaching in Music****Description:** Competencies and understandings in music curriculum design and development, instructional strategies, and assessment techniques that contribute to being an effective college music instructor. MUED 982 is for graduate students in music who are preparing to teach at the college level.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 987 Seminar in Music Education****Description:** Intensive study of topics in music education.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**MUED 989A Doctoral Seminar: Music Learning and Cognition****Prerequisites:** Admission to Ph.D. in Music Program**Description:** This course is an in-depth study of the cognitive mechanisms underlying the acquisition of musical knowledge and skills. Specific attention is given to the following, in the context of music learning: emotion and expression, self-regulation and metacognition, and sociocognitive development**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

MUED 989B Doctoral Seminar: Philosophy and Policy**Prerequisites:** Admission to the Ph.D. in Music Program**Description:** Philosophy guides choices within the discipline of music education and is informed by pedagogy, research, and perceptions of educators. Policy is the application of solutions and frameworks to solve problems and results from the philosophies of those articulating and defending policy. Both sides of the paradigm will be analyzed and discussed resulting in the identification of problems existing in music education, K-12 schools, higher education, and music in society at large. Solutions will be offered for such problems and policies designed and defended.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 989E Doctoral Seminar: Technology for Teaching, Research & Outreach****Prerequisites:** Admission into the Ph.D. in Music Program.**Description:** Advanced course in music technology presented in a seminar format which focuses on the adoption and adaptation of technology in higher education in the areas of teaching, research, and outreach within the context of music as the discipline.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 989J Doctoral Seminar: Individual Differences in Music Learning****Prerequisites:** Admission to the Ph.D. in Music Program**Description:** This course is an in-depth study of individual differences in music learning and development. Specific attention is given to learner variability in music learning environments in terms of ability/disability, gender, culture, and socioeconomic status. Using the framework of Universal Design for Learning, students are engaged in a process for making music learning concepts accessible in a variety of inclusive environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 989K Doctoral Seminar: Assessment in Music****Prerequisites:** Admission to Ph.D. in Music Program**Description:** An in-depth examination of the purposes, issues, trends and measurement tools of assessment in music in five major areas—aptitude, cognitive musical achievement, musical performance, creativity, and attitude (plus other affective variables) in both historical and contemporary contexts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 989L Doctoral Seminar: Philosophy in Music****Prerequisites:** Admission into PhD in Music Program**Description:** An exploration of (1) central issues that any music philosophy ought to consider, (2) significant philosophical positions championed throughout history, and (3) significant music philosophers and their writings (recent past & present).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**MUED 990 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**MUED 993 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC

Music Ensemble (credit only) (MUCO)

MUCO 840A Accompanying Vocal**Crosslisted with:** MUDC 440A, MUDC 840A, MUCO 440A**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** SDO**Groups:** Music Ensembles for Elective C**MUCO 840B Accompanying Instrumental****Crosslisted with:** MUDC 440B, MUCO 440B, MUDC 840B**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** SDO**Groups:** Music Ensembles for Elective C

Music Ensemble (degree credit) (MUDC)

MUDC 840A Accompanying Vocal**Crosslisted with:** MUDC 440A, MUCO 440A, MUCO 840A**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** SDO**Groups:** Music Ensembles for Elective C**MUDC 840B Accompanying Instrumental****Crosslisted with:** MUDC 440B, MUCO 440B, MUCO 840B**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** SDO**Groups:** Music Ensembles for Elective C

Natural Resources (NRES)

NRES 800 Sampling, Data Management and Visualization

Prerequisites: Graduate standing is required.

Description: Implement best practices for scientific computing. Practice with a scientific workflow from the design of the sampling scheme, through generation of the data in the field or lab, up to the point of analysis. Understand cognitive constraints on visualization. Use modern software tools to produce publication quality data visualizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LAB

NRES 801 Topics in Applied Ecology

Description: A survey of ecological and sociological frameworks used in the applied ecological research. Emphasis on fisheries and wildlife, grasslands, forests, aquatic habitats, and human dimensions of natural resources.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Offered: FALL

NRES 802 Aquatic Insects

Crosslisted with: BIOS 485, BIOS 885, ENTO 402, ENTO 802, NRES 402

Prerequisites: 12 hrs biological sciences.

Description: Biology and ecology of aquatic insects.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L

NRES 802L Identification of Aquatic Insects

Crosslisted with: BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L

Prerequisites: Parallel ENTO 802, NRES 402/802, BIOS 485/885.

Description: Identification of aquatic insects to the family level.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LAB

NRES 803 Ecological Statistics

Crosslisted with: STAT 803

Prerequisites: STAT 801 or equivalent; prior experience with "R" software

Notes: Available online.

Description: Model-based inference for ecological data, generalized linear and additive models, mixed models, survival analysis, multi-model inference and information theoretic model selection, and study design.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 806 Plant Ecophysiology: Theory and Practice

Crosslisted with: AGRO 806, HORT 406, HORT 806, NRES 406, AGRO 406

Prerequisites: Junior standing; 4 hrs ecology; and 4 hrs botany or plant physiology.

Description: Principles of plant physiology which underlie the relationship between plants and their physical, chemical and biotic environments. An introduction to the ecological niche, limiting factors and adaptation. An overview of the seed germination and ecology, plant and soil water relations, nutrients, plant energy budgets, photosynthesis, carbon balance and plant-animal interactions. An introduction to various field equipment used in ecophysiological studies.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 807 Plant-Water Relations

Crosslisted with: AGRO 807

Prerequisites: AGRO 325 or equivalent; MATH 106 recommended

Description: Quantitative study of water relations in the soil-plant-atmosphere system. Basic physical processes, which describe the movement of water in the soil and the atmosphere, and the physiological processes, which describe water movement inside of the plant. Stomata physiology and the effects of internal water deficits on photosynthesis, respiration, nitrogen metabolism, cell division and cell enlargement. Results from integrative models used to study the relative importance of environmental versus physiological factors for several plant-environment systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

NRES 808 Microclimate: The Biological Environment

Crosslisted with: AGRO 408, GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, AGRO 808, GEOG 808, HORT 808, METR 808

Prerequisites: Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering.

Description: Physical factors that create the biological environment.

Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGRO 907, HORT 907, METR 907, NRES 907; BSEN 954, NRES 954

Groups: Physical Geography

NRES 809 Laboratory Earth: Earth and Its Systems

Description: The earth as a system and the "real world" applications of fundamental physical science processes in this system. Interaction of energy and matter in the geosphere, in the hydrosphere, and in the atmosphere. The earth's relationships to the sun, moon, and other astronomical objects in the solar system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 810 Landscape Ecology

Crosslisted with: HORT 812

Prerequisites: 12 hrs biological sciences or related fields including BIOS 320

Description: Spatial arrangements of ecosystems, the interaction among component ecosystems through the flow of energy, materials and organisms, and alteration of this structure through natural or anthropogenic forces.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 811 Plant Tissue Culture

Crosslisted with: BIOS 811, HORT 811

Description: Survey of techniques used in plant cell, tissue and organ culture, including current research. Laboratory emphasizes practical manipulation of plant cells, tissues, and organs, including examples from woody and herbaceous plant species.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 812 Introduction to Geographic Information Systems

Crosslisted with: GEOG 412, GEOG 812, NRES 412

Description: Introduction to conceptual foundations and applications of computer-based geographic information systems (GIS). GIS database development, spatial data analysis, spatial modeling, GIS implementation and administration.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: GEOG 432, GEOG 832; GEOG 922, NRES 922

Groups: Techniques

NRES 813 Environmental Leadership

Crosslisted with: ALEC 410, ALEC 810, NRES 413

Prerequisites: Junior standing.

Notes: Offered on the World Wide Web (WWW) fall semester of odd-numbered years and in the classroom fall semester of even numbered-years.

Description: Major leaders in conservation and ecology that emphasizes agricultural and cultural issues and relationships with the environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 814 Laboratory Earth: Earth's Natural Resource Systems

Description: Fundamental concepts in the Earth and physical sciences in the understanding of Earth's natural resource systems. Rock and mineral, water, soil, and energy resources. Social factors, human dependence, and the impact of these on natural resource systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 817 Agroforestry Systems in Sustainable Agriculture

Crosslisted with: HORT 418, HORT 818, NRES 417

Prerequisites: 12 hours biological or agricultural sciences.

Description: The roles of woody plants in sustainable agricultural systems of temperate regions. Emphasis on the ecological and economic benefits of trees and shrubs in the agricultural landscape. Topics include: habitat diversity and biological control; shelterbelts structure, function, benefits and design; intercropping systems; silvopastoral systems; riparian systems; and production of timber and specialty crops. Comparison of temperate agroforestry systems to those of tropical areas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 818 Introduction to Remote Sensing

Crosslisted with: GEOG 418, GEOG 818, NRES 418

Prerequisites: 9 hours of GEOL, NRES or GEOG.

Notes: Advanced standing in geography, natural resources, environmental sciences, engineering or agronomy recommended.

Description: Introduction to remote sensing of the earth from aerial and satellite platforms. Aerial photography, multispectral scanning, thermal imaging and microwave remote sensing techniques. Physical foundations of remote sensing using electromagnetic energy, energy-matter interactions, techniques employed in data acquisition and methods of image analysis. Weekly laboratory provides practical experience in visual and digital interpretation of aerial photography, satellite imagery, thermal and radar imagery. Applications in geographic, agricultural, environmental and natural resources analyses.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: GEOG 421, GEOG 821, NRES 421, NRES 821

Groups: Techniques

NRES 819 Chemistry of Natural Waters

Crosslisted with: GEOL 418, GEOL 818, NRES 419, WATS 418

Prerequisites: CHEM 109 and 110, 113 and 114, or CHEM 111.

Description: Principles of water chemistry and their use in precipitation, surface water, and groundwater studies. Groundwater applications used to determine the time and source of groundwater recharge, estimate groundwater residence time, identify aquifer mineralogy, examine the degree of mixing between waters of various sources and evaluate what types of biological and chemical processes have occurred during the water's journey through the aquifer system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: GEOL 418L, GEOL 818L, NRES 419L, NRES 819L, WATS 418L; GEOL 917, NRES 917

NRES 819L Chemistry of Natural Waters Laboratory**Crosslisted with:** GEOL 418L, GEOL 818L, NRES 419L, WATS 418L**Prerequisites:** CHEM 109 and 110 or CHEM 113 and 114; GEOL 418 or parallel.**Description:** Basic laboratory techniques used to perform water analysis including various wet chemical techniques, instrument use (AA, IC, UV-Visible) and computer modeling. Techniques for sample collection and preservation, parameter estimation and chemical analysis.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**NRES 820 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** AGRO 419, GEOG 419, GEOL 419, NRES 420, AGRO 819, GEOG 819, GEOL 819**Notes:** GEOG 418/NRES 418 recommended**Description:** Introduction to the practical uses of remote electromagnetic sensing in dealing with agricultural and water-resources issues.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** Techniques**NRES 821 Field Techniques in Remote Sensing****Crosslisted with:** GEOG 421, GEOG 821, NRES 421**Prerequisites:** NRES 418/818**Description:** Field techniques as they relate to remote-sensing campaigns. Research methods, systematic approaches to data collection, field spectroscopy, collecting ancillary information linked with spectroscopic data sets as well as aircraft or satellite missions and subsequent analyses of acquired data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Techniques**NRES 822 Laboratory Earth: Earth's Changing Systems****Crosslisted with:** NRES 422**Description:** Fundamental concepts related to understanding Earth's changing natural systems in the past, present, and the future. The cycling of matter and energy; the relationship between human activity and environmental change; and the consequence of these relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 823 Integrated Resources Management****Crosslisted with:** NRES 423**Prerequisites:** Natural resource science or related major**Description:** Integrated and multiple-use management. Economic, political, social, and physical impacts on natural resources management priorities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 824 Forest Ecology****Crosslisted with:** NRES 424**Prerequisites:** NRES 220 or BIOS 207**Description:** The structure and function of forest ecosystems including their response to global change; emphasis on forest succession and disturbance regimes in order to understand the dynamics of forested landscapes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**NRES 825 Geostatistics****Crosslisted with:** GEOL 825**Prerequisites:** MATH 106 and STAT 218**Notes:** Offered fall semester of odd-numbered calendar years.**Description:** Practical methods for solving spatial interpolation and related estimation problems with emphasis on geostatistical methods. Introduction to applied statistical simulation and prediction in geology, hydrogeology and environmental studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 826 Invasive Plants****Crosslisted with:** AGRO 426, AGRO 826, HORT 426, HORT 826, NRES 426**Prerequisites:** AGRO/HORT/SOIL 153; BIOS 109.**Description:** Identification, biology and ecology of weedy and invasive plants. Principles of invasive plant management by preventative, cultural, biological, mechanical and chemical means using an adaptive management framework. Herbicide terminology and classification, plant-herbicide and soil-herbicide interactions, equipment calibration and dosage calculations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 827 Introduction to the Global Positioning System (GPS)****Crosslisted with:** GEOG 427, GEOG 827, NRES 427**Prerequisites:** Junior standing.**Notes:** Familiarity with mapping and GIS recommended.**Description:** Integrated lectures, lab exercises and field experience provide an understanding of GPS technology and applications. Students will learn to collect, correct and use GPS data in a geographic information system (GIS) environment.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**NRES 828 Leadership in Public Organizations****Crosslisted with:** ALEC 428, ALEC 828, NRES 428**Prerequisites:** Junior standing.**Description:** Leadership in theories, research, and practices in public organizations and natural resource agencies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NRES 829 Human Dimensions of Natural Resource Management

Description: Introduction to, and understanding of, human dimensions of natural resource management. Interdisciplinary theories and frameworks for understanding and addressing natural resources management will be examined. Historical, psychological, cultural, and social influences will be reviewed. Integrative approaches to sustainable ecosystem management will also be explored.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 829A Food Security: A Global Perspective

Crosslisted with: ANTH 429A, ANTH 829A, AGRO 429A, AGRO 829A, HORT 429A, HORT 829A, NRES 429A, NUTR 429A, NUTR 829A

Prerequisites: Junior standing.

Description: Overview of the technical and sociocultural dimensions of global food insecurity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 830 Laboratory Earth: Climate Research Applications

Description: Climate-change issues serve as a context to develop research questions and design a discrete, locally oriented research project through which they define a problem, analyze data, and develop conclusions to potentially impact decision-making in their community. Designed for science educators. NRES 830 is offered fall semesters.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 831 Waterfowl Ecology and Management

Crosslisted with: NRES 431

Prerequisites: NRES 311.

Description: Ecology and identification of North American waterfowl, management of habitats and populations, and current management issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 832 Laboratory Earth: Human Dimensions of Climate Change

Description: Examine science behind global climate change. Use primary data sets to understand the implications for climate change at global and regional/local scales. Focus on potential impacts on human systems including drought, sea level rise, severe weather and populations most likely to be impacted by climate change. Designed for science educators. NRES 832 is offered spring semesters.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 833 Wildlife Management Techniques

Crosslisted with: NRES 433

Prerequisites: NRES 311.

Description: Survey of methods used to obtain data and make decisions for wildlife management. Scientific methods for wildlife science; monitoring and surveys; construction of management plans; habitat use, classification, and management; harvest management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 834 Environmental Education and Interpretation

Crosslisted with: NRES 434, ENVR 434

Notes: Requires 20 hours of service.

Description: Examination of formal and informal environmental education and interpretation. Knowledge, application and practice relevant to science teachers and park, extension, museums, and zoo educators.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 835 Agroecology

Crosslisted with: AGRO 435, AGRO 835, HORT 435, NRES 435

Prerequisites: For AGRO/HORT/NRES 435: Senior standing. For AGRO/NRES 835: 12 hrs biological or agricultural sciences.

Description: Integration of principles of ecology, plant and animal sciences, crop protection, and rural landscape planning and management for sustainable agriculture. Includes natural and cultivated ecosystems, population and community ecology, nutrient cycling, pest management, hydrologic cycles, cropping and grazing systems, landscape ecology, biodiversity, and socioeconomic evaluation of systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 836 Evolution of Cenozoic Mammals

Crosslisted with: GEOL 436, GEOL 836, NRES 436

Prerequisites: GEOL 103.

Description: Survey of mammalian evolution with emphasis on the origin, radiation, and phylogenetic relationships of Cenozoic fossil mammals. Overview of climatic and ecological changes affecting mammalian adaptations and hands on experience with specimens.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 837 Adaptive Natural Resource Management

Description: From cultural taboos to the current socio-ecological framework, the art and science of natural resource management has and continues to evolve. The primary focus of this course is to introduce students to the concepts of structured decision making and adaptive management, but in doing so the course will explore the history of natural resource management and the various management paradigms that have and continue to dominate resource management. At the completion of this course students will have an understanding of the theory and practice of adaptive management as well as an understanding of why we continue to move toward a more transparent and scientific methodology of natural resource management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LAB

NRES 838 Grassland Conservation: Planning and Management

Crosslisted with: NRES 438

Prerequisites: Introductory soils and introductory ecology.

Description: Apply fundamental grassland ecology principles to grassland conservation and identify grassland establishment and management practices appropriate for different environmental and cultural situations. Based on field study, critically analyze management options and outcomes for several grasslands and develop a management plan for a grassland resource.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 840 Great Plains Ecosystem

Crosslisted with: AGRO 440, AGRO 840, RNGE 440, NRES 440

Prerequisites: Junior standing.

Notes: BIOS 101 and 101L, or equivalent, recommended.

Description: Characteristics of Great Plains ecosystems, interrelationships of ecological factors and processes, and their application in the management of grasslands. Interactions of fire, vegetation, grazing animals and wildlife.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 841 STEM Education Seminar

Crosslisted with: GEOS 811

Prerequisites: Graduate student in a science, technology, engineering, or mathematics (STEM) discipline.

Notes: This seminar is designed for graduate students interested in STEM education in formal or informal environments with children or adult learners.

Description: Acquire familiarity with the broad range of current STEM education research, outreach, and other activities taking place at UNL and across the nation in order to build a larger context for and connections to one's own STEM research and activities.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: RCT

NRES 842 Wildland Plants

Crosslisted with: AGRO 442, AGRO 842, RNGE 442, NRES 442

Prerequisites: Junior standing.

Notes: BIOS 101 and 101L, or equivalent, recommended.

Description: Wildland plants that are important to grassland and shrubland ecosystem management and production. Distribution, utilization, classification, identification (including identification by vegetative parts), uses by Native Americans, and recognition of grasses, fords, shrubs, exotic and wetland plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 844 Ecosystem Monitoring and Assessment

Crosslisted with: AGRO 444, AGRO 844, RNGE 444, NRES 444

Prerequisites: Junior standing.

Notes: NRES 220 or equivalent, recommended.

Description: Measurement and monitoring of the important vegetation and environmental factors used to develop management guidelines in grasslands, savannas, woodlands, and wetlands. Emphasis on using ecosystem monitoring protocols for assessment of wildlife habitat, fuels management for wild-land fire, livestock production, and watershed function. Requires field sampling and travel to local field sites.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 845 Human Remains in Forensic Science

Crosslisted with: FORS 445, FORS 845, NRES 445

Prerequisites: LIFE 120/L and LIFE 121/L, CHEM 109, CHEM 110, and FORS 120/L.

Description: Forensic anthropology within the broader context of forensic sciences and physical anthropology. Decomposition and bone modification through artificial means. Determination of individual identity, diet, chronic pathology and cause of death from human remains.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: FALL

NRES 846 Pollen Analysis for Behavioral, Biological and Forensic Science

Crosslisted with: FORS 446, FORS 846, NRES 446

Prerequisites: BIOS 109 and FORS 120.

Description: Collection, processing, identification of common North American pollen types. Pollination ecology relating to scene reconstruction. Fundamental statistics and presentation requirements for a legal and scientific audience.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: FALL

NRES 847 Archaeoparasitology: The Archaeology of Disease**Crosslisted with:** NRES 447**Description:** Study of parasites, their hosts, and the relationship between them. Human parasitology is especially interesting due to the adaptation of human populations to a great variety of parasites over long periods of time in the global diversity of environments. Fundamental understanding of human-parasite relations and methods of recovery of parasites from a variety of archaeological remains.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**NRES 848 Advanced Topics in Wildlife Damage Management****Crosslisted with:** NRES 448**Prerequisites:** NRES 348**Description:** Economic, global, and public policy issues relative to situations in which wildlife damage personal property or natural resources, threaten human health and safety, or are a nuisance. Demonstration and discussion of technological advances in fertility control, damage resistance, toxicology, behavioral modification, and biological management.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**NRES 849 Woody Plant Growth and Development****Crosslisted with:** BIOS 849, HORT 849**Prerequisites:** CHEM 251 and AGRO 325**Description:** Plant growth and development specifically of woody plants as viewed from an applied whole-plant physiological level. Plant growth regulators, structure and secondary growth characteristics of woody plants, juvenility, senescence, abscission and dormancy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 850 Biology of Wildlife Populations****Crosslisted with:** BIOS 450, BIOS 850, NRES 450**Prerequisites:** NRES 311; MATH 104 or above; STAT 218 or equivalent**Description:** Principles of population dynamics. Management strategies (for consumptive and nonconsumptive fish and wildlife species) presented utilizing principles developed.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**NRES 851 Soils, Water, and Environmental Chemistry****Crosslisted with:** ENVE 851, NRES 451**Prerequisites:** NRES/WATS/SOIL/AGRO/GEOL 361 or graduate standing**Description:** Environmental chemistry related to the fate and transport of organic contaminants in soil-water environments. Application of computer simulation models (i.e., MODFLOW) for predicting contaminant fate in aquifers. Basic chemical and biological principles of remediating contaminated soil and water.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Offered:** SPRING**NRES 852 Climate and Society****Crosslisted with:** AGRO 450, GEOG 450, METR 450, NRES 452, AGRO 850, GEOG 850, METR 850**Prerequisites:** Junior standing or above.**Notes:** Offered spring semester of even-numbered calendar years.**Description:** Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Groups:** Physical Geography**NRES 853 Hydrology****Crosslisted with:** NRES 453**Prerequisites:** MATH 106**Notes:** Not available for credit for engineering students and not a substitute for CIVE 456.**Description:** Introduction to the principles of hydrology, with emphasis on the components of the hydrologic cycle: precipitation, evaporation, groundwater flow, surface runoff, infiltration, precipitation runoff relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 957, BSEN 957, CIVE 957, GEOL 957**NRES 854 Ecological Interactions****Crosslisted with:** BIOS 454, BIOS 854, NRES 454**Prerequisites:** LIFE 121; LIFE 121L; BIOS 207 or NRES 220; Senior Standing**Description:** Nature and characteristics of populations and communities. Interactions within and between populations in community structure and dynamics. Direct and indirect interactions and ecological processes, competition, predation, parasitism, herbivory, and pollination. Structure, functioning and persistence of natural communities, foodweb dynamics, succession, and biodiversity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NRES 855 Soil Chemistry and Mineralogy**Crosslisted with:** AGRO 455, AGRO 855, NRES 455, SOIL 455**Prerequisites:** AGRO/HORT/SOIL 153 or GEOL 101; CHEM 109 and 110; CHEM 221 or 251; or equivalent.**Description:** Chemical and mineralogical properties of soil components. Inorganic colloidal fraction. Structures of soil minerals as a means of understanding properties, such as ion exchange and equilibria; release and supply of nutrient and toxic materials; and soil acidity and alkalinity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 856 Mathematical Models in Biology****Crosslisted with:** BIOS 456, BIOS 856, NRES 456**Prerequisites:** LIFE 120; LIFE 120L; LIFE 121; LIFE 121L; MATH 107**Description:** Biological systems, from molecules to ecosystems, are analyzed using mathematical techniques. Strengths and weaknesses of mathematical approaches to biological questions. Brief review of college level math; introduction to modeling; oscillating systems in biology; randomness in biology; review of historically important and currently popular models in biology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 857 Green Space and Urban Forestry Management****Crosslisted with:** NRES 457, HORT 457**Prerequisites:** Junior or senior standing, Graduate student.**Description:** A focus on the management of trees, parks, and green infrastructure in rural and urban communities. Perspectives from community planning, landscape architecture, urban forestry, natural resources, horticulture, and environmental policy. Development and implementation of green space and forest management plans encompassing societal needs and biological limitations in rural and urban communities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**NRES 858 Soil Physical Determinations****Crosslisted with:** AGRO 458, AGRO 858, NRES 458, SOIL 458**Prerequisites:** SOIL/AGRO/GEOL/WATS 361; PHYS 141 or equivalent; MATH 102 or 103.**Description:** Survey of measurement techniques and principles used in characterizing the physical properties of soils. Includes analysis of experimental design and sources of experimental error. Techniques include: particle size analysis, soil water content, pore size analysis, field sampling techniques, soil strength, and saturated hydraulic conductivity.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LAB**NRES 859 Limnology****Crosslisted with:** BIOS 459, BIOS 859, NRES 459, WATS 459**Prerequisites:** 12 hrs BIOS, including BIOS/NRES 220/BIOS220x; two semesters CHEM.**Description:** Physical, chemical, and biological processes that occur in fresh water. Organisms occurring in fresh water and their ecology; biological productivity of water and its causative factors; eutrophication and its effects.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Prerequisite for:** BIOS 866, NRES 866**NRES 860 Soil Microbiology****Crosslisted with:** AGRO 460, BIOS 460, NRES 460, SOIL 460, AGRO 860, BIOS 860**Prerequisites:** One semester microbiology; one semester biochemistry or organic chemistry.**Description:** Soil from a microbe's perspective-growth, activity and survival strategies; principles governing methods to study microorganisms and biochemical processes in soil; mechanisms controlling organic matter cycling and stabilization with reference to C, N, S, and P; microbial interactions with plants and animals; and agronomic and environmental applications of soil microorganisms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**NRES 861 Soil Physics****Crosslisted with:** AGRO 461, GEOL 461, NRES 461, SOIL 461, WATS 461, AGRO 861, GEOL 861**Prerequisites:** AGRO/SOIL 153; PHYS 141 or equivalent, one semester of calculus.**Description:** Principles of soil physics. Movement of water, air, heat, and solutes in soils. Water retention and movement, including infiltration and field water regime. Movement of chemicals in soils.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** AGEN 955, AGRO 955, CIVE 955, GEOL 985**NRES 862 Conservation Biology****Crosslisted with:** NRES 462**Prerequisites:** 12 hours of biological sciences, including NRES 220 and NRES 222 or equivalent.**Description:** Current issues in conservation biology. Theoretical principles from the areas of ecology and genetics to effectively preserve and manage biological diversity and small populations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NRES 863 Fisheries Science**Crosslisted with:** NRES 463**Description:** Fisheries biology emphasizing the determination and evaluation of vital statistics for the management of fish populations. Basis of specific management techniques. May also be offered at Cedar Point Biological Station.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NRES 871; NRES 965**NRES 863L Fisheries Science Lab****Crosslisted with:** NRES 463L**Description:** Field and laboratory skills needed for fisheries biology emphasizing the determination and evaluation of vital statistics for the management of fish populations. Applied data collection and fish sampling techniques will be used. May also be offered at Cedar Point Biological Station.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**NRES 864 Fisheries Biology****Crosslisted with:** BIOS 464, BIOS 864, NRES 464**Prerequisites:** BIOS/NRES 489/889 or equivalent.**Description:** Biology of fishes. Factors that affect fishes in the natural environment. Techniques used in the analysis and management of fish populations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 865 Soil Geomorphology and Paleopedology****Crosslisted with:** GEOL 465, GEOL 865, NRES 465**Prerequisites:** GEOL 450/850 and NRES 477/877**Description:** Soils and paleosols as evidence in reconstruction landscape evolution and paleoenvironments. Role of paleosols in stratigraphy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 866 Advanced Limnology****Crosslisted with:** BIOS 866**Prerequisites:** NRES 859 or equivalent**Description:** In-depth consideration of selected areas of limnology including stream limnology, primary production, secondary production, nutrient cycling, and eutrophication.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 867 Global Climate Change****Crosslisted with:** METR 483, METR 883, NRES 467**Prerequisites:** Junior standing; and METR 475/875.**Notes:** Offered fall semester of even-numbered calendar years.**Description:** Elements of climate systems, El Nino/La Nina cycle and monsoons, natural variability of climate on interannual and interdecadal scales. Paleoclimate, and future climate, developed climate change scenarios and climate change impacts on natural resources and the environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 868 Wetlands****Crosslisted with:** BIOS 458, NRES 468, WATS 468, BSEN 468, BSEN 868**Prerequisites:** 12 hrs biological sciences; BIOS 220; CHEM 109 and 110.**Notes:** Offered even-numbered calendar years.**Description:** Physical, chemical and biological processes that occur in wetlands; the hydrology and soils of wetland systems; organisms occurring in wetlands and their ecology wetland creation, delineation, management and ecotoxicology.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**NRES 869 Bio-Atmospheric Instrumentation****Crosslisted with:** AGRO 469, GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, GEOG 869, HORT 807, METR 869, MSYM 869**Prerequisites:** Junior standing; MATH 106; 4 hrs physics; physical or biological science major.**Description:** Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Physical Geography**NRES 870 Lake and Reservoir Restoration****Prerequisites:** 12 hrs NRES or related fields**Description:** Theory, processes, and mechanisms underlying lake and reservoir water quality degradation and/or pollution. Remediation of eutrophication and its effects. Current techniques used to restore and protect degraded lakes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NRES 871 Quantitative Fishery Assessment

Prerequisites: STAT 218 or equivalent; NRES 463/863 or equivalent; BIOS/NRES 489/889 or equivalent

Notes: Offered spring semester of even-numbered calendar years.

Description: Advanced quantitative techniques of fishery science required to support management practices targeted at populations (recruitment, growth and mortality), communities (e.g., predator-prey interactions) and ecosystems e.g., bio-stressors).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 872 Applied Soil Physics

Crosslisted with: AGRO 472, AGRO 872, NRES 472, SOIL 472, WATS 472

Prerequisites: AGRO/HORT/SOIL 153 or equivalent; MATH 104 or MATH 106 or equivalent.

Description: Emphasis on applied soil physics. Discussion of theoretical principles followed by field and laboratory exercises and applications. Fluxes of water, solutes, air, and heat through the soil. Emphasis on water infiltration, water retention, other soil hydraulic properties. Components of soil water balance. Management of soil water.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 873 Ecological Anthropology

Crosslisted with: ANTH 473, ANTH 873

Description: Human adaptive systems and their ecological contexts. The dynamic inter-relationships between subsistence, technology, social behavior, human demography, and ecological variability.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Cultural Anthropology

NRES 874 Herpetology

Crosslisted with: BIOS 474, BIOS 874, NRES 474

Prerequisites: BIOS/NRES 386 and permission.

Notes: BIOS 388 recommended.

Description: Fossil and living amphibians and reptiles. Anatomy, classification, ecology and evolution.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 875 Water Quality Strategy

Crosslisted with: NRES 475, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475, POLS 875

Prerequisites: Senior standing.

Notes: Capstone course.

Description: Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: American Government&Public Pol

NRES 876 Mammalogy

Crosslisted with: BIOS 476, BIOS 876, NRES 476

Prerequisites: 8 hrs BIOS; BIOS/NRES 386 or NRES 311.

Notes: May also be offered at Cedar Point Biological Station. Field trips are required and may occur outside of scheduled class time. Lab and field time emphasize diversity of mammalian families and species identification of Nebraska mammals.

Description: Evolution, natural history, ecology, and functional morphology of planetary mammals and mammals of the Northern Great Plains.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 877 Great Plains Field Pedology

Crosslisted with: AGRO 477, GEOG 467, NRES 477, SOIL 477, GEOG 867

Prerequisites: AGRO/SOIL 153.

Description: Spatial relationship of soil properties on various parts of landscape typical of the Plains, causal factors, and predictions of such relationships on other landscapes. Grouping these properties into classes, naming the classes, and the taxonomy that results from this grouping. Application of a taxonomy to a real situation through making a field soil survey in a region representative of the Plains border, predicting land use response of various mapped units as it affects the ecosystem, and evaluating the effectiveness of the taxonomic system used in the region surveyed.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Groups: Physical Geography

NRES 878 Regional Climatology

Crosslisted with: METR 478, METR 878, NRES 478

Prerequisites: NRES/METR 370.

Description: Regional differentiation of the climates of the earth on both a descriptive and dynamic basis. The chief systems of climatic classification.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 879 Hydroclimatology

Crosslisted with: NRES 479, METR 479, WATS 479, BSEN 479, METR 879, BSEN 879

Prerequisites: NRES 208 or METR 100 or METR/NRES 370.

Notes: Offered spring semester of even-numbered calendar years.

Description: Interaction between earth's climate and the hydrologic cycle. Energy and water fluxes at the land-atmosphere interface. Atmospheric moisture transport, precipitation, evaporation, snowmelt, and runoff. Impacts of climate variability and change on the hydrologic cycle.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 880 Vertebrate Population Analysis

Prerequisites: 12 hrs. of biological sciences, MATH 104 or 106

Notes: NRES 880 is offered spring semester of even years.

Description: Introduction to the estimation of demographic parameters from surveys and mark-recapture data. Emphasizes analytical skills used to estimate population vital rates, such as abundance, density, population size, survival rates, home range size, and movement rates. Reinforces use of multiple hypotheses in scientific investigations, as well as model selection processes.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

NRES 881 Environmental Conflict Management

Description: This two-day short-course is designed to aid students development of theoretically grounded practical approaches to facilitate and manage environmental conflict. The course will provide students with skills to perform well in conflict situations and help students manage conflict in diverse environmental contexts. The program blends presentations, group discussions, conflict analysis, and strategy design exercises and simulations into a highly engaging learning environment. Participants learn from each other and develop personalized tools that can be applied immediately. wo-day short-course taught fall semester of even numbered years.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

NRES 882 Ecophysiology of Wildlife

Crosslisted with: NRES 482

Prerequisites: NRES 220 or BIOS 207; AGRO 215/BIOS 206; BIOS 386

Description: Evaluation of the conserved physiological principles that are broadly used across animal groups, as well as the many unique adaptations used by specific taxa. Focuses on all major vertebrate groups, including fish, birds, mammals, reptiles and amphibians, and links the physiological mechanisms that allow them to survive to the environments in which they live. Highlights methods scientists use to gather physiological information, and the ways in this information can be used by scientists in a variety of different fields.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 883 Ecological Economics

Crosslisted with: AECN 883, CDEV 883

Prerequisites: AECN 141 or ECON 212 or equivalent

Description: A synthesis across the notion of "utility" as represented in traditional environmental and natural resource economics, "ecology" in ecological economics, and "community" in behavioral economics. Ideas from thermodynamics with a focus on renewable resources. Development, organization, and enhancement of eco-business, eco-industry, eco-government and eco-communities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 884 Water Resources Seminar

Crosslisted with: AGRO 484, GEOG 484, GEOL 484, NRES 484, WATS 484, AGRO 884, GEOG 884, GEOL 884, WATS 884

Prerequisites: Junior or above standing.

Description: Seminar on current water resources research and issues in Nebraska and the region.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

NRES 887 Hydrogeology

Crosslisted with: GEOL 889

Prerequisites: GEOL 888/NRES 488 and MATH 208

Description: Principles of flow through porous media with emphasis on basic classical solutions, flow-net analysis, and elementary modern numerical solutions that aid in the analysis and development of groundwater supplies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NRES 918

NRES 888 Groundwater Geology

Crosslisted with: GEOL 488, GEOL 888, NRES 488

Prerequisites: GEOL 100-level course; MATH 106 or equivalent.

Description: Occurrence, movement, and development of water in the geologic environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: AGEN 955, AGRO 955, CIVE 955, GEOL 985; GEOL 889, NRES 887; NRES 918

NRES 889 Ichthyology

Crosslisted with: BIOS 489, BIOS 889, NRES 489

Prerequisites: LIFE 120 and LIFE 121

Notes: May also be offered at Cedar Point Biological Station.

Description: Fishes, their taxonomy, physiology, behavior, and ecology. Dynamics of fish stocks and factors regulating their production.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: BIOS 464, BIOS 864, NRES 464, NRES 864; NRES 871; NRES 965

NRES 891 Seminar in Natural Resource Sciences

Description: Presentations of special non-thesis topics, and/or research plans, and/or thesis research results.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

NRES 891A Seminar. Writing in Science

Notes: The goal of this class is to make you a better writer through discussion and critique of published scientific papers.

Description: Writing is the core of how we communicate our scientific findings; fostering good writing skills now will help you throughout your career regardless of if you remain in academia. This class is suitable for all graduate students working on a proposal or a manuscript, or who want to focus on improving their academic reading and writing skills.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

NRES 891B Readings in Aquatic Ecology

Prerequisites: Admission to the Graduate Program in the School of Natural Resources

Description: Read classic (highly cited, generally 25-75 years old) papers and more recent follow-up (<10 years) papers on topics relevant to many areas of aquatic ecology. The goal is to read the basis of the concepts taught in modern Limnology courses and to see how these concepts are currently evolving in the literature. Students will be responsible for choosing a topic and classic paper from a list (see below) and finding (with help) a modern follow up to the issue, and then will lead the group discussion on that topic.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: IND

NRES 892 International Study Tours in Natural Resource Management

Crosslisted with: NRES 492, NRES 492H

Prerequisites: Permission.

Notes: Off-campus travel may be required. Choice of subject matter and coordination of on- and off-campus study is at the discretion of the instructor.

Description: Group educational tours to sites that illustrate the diversity of approaches to natural resources management found around the world.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: FLD

NRES 896 Independent Study

Prerequisites: 12 hrs natural resource sciences or closely-related fields; permission

Description: Individual or group projects in research, literature review or extension of course work under supervision and evaluation of a departmental faculty member.

Credit Hours: 1-5

Min credits per semester: 1

Max credits per semester: 5

Max credits per degree: 5

Format: IND

NRES 897 Master of Applied Science Project

Crosslisted with: AGRI 897, AGRO 897, HORT 897

Prerequisites: Admission to Master of Applied Science degree program

Notes: Project activity for the Master of Applied Science degree.

Description: Design, develop and complete a project that requires synthesis of the course topics covered in the primary area of emphasis.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

NRES 898 Special Topics in Natural Resources

Crosslisted with: NRES 498

Prerequisites: 6 hrs NRES or equivalent.

Description: Current issues in natural resource sciences.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: LEC

NRES 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

NRES 906 Crop Growth and Yield Modeling

Crosslisted with: AGRO 906

Prerequisites: AGRO 325/HORT 325 Introductory Plant Physiology or equivalent

Notes: Recommended: AGRO 406/806 NRES 406/806 HORT 406/806 Plant Ecophysiology or equivalent.

Description: Understanding and use of crop simulation models and ability to build crop models. Studying principles and quantitative descriptions of crop production ecology. Offered fall semester of odd-numbered calendar years.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 907 Agricultural Climatology

Crosslisted with: AGRO 907, HORT 907, METR 907

Prerequisites: NRES 808; STAT 801A or equivalent

Description: Offered spring semester of odd-numbered calendar years. Analysis and use of climatological data as applied to agricultural activities and the use of climatological information to assist in decision making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NRES 916 Environmental Law and Water Resource Management Seminar**Crosslisted with:** CIVE 916**Prerequisites:** Permission**Description:** An interdisciplinary seminar with the Department of Civil Engineering. Contemporary environmental issues and water resource management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 917 Environmental Isotope Hydrology****Crosslisted with:** GEOL 917**Prerequisites:** NRES 819 or equivalent**Description:** Theory and use of stable, radiogenic and radioactive isotopes in hydrologic studies. Abundance and variation of the stable isotopes of oxygen, hydrogen, carbon, sulphur, chlorine, nitrogen, and strontium. Application of the isotopes to determine water origin, movement, geochemical history, recharge age and residence time, and to delineate contaminant sources and solute migration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 918 Applied Groundwater Modeling****Prerequisites:** GEOL/NRES 488/888 or 889, MATH 208/208H, or equivalent**Notes:** Offered fall semester of odd-numbered calendar years.**Description:** Forward and backward numerical analysis of groundwater flow systems and their interactions with other hydro-logic components. Groundwater model development and parameter estimation using MODFLOW, PEST, and other widely used modeling packages.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 920 Xenobiotics in the Environment****Crosslisted with:** AGRO 920, ENTO 920, EOHT 920, HORT 920**Prerequisites:** Recommend one course each in organic chemistry, soil science, biochemistry, plant physiology, microbiology and ecology**Description:** Fate and ecotoxicological impacts of biologically foreign compounds in soil-water-plant environments; uptake, mechanisms of toxicity and metabolism in plants and other biota. Herbicides and other pesticides.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 922 Seminar in Geographic Information Systems (GIS)****Crosslisted with:** GEOG 922**Prerequisites:** GEOG/NRES 812 and 822; or equivalent**Description:** Study of current research and trends in geographic information systems (GIS), GIScience, and GeoComputation. Advanced spatial analytical techniques and geospatial modeling emphasizing GIS applications in natural resources assessment, environmental analyses, agriculture, and land management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 935 Seminar in Historical Geography****Crosslisted with:** GEOG 935**Description:** Discussion of current literature and research on selected aspects of historical geography. Specific theme of course varies according to instructor.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**NRES 954 Turbulent Transfer in the Atmospheric Surface Layer****Crosslisted with:** BSEN 954**Prerequisites:** MATH 821; MECH 310 or NRES 808 or BIOS 857; or equivalent**Notes:** Offered spring semester of odd-numbered calendar years.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 965 Managed Aquatic Systems****Prerequisites:** NRES 463/863 or equivalent; BIOS/NRES 489/889 or equivalent; and permission.**Description:** Theoretical aspects of structure and function in aquatic systems managed for human needs, ecological processes, river-reservoir interface, energy flow (including fate and transport), population dynamics, and multiple-use systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NRES 992 General Seminar****Crosslisted with:** AGRO 992, HORT 992**Notes:** Agronomy and Horticulture PhD students should enroll in this course twice.**Description:** Expected of all Agronomy and Horticulture graduate students. Presentation of thesis/dissertation or non-thesis topics in agronomy, horticulture or related subjects. Agronomy and Horticulture PhD students should enroll in this course twice.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 5**Format:** LEC**NRES 996 Research Other Than Thesis****Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**NRES 996A Research in Soils****Crosslisted with:** AGRO 996A**Prerequisites:** 12 hrs AGRO or closely related sciences, and permission**Credit Hours:** 2-5**Min credits per semester:** 2**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND

NRES 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Nutrition and Health Sciences (NUTR)

NUTR 805 Research Methods

Prerequisites: Graduate standing

Description: Philosophy, goals, and methodologies related to research in nutritional science. Survey and application of basic research tools.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 806 Advanced Teaching Strategies

Crosslisted with: ALEC 805, TEAC 805

Description: Contemporary and innovative teaching strategies, emphasizing learner-centered instruction, suitable to teaching in college and postsecondary institutions, outreach programs public schools, and other settings. Students participate in active learning as they apply learning theory in practice, prepare and demonstrate teaching methods, and plan for instruction in discipline areas of their choice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ALEC 400, ALEC 800; TEAC 905, ALEC 905

NUTR 807 Principles of Epidemiology for Nutrition and Public Health

Crosslisted with: NUTR 407

Prerequisites: NUTR 250 and 3 cr hrs Statistics.

Description: Application of basic concepts of epidemiology to nutrition and public health to include epidemiological research design, estimating outcome measures and determining cause and effect and effectiveness of interventions to prevent and treat disease.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 810 Transdisciplinary Obesity Prevention

Crosslisted with: CYAF 810

Prerequisites: NUTR 455 or equivalent; Graduate standing

Description: Using a transdisciplinary team of faculty and guest lecturers, students will be introduced to the interrelationship of obesity and dietary components, behavior, exercise and sports science, physical activity, health promotion, genetics, nutrigenomics, child development, family dynamics, cultural issues, epidemiology, population disparity, educational leadership, public policy and other related topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NUTR 910, CYAF 910

NUTR 812 Multimedia Applications for Education and Training

Crosslisted with: ALEC 412, ALEC 812

Description: Practical applications in developing and evaluating multimedia resources for students. Surveys new applications, creates and develops various instructional materials, and reviews current practice against relevant theory. Use current software packages to develop materials for various audiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 820 Molecular Nutrition

Prerequisites: BIOC 831

Description: Roles for nutrients in signal transduction, gene expression, intracellular trafficking and cell death.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

NUTR 821 Molecular Nutrition Techniques

Prerequisites: BIOC 831

Notes: NUTR 820 recommended.

Description: Basic techniques for molecular studies in nutritional sciences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 829A Food Security: A Global Perspective

Crosslisted with: ANTH 429A, ANTH 829A, AGRO 429A, AGRO 829A, HORT 429A, HORT 829A, NRES 429A, NRES 829A, NUTR 429A

Prerequisites: Junior standing

Description: Overview of the technical and sociocultural dimensions of global food insecurity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 830 Nutritional Anthropology

Crosslisted with: ANTH 430, ANTH 830, NUTR 430

Prerequisites: ANTH 242 or equivalent.

Description: Anthropological approaches to the study of nutrition. Background to nutrition science; bio-cultural aspects of obesity, fertility, lactose intolerance, and infant feeding practices; biological differences in nutritional requirements, fertility, and mortality; interpretation of nutritional deficiencies in skeletal remains; reconstructing prehistoric diets from archaeological evidence; and evaluation of relationships between dietary patterns and dental remains in fossil record.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Biological Anthropology

NUTR 834 Food and Nutrition in Biocultural Perspective

Description: This seminar-style course takes a multidisciplinary, holistic, comparative approach to examine the complex transformation of biological hunger into what is culturally defined as cuisine. Because food patterns are the result of unique combinations of elements, including ecological, historical, cultural, political, colonial, and illness and disease factors, a broad approach is essential. We consider how edibles are transformed and examine the impact of dietary patterns on health, growth and development, and rates of malnutrition globally.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 841 Functional Properties of Food

Crosslisted with: FDST 441, FDST 841, NUTR 441

Prerequisites: NUTR 245 and BIOC 321; or FDST 448.

Description: Relationship of structure and functionality of ingredients in food systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NUTR 449

NUTR 845 Experimental Foods

Crosslisted with: FDST 445, FDST 845, NUTR 445

Prerequisites: NUTR 244 and 245; BIOC 321.

Description: Introduction to food research. Application of research techniques to selected problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NUTR 449

NUTR 846 Foundations of Health Behavior

Crosslisted with: EDPS 846

Description: The epidemiological, developmental and cognitive foundation of health-related behaviors and identifies opportunities for health promotion and education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 847 Theoretical Models of Health Behavior Change

Crosslisted with: EDPS 847

Description: Application of widely used theoretical models of health behavior change. Specification of behaviors and development and evaluation of theory-based interventions to reduce health-related risks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 855 Teaching Learners to Learn

Crosslisted with: EDAD 855, EDPS 855, SPED 855, TEAC 855

Description: Effective teachers facilitate student learning. Facilitating student learning depends on understanding learning principles and on designing instruction that is compatible with learning principles. Instructors can provide learning-compatible instruction that helps students learn more effectively and ultimately teaches them how to learn. Assists teachers to teach in learning-compatible ways and helps them embed within their curriculum a program for teaching learners to learn.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 856 Clinical Exercise Physiology

Crosslisted with: NUTR 456

Prerequisites: BIOS 214; NUTR/BIOS 484/884; NUTR 486/886.

Description: Cardiovascular, pulmonary, metabolic, pharmacologic, endocrinologic, renal, neurologic, inflammatory, and orthopedic aspects of clinical exercise physiology as they relate to exercise testing and programming.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 857 Classroom and Outreach Experiences in Food and Nutrition

Description: Supervised classroom or outreach experiences in educational or community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

NUTR 858 Exercise, Sports & Performance Nutrition

Prerequisites: BIOS/NUTR 484/884.

Description: Synergistic effects of nutrition and exercise on physical performance, including the potential influences of dietary supplements.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 859 Nutrition: A Focus on Life Stages

Prerequisites: 3 hours undergraduate nutrition and 6 hours undergraduate natural sciences

Description: Nutritional needs throughout the life span including pregnancy, lactation, growth and aging. Approaches to nutrition education for different ages.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 860 Health Behavior Theories and Approaches

Description: Foundation course for developing expertise in public health theory as it applies to physical activity and nutrition and related core practices as an essential means to addressing today's public health issues. Consideration of approaches for complex social problems. Exposure to behavioral theories and models as well as examples of their use in research and application. Understanding and positively influencing health behaviors with a focus on improving nutrition and physical activity, while gaining an appreciation for the gap and limitations that exist between theory and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 862 Health Policy

Description: Critical thinking about policy issues related to health. Identify and define policy issues and problems, formulate different policy options, predict factors that may affect implementation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 870 Cost Control for Foodservice

Crosslisted with: NUTR 470

Prerequisites: NUTR 370

Description: Principles of cost control for foodservice. Integration of cost control and foodservice/restaurant management principles which influence financial integrity. Utilization of the computer as a tool to enhance decision making capabilities.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

NUTR 871 Vines, Wines and You

Crosslisted with: HORT 471, HORT 871, NUTR 471, HRTM 471, HRTM 871

Prerequisites: 6 hrs science or equivalent experience; 21 years of age or older

Notes: Proof of age is required.

Description: Origin, botany, historical and cultural significance of the grapevine and related species. Principles and practices of vineyard establishment, management and processing of grape products, importance and/or scope of grape and wine industry; global and local significance. Culinary applications, health, environmental and safety-related issues, business and industry relations and experience.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 873 Organization and Administration of Foodservice

Crosslisted with: NUTR 473

Prerequisites: NUTR 370.

Description: Organizational, administrative, and human relations concepts to foodservice. Utilization of computer applications in administration of a foodservice facility.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NUTR 973

NUTR 875 Applied Dietetic Practice and Concepts

Prerequisites: Admission to Dietetic Internship

Description: Scientific basis for clinical and community practice and current developments in foodservice systems in professional settings. Documenting professional development.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: FLD

NUTR 880 Introduction to Functional Electrocardiography

Crosslisted with: NUTR 480

Prerequisites: NUTR 486; NUTR/BIOS 484.

Description: Theory and application of electrocardiography in graded exercise testing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 884 Physiology of Exercise

Crosslisted with: NUTR 484

Prerequisites: 12 hrs biological sciences, including BIOS 213 or equivalent; BIOS 214 or equivalent.

Description: Effects of physical activity on the circulatory, respiratory, and other physiological processes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: NUTR 456, NUTR 856; NUTR 480, NUTR 880; NUTR 486, NUTR 886; NUTR 858

NUTR 886 Exercise Testing and Exercise Programming in Adult Fitness and Cardiac Rehabilitation

Crosslisted with: NUTR 486

Prerequisites: NUTR/BIOS 484/884; EDPS 459/859 or STAT 218

Description: In-depth analysis and development of the techniques and knowledge prerequisite for certification in adult fitness and cardiac rehabilitation as prescribed by the American College of Sports Medicine.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: NUTR 480, NUTR 880; NUTR 488

NUTR 891 Special Topics in Human Sciences

Crosslisted with: HUMS 891, SLPA 891, TEAC 891, TMFD 891, CYAF 891

Description: Aspects of human sciences not covered elsewhere in the curriculum.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 894 Essentials of Strength Training & Conditioning**Crosslisted with:** NUTR 494**Prerequisites:** NUTR 384; NUTR 484 or concurrent.**Description:** Overview of the scientific principles and practical applications of strength and conditioning that integrate physiological responses, adaptations, testing, exercise techniques, program design, and periodization for athletic performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 896 Independent Study****Crosslisted with:** NUTR 496**Prerequisites:** 12 hrs in major related areas; permission.**Notes:** Supervised and evaluated by departmental faculty members.**Description:** Individual projects in research, literature review, or creative production.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**NUTR 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**NUTR 905 Research and Evaluation Literature on Health Promotion****Crosslisted with:** EDPS 905**Description:** Philosophical and empirical review and critique of contemporary literature on school, community, work place and health care-based health promotion and education programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 910 Research Planning and Grant Writing for Childhood Obesity****Crosslisted with:** CYAF 910**Prerequisites:** NUTR 810 or CYAF 810**Description:** The purpose of this course is to examine the philosophy, goals, and methodologies related within the concept of childhood obesity research and to apply the principles of the transdisciplinary nature of childhood obesity prevention and treatment in transdisciplinary obesity prevention research and evaluation. The course will include acquisition of resources to address childhood obesity issues, exposure to funding opportunities, research design and grant development, translation of research or programmatic findings to community and professional audiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** NUTR 911, CYAF 911**NUTR 911 Practicum: Experiential Learning Experiences in Childhood Obesity Prevention****Crosslisted with:** CYAF 911**Prerequisites:** NUTR 910 or CYAF 910 or concurrent**Notes:** Practicum: Experiential Learning Experiences in Childhood Obesity Prevention is a section of the Nutrition and Health Sciences Practicum course.**Description:** An applied, monitored, and supervised field based learning experience. Gain practical experience as they follow a negotiated and/or directed plan of study. The purpose of this course is to provide students with transdisciplinary experiential learning experiences related to childhood obesity prevention or treatment. Students will work with the course instructor to determine a practicum site that meets the student's interests and the requirements of the course. Students will work collaboratively with a transdisciplinary team of individuals at the practicum site to meet the course student learning outcomes through hands on experiences.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** FLD**NUTR 920 Teaching Practicum****Crosslisted with:** CYAF 920, TMFD 920**Prerequisites:** CYAF 918**Description:** Supervised classroom experiences designed to develop competencies in teaching at the college level.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**NUTR 921 Interdepartmental Nutrition Seminar****Crosslisted with:** ASCI 921**Prerequisites:** Permission**Description:** Presentation and discussion of current literature and research in the field of nutrition.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**NUTR 922 Lipid Metabolism and Metabolic Syndrome****Description:** Concepts of lipid and lipoprotein metabolism; impact of genetic and nutrient factors on energy metabolism and homeostasis; development and prevention of metabolic disorders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NUTR 925 Energy Metabolism**Crosslisted with:** ASCI 925**Prerequisites:** ASCI 821, BIOC 831, or NUTR 455 or 950**Notes:** Offered odd-numbered calendar years.**Description:** Critically evaluate how research in bioenergetics has contributed to scientific discoveries in the fields of nutrition, biochemistry, and physiology. Methodologies for determination of human and animal energy expenditure and body composition. Specifically, direct calorimetry, indirect calorimetry and comparative slaughter techniques. Emphasis on components of organ and tissue energy expenditures. Background information important in other nutrition courses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 926 Carbohydrate and Lipid Nutrition****Crosslisted with:** ASCI 926**Prerequisites:** BIOC 831, ASCI 821 or NUTR 455 or 950**Notes:** Offered even-numbered calendar years.**Description:** Nutrition and metabolism of carbohydrates and lipids by animals and humans. Emphasis on fundamental principles and current concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 927 Protein and Amino Acid Nutrition****Crosslisted with:** ASCI 927**Prerequisites:** ASCI 421/821 or NUTR 455 or 950; BIOC/BIOS/CHEM 431/831**Notes:** Offered even-numbered calendar years.**Description:** Nutrition and metabolism of proteins and amino acids by animals and humans. Fundamental principles and current concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 930 Sociological/Anthropological Research Methods in Education****Crosslisted with:** CYAF 930, EDPS 930, TEAC 930**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**NUTR 930A Ethnographic Methods****Crosslisted with:** CYAF 930A, EDPS 930A, TEAC 930A, ANTH 930A**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 930B Special Topics in Qualitative and/or Quantitative Research Methods****Crosslisted with:** CYAF 930B, EDPS 930B, TEAC 930B**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**NUTR 930D Discourse Analysis Across School, Home and Community Settings****Crosslisted with:** CYAF 930D, EDPS 930D, TEAC 930D**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 930E Introduction to Linguistic Analysis of Classroom Interaction****Crosslisted with:** CYAF 930E, EDPS 930E, TEAC 930E**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 930J Hermeneutic Traditions in Education****Crosslisted with:** CYAF 930J, EDPS 930J, TEAC 930J**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**NUTR 930K Quantitative Research Traditions in Education****Crosslisted with:** CYAF 930K, EDPS 930K, TEAC 930K**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

NUTR 930M Introduction to Multimodal Textual Analysis

Crosslisted with: CYAF 930M, EDPS 930M, TEAC 930M

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 949 Biochemistry of Nutrition

Crosslisted with: ASCI 949, BIOC 949, BIOS 949

Prerequisites: BIOC 832 or 839

Notes: Offered odd-numbered calendar years.

Description: Offered odd-numbered calendar years. Interrelationships of nutrients, nutritional state and metabolic processes. Energy metabolism, integration of nutrition and metabolism and nutritional regulation of gene function.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

NUTR 950 Integrated Principles of Human Nutrition

Prerequisites: 12 hours of biological sciences which includes biochemistry and physiology

Description: Integration of concepts of nutrient metabolism with food intake recommendations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927

NUTR 952 Advanced Clinical Nutrition

Prerequisites: 6 hrs medical nutrition therapy or clinical nutrition

Description: Interrelationships between diet intervention and disease. Current theories.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 954 Fundamentals of Nutrition Counseling

Prerequisites: 12 hours NUTR and 6 hrs social science

Description: Theories of behavior change and application to nutrition counseling. Practice in development of nutrition counseling skills. Current nutrition problems and applications to diverse clients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 956 Community Nutrition

Prerequisites: NUTR 356

Description: Historical perspectives, research methodology, and assessment techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 960 Nutrient Function During Exercise

Description: Exercise and its influence on human metabolism and nutrition via biochemical and physiological pathways. Current research topics and trends addressing the interrelationships between exercise and energy, macronutrients, and micronutrients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

NUTR 973 Organizational Administration in Food Service and Restaurant Management

Prerequisites: NUTR 873

Description: Investigation of foodservice/restaurant organizations and administration. Critical evaluation of current literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

NUTR 986 Graduate Seminar

Prerequisites: Permission

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

NUTR 991 Field Studies in Education

Crosslisted with: EDAD 991, TEAC 991

Prerequisites: Permission

Description: Identification and solutions of problems associated with program planning; organizational, administrative, and instructional procedures within an institutional setting. Designing, implementing, and evaluating new or modified patterns of operation and teaching within a public school, postsecondary institution, or adult education agency.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

NUTR 992 Advanced Human Nutrition Topics

Prerequisites: Permission

Description: In-depth evaluation of current human nutrition issues.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

NUTR 994 Advanced Food Topics

Prerequisites: Permission

Description: In-depth evaluation of food studies, culinology, and research issues.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

NUTR 995 Doctoral Colloquium**Prerequisites:** Permission**Description:** Intended primarily for doctoral students, although non-doctoral students are admitted with permission. Work with a faculty mentor, either on an individualized or on a small group basis. Outcome-based scholarly activities. The interaction between research and practice.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 18**Format:** IND**NUTR 996 Research Other Than Thesis****Prerequisites:** Permission**Credit Hours:** 1-8**Min credits per semester:** 1**Max credits per semester:** 8**Max credits per degree:** 8**Format:** IND**NUTR 998 Special Topics in Human Sciences****Crosslisted with:** CYAF 998, TMFD 998**Prerequisites:** Permission**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** IND**NUTR 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Philosophy (PHIL)

PHIL 801 Philosophical Analysis**Prerequisites:** Permission from philosophy graduate adviser**Description:** Seminar for beginning graduate students whose primary goal is the development of basic philosophical skills such as the analysis of primary texts, the writing of philosophical papers, and sustained oral discussion. Readings include a significant number of important works drawn from diverse areas of philosophical inquiry. Class meetings devoted primarily to student presentations of reading materials and their own written work. Effective oral discussion on the part of the student required.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHIL 805 Philosophy of Language****Crosslisted with:** PHIL 405**Prerequisites:** 9 hours PHIL.**Description:** Introduction to some of the basic concepts and problems in the philosophy of language. Topics to be discussed include reference, definite descriptions, names, demonstratives, truth, meaning, speech acts, and the logic of expressions involving so-called "propositional attitudes." Authors studied include Frege, Russell, Tarski, Austin, Grice, Strawson, Quine, Kripke, Kaplan and Davidson.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHIL 809 Theory of Knowledge****Crosslisted with:** PHIL 409**Prerequisites:** 9 hours PHIL.**Description:** Intensive study of basic problems in the Theory of Knowledge: the nature of knowledge, the analysis of perception and memory, the justification of induction, the problem of how one knows other minds, and the analysis of a prior knowledge. Readings from recent work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHIL 811 Formal Logic****Crosslisted with:** PHIL 411**Prerequisites:** PHIL 211 or MATH 310 or MATH 325 or CSCE 235.**Description:** An advanced course in symbolic logic, covering metatheoretical results about selected systems of logic. Topics may include: the soundness and completeness of classical propositional logic, and of some propositional modal logics; non-classical propositional logics; and extensions of and alternatives to classical first-order predicate logic**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHIL 812 Modal Logic****Crosslisted with:** PHIL 412**Prerequisites:** PHIL 211; 6 additional hours in PHIL.**Description:** Syntax and model theory of quantified modal logic with applications to e.g., deontic logic, epistemic logic, and the philosophy of logic.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHIL 814 Philosophy of Mind****Crosslisted with:** PHIL 414**Prerequisites:** 9 hours PHIL.**Description:** Main problems in the philosophy of mind, including dualism and materialism, instrumentalism and eliminativism, wide and narrow content, qualia, and mental causation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PHIL 817 Philosophy of Science

Description: Intensive study of some main problems in the philosophy of science: explanation and prediction in the sciences, the nature of scientific laws, functional explanations in the biological and social sciences, the structure of scientific theories, the ontological status of theoretical entities, the reduction of scientific theories, the confirmation of scientific hypotheses, and value judgments in the acceptance of scientific hypotheses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 818 Metaphysics

Crosslisted with: PHIL 418

Prerequisites: 9 hours PHIL.

Description: Intensive study of main problems in metaphysics, especially universals and particulars, the relation of mind and matter, the categories of the real, criteria of identity, and existential propositions. Readings from recent philosophers.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 820 Philosophy of Social Science

Crosslisted with: PHIL 420

Prerequisites: 9 hours PHIL.

Description: The epistemological character of the social sciences. Character and explanatory role of social scientific generalizations, various explanatory strategies for social matters, the continuity or discontinuity of the social sciences with the special sciences, the importance of interpretation, and the place of rationality.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 823 Advanced Ethics

Crosslisted with: PHIL 423

Prerequisites: 9 hours PHIL.

Description: Critical study of leading theories in ethics, with close attention to major works, chiefly modern and contemporary. Includes naturalism, intuitionism, emotivism, utilitarianism, Neo-Kantian ethics, and various current positions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 825 Political and Social Philosophy

Crosslisted with: PHIL 425

Prerequisites: 9 hours PHIL.

Description: Critical study of main problems and leading theories in social and political philosophy. Origin and justification of political obligation, with emphasis on social contract theories; the nature and foundation of individual rights and the strength of these rights when they conflict with each other and with concern for the common good; the principles of social justice and the obligation to protect the welfare of others; and the concepts of personal autonomy, liberty, equality, and freedom. Readings from a combination of historical and recent work, and emphasis on relating the various issues to current problems in society.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 850 Ancient Philosophy

Crosslisted with: PHIL 450

Prerequisites: 9 hours PHIL.

Description: Advanced survey of ancient philosophy from the pre-Socratics through Aristotle, concentrating on central epistemological and metaphysical issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 860 History of Modern Philosophy

Crosslisted with: PHIL 460

Prerequisites: 9 hours PHIL.

Description: Advanced survey of early European philosophy from the late renaissance through the Enlightenment, concentrating on central epistemological and metaphysical issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 871 Kant

Crosslisted with: PHIL 471

Prerequisites: 9 hours PHIL.

Description: Kant's philosophy, and of problems in the interpretation of his writings. The primary text will be the First Critique.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 896 Philosophical Themes

Crosslisted with: PHIL 496

Prerequisites: Permission.

Description: Library work and conferences.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

PHIL 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

PHIL 903 Philosophy of Mathematics

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 905 Philosophy of Language

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 911 Topics in Logic

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 913 Advanced Epistemology

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

PHIL 914 Philosophy of Mind

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PHIL 915 Advanced Metaphysics

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

PHIL 917 Philosophy of Science

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 920 Ethical Theory

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 921 Aesthetics

Prerequisites: Graduate standing in the humanities

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

PHIL 923 Philosophy of Psychology

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 925 Social and Political Philosophy

Description: Intensive discussion of one or more of the main problems of social and political philosophy. Variable content. Possible topics are: political obligation, the concept of political authority, natural rights, the public interest, the aims of the state, and distributive justice.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

PHIL 952 Greek Philosophy

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 955 Empiricism

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 957 Quine

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 960 Rationalism

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 971 Kant

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

PHIL 991 Special Studies in Philosophy I**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**PHIL 992 Special Studies in Philosophy II****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**PHIL 998 Dissertation Seminar****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**PHIL 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Physics (PHYS)

PHYS 801 Computational Physics**Crosslisted with:** PHYS 401**Prerequisites:** PHYS 311 or parallel.**Description:** Re-formulation of physics problems for solution on a computer, control of errors in numerical work, and programming.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 811 Methods of Theoretical Physics I****Description:** Fundamentals of applications of linear algebra, tensor analysis, complex analysis, ordinary differential equations and special functions to problems in theoretical physics with emphasis on special relativity, electrodynamics and nonrelativistic quantum mechanics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 812 Methods of Theoretical Physics II****Description:** Green's functions and integral transforms to solve boundary value problems in various physical systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 813 Methods of Theoretical Physics III****Description:** Application of discrete and continuous groups to various problems in solid state physics, atomic physics, high-energy physics and classical mechanics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 822 Introduction to Physics and Chemistry of Solids****Crosslisted with:** PHYS 422, ECEN 422, ECEN 822**Prerequisites:** PHYS 213 or CHEM 481/881, MATH 221/821.**Description:** Introduction to structural, thermal, electrical, and magnetic properties of solids, based on concepts of atomic structure, chemical bonding in molecules, and electron states in solids. Principles underlying molecular design of materials and solid-state devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 831 Thermal Physics****Crosslisted with:** PHYS 431**Prerequisites:** PHYS 213.**Description:** Thermal phenomena from the point of view of thermodynamics, kinetic theory, and statistical mechanics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 841 Experimental Physics I****Crosslisted with:** PHYS 441**Prerequisites:** PHYS 213, 223 and 231**Notes:** Lab fee required.**Description:** Methods and techniques of modern experimental physics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 842 Experimental Physics II****Crosslisted with:** PHYS 442**Prerequisites:** PHYS 441/841 or permission.**Description:** Continuation of PHYS 441/841.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 843 Experimental Physics III****Crosslisted with:** PHYS 443**Prerequisites:** PHYS 442/842 or permission.**Description:** Continuation of PHYS 442/842.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PHYS 851 Electromagnetic Theory**Crosslisted with:** PHYS 451**Prerequisites:** PHYS 213; MATH 221/821.**Description:** Theory of electric and magnetic fields and their interaction with charges and currents, Maxwell's equations, electric and magnetic properties of matter.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 852 Optics and Electromagnetic Waves****Crosslisted with:** PHYS 452**Prerequisites:** PHYS 451/851.**Description:** Production of electromagnetic waves, wave guides and cavities, properties of waves, plane waves, reflection and refraction, interference and coherence phenomena, polarization. Optical properties of matter.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 861 Quantum Mechanics****Crosslisted with:** PHYS 461**Prerequisites:** PHYS 213 and 311; or permission.**Description:** Basic concepts and formalism of quantum mechanics with applications to simple systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 862 Atoms, Nuclei, and Elementary Particles****Crosslisted with:** PHYS 462**Prerequisites:** PHYS 461 or permission.**Description:** Basic concepts and experimental foundation for an understanding of the physics of atoms, nuclei, and elementary particles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 880 Introduction to Lasers and Laser Applications****Crosslisted with:** ECEN 480, ECEN 880, PHYS 480**Prerequisites:** PHYS 213/(UNO) PHYS 2130.**Description:** Physics of electronic transition production stimulated emission of radiation. Threshold conditions for laser oscillation. Types of lasers and their applications in engineering.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 891 Special Topics in Physics****Crosslisted with:** PHYS 491**Prerequisites:** PHYS 213 and permission.**Description:** Topics vary.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**PHYS 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**PHYS 911 Classical Mechanics****Description:** Lagrangian and Hamiltonian formulations of the laws of motion; variational principles; dynamics of rigid bodies; other advanced topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 912 Statistical Physics****Prerequisites:** or parallel: PHYS 911 and 916, or permission**Description:** The laws of thermodynamics and thermodynamic functions; ensembles; Boltzmann, Fermi-Dirac, and Bose-Einstein statistics; kinetic theory and transport phenomena. Application to macroscopic systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 913 Electromagnetic Theory I****Description:** Electrostatics, magnetostatics, and Maxwell's equations; solutions to boundary value problems and Green's functions; electromagnetic radiation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 914 Electromagnetic Theory II****Prerequisites:** PHYS 913 or permission**Description:** Special relativity and covariant formulation of electrodynamics; kinematics and dynamics of charged particles; radiation from moving charges; multipole radiation fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 916 Quantum Mechanics I****Prerequisites:** Permission**Description:** Introduction to the formalism of quantum mechanics; applications to elementary systems; angular momentum; scattering theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PHYS 917 Quantum Mechanics II**Prerequisites:** PHYS 916 or permission**Description:** Hilbert-space formulation of quantum mechanics; stationary and time-dependent perturbation theory; variational methods; spin; many-particle systems and identical particles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 918 Quantum Mechanics III****Prerequisites:** PHYS 913 and 917, or permission**Description:** Introduction to relativistic electron theory; formal scattering theory; semi-classical radiation theory; second quantization and application to many-particle systems, elements of quantum electrodynamics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 925 Introduction to Atomic and Molecular Physics****Prerequisites:** PHYS 916 or permission**Description:** Selected topics in atomic and molecular physics with emphasis on experimentally observed phenomena, including atomic and molecular spectra and scattering phenomena, and molecular structure.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 926 Introduction to Nuclear and Elementary-Particle Physics****Prerequisites:** PHYS 917 or permission**Description:** Selected topics in nuclear and elementary particle physics with emphasis on experimentally observed phenomena, including nuclear forces, energy levels, nuclear models, decay of unstable nuclei, fundamental interactions and classification schemes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 927 Introduction to Solid-State Physics****Prerequisites:** PHYS 912 and 916, or permission**Description:** Selected topics in solid-state physics with emphasis on experimentally observed phenomena, including the structure and thermal, electric, magnetic, and elastic properties of metals, semiconductors, and insulators.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 928 Introduction to Plasma Physics****Prerequisites:** PHYS 911, 913, and 914**Description:** Fundamentals of plasma physics. Motion of charged particles, basic plasma models, waves in plasma, laser-plasma interactions. Applications such as magnetic and inertial confinement fusion, astrophysics, plasma-based accelerators, advanced light sources, and semiconductor materials processing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PHYS 951 Advanced Topics in Solid-State Physics****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**PHYS 955 Advanced Topics in Atomic Physics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**PHYS 996 Research Other Than Thesis****Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 18**Format:** IND**PHYS 998 Special Topics in Physics****Prerequisites:** Permission**Description:** Offered as the need arises to treat special topics not covered in other 900-level courses.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**PHYS 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Plant Health Program (DPLH)

DPLH 691 Plant Health Colloquium**Description:** Exploration of professionalism and professional opportunities in plant health and importance of leadership development.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 2**Format:** LEC**DPLH 695 Plant Health Internship****Description:** Professional experience in integrating interdisciplinary knowledge, practical problem-solving, and developing and implementing integrated plant and pest management systems.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 16**Format:** FLD

Plant Pathology (PLPT)

PLPT 801 Biology of Plant Pathogens

Crosslisted with: AGRO 801, HORT 801

Prerequisites: PLPT 369 or equivalent.

Description: Molecular and cellular approach to the study of plant pathological principles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

PLPT 802 Ecology and Management of Plant Pathogens

Crosslisted with: AGRO 802, HORT 802

Prerequisites: PLPT 369 or equivalent; an introduction to biochemistry course

Description: Principles of plant disease epidemiology and disease control through cultural, biological, chemical and host plant resistance strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: PLPT 965, AGRO 965, HORT 965

PLPT 813 Biological Control of Pests

Crosslisted with: ENTO 813

Prerequisites: 12 hrs biological sciences and/or agricultural sciences

Description: Principles and practices of using natural enemies and antagonists to manage the abundance of pests and reduce economic losses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PLPT 814 Turfgrass Disease Management

Crosslisted with: AGRO 414, AGRO 814, HORT 414, HORT 814, PLPT 414, TLMT 414, TLMT 814

Prerequisites: BIOS/PLPT 369 or one semester of introductory plant pathology.

Description: Pathogens, epidemiology, and control of diseases specific to turfgrass.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

PLPT 817 Plant Pathology Principles and Application

Crosslisted with: AGRO 817, HORT 817

Prerequisites: 12 hours of prior coursework in the plant sciences

Description: Introduction to the biology of plant pathogenic organisms; pathogen-plant interactions; environmental influences; cultural, resistance, and chemical strategies for plant disease management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PLPT 866 Phytopathogenic Nematodes

Prerequisites: PLPT *801 or *802; and permission

Description: Principles of nematode-induced disease of plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PLPT 867 Plant Associated Microbes

Prerequisites: A course in general microbiology, bacteriology, or mycology. A course in general plant pathology is highly recommended.

Description: Biology, ecology, and taxonomy of bacteria and fungi pathogenic or beneficial to plants. Microorganism isolation from plants and soil. Identification and plant inoculation.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

PLPT 891 Plant Disease Field Tour

Description: Diseases in Nebraska agricultural, urban, and wildland plant ecosystems; field diagnosis and management. One-week tours will be held in the summer prior to semester of enrollment.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

PLPT 892 Special Topics in Plant Pathology

Prerequisites: 12 hrs of microbiology, plant science or related fields

Notes: Topics vary.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 12

Format: LEC

PLPT 963 Genetics of Host-Parasite Interaction

Crosslisted with: AGRO 963, HORT 963

Prerequisites: BIOS 820; and permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PLPT 965 Plant Virology

Crosslisted with: AGRO 965, HORT 965

Prerequisites: PLPT 801 or 802; and permission.

Notes: PLPT 865 is offered odd-numbered calendar years.

Description: Virus molecular biology; virosphere; virus-vector relationships; plant resistance to virus infection economic impact and control of plant diseases by viruses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

PLPT 968 Seminar in Plant Pathology**Crosslisted with:** AGRO 968, HORT 968**Prerequisites:** Permission.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**Offered:** SPRING

Political Science (POLS)

POLS 800 Research Methods**Crosslisted with:** SRAM 800**Description:** Basic techniques used in quantitative political science research. The general linear model. Basic probability theory, ordinary least squares regression, and how to solve problems often encountered when conducting quantitative analyses in political science.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 801 Scope and Methods of Political Science****Description:** The character of political science as a form of inquiry-what it seeks to know it and how it seeks to know it. The discipline of political science as a science; the meaning of concepts, generalizations, laws, theories and explanations; and concept formation and theory building as embodied in major studies of politics. Alternative understandings of the character and possibility of a science of politics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 802 Professional Development in Political Science****Prerequisites:** Permission**Description:** Professional development topics, teaching methods, grant writing and article writing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 820 Core Seminar in American Government****Description:** Literature in American governmental institutions, processes, policies, and law. Students required to do extensive reading in these areas. Introduces the beginning graduate student to the field of American government.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 825 Congress and Public Policy****Crosslisted with:** POLS 425**Description:** The policy making role of the Congress including the institutionalization of the House and the Senate, an analysis of congressional behavior, the committee process, and the policy responsiveness of Congress.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**POLS 826 Topics in American Public Policy****Crosslisted with:** POLS 426**Description:** A significant public policy in American politics. Topics: science, technology, and public policy; or health politics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** American Government&Public Pol**POLS 830 Political Communication****Crosslisted with:** COMM 430, POLS 430, COMM 830**Prerequisites:** 12 hrs communication studies.**Description:** Role of communication in the political process, with emphasis on communication strategies in political campaigns. Includes communication variables important in the political process, an application of communication theory and principles to political rhetoric, and analysis and criticism of selected political communication events.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**POLS 831 Core Seminar in Public Policy and Process****Description:** Intended for graduate students interested in a review of the field.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 836 Public Policy Analysis: Methods and Models****Description:** Qualitative and quantitative approaches to public policy analysis. Nature of politics and policy, formation of public policy, analysis of policy content, methodological triangulation, participatory policy making designs, and the role of the analyst. Construct and implement a multi-method policy analysis for a local community agency.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 841 Constitutional Law****Crosslisted with:** POLS 441**Description:** Supreme Court doctrine determining the distribution of powers within the national government and between the national government and the state governments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**POLS 842 Civil Liberties: Freedom of Expression and Conviction****Crosslisted with:** POLS 442**Description:** Supreme Court doctrine interpreting the First Amendment, covering freedom of speech, assembly, and association; freedom of the press; and freedom of religion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol

POLS 843 Civil Liberties: Issues of Fairness and Equality**Crosslisted with:** POLS 443**Description:** Supreme Court doctrine covering the rights of the accused, the right to privacy and the right to racial and sexual equality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**POLS 850 Core Seminar in Biology and Politics****Description:** Introduction to the relationship between the fields of biology and politics. The political implication of genetics, physiology, neuro-imaging, and evolutionary psychology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 859 International Political Economy****Crosslisted with:** POLS 459**Description:** Interface of politics and economics in the international arena. Political dimension of international economic issues emphasized. Includes: liberal, mercantile, and radical approaches; theories of imperialism; dependency and interdependency; distribution of the global product; the global division of labor; the political aspects of markets; the politics of trade, aid, investment, multinational corporations, food, and energy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** International Relations&Compar**POLS 860 Core Seminar in International Politics****Description:** Extensive reading required. Rigorous survey of the literature in international relations, including international law and international organization. Intended to introduce the beginning graduate student to the field of international relations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 863 American Foreign Policy and the Use of the Military****Crosslisted with:** POLS 463**Description:** Military action as an instrument of American foreign policy. Constitutional basis of the president's and Congress's war powers; assessments of the role of the White House, Congress, CIA, senior pentagon officials, the American public, and military alliances - NATO and coalitions of the willing - in supporting and directing the use of military action abroad; and the political and strategic consequences of various American applications of military force.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human Rights and Security**POLS 866 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, AECN 467, ANTH 479, ANTH 879, ECON 866, GEOG 448, GEOG 848, HIST 479, HIST 879, SOCI 466, SOCI 866**Prerequisites:** Senior standing and permission.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations&Compar Variable group based on topic**POLS 867 Pro-seminar in International Relations II****Crosslisted with:** ECON 467, ECON 867, POLS 467**Prerequisites:** Senior standing and permission.**Notes:** Open to students with an interest in international relations. Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** International Relations&Compar**POLS 869 International Law****Crosslisted with:** POLS 469**Description:** Rules and principles accepted by the members of the community of nations as defining their rights and duties, and the procedure employed in protecting their rights and performing their duties.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**Groups:** International Relations&Compar**POLS 870 International Human Rights****Crosslisted with:** POLS 470**Description:** Development of international norms on human rights and attempts to implement those standards. Emphasis on political process, with attention to law, philosophy, economics, and culture. Coverage of the United Nations, regional organizations, private agencies, and national foreign policies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human Rights and Security**POLS 873 Problems in International Law and Organization****Crosslisted with:** POLS 473**Notes:** POLS 361 or 469 highly recommended.**Description:** Selected issues in international law and organization. Content varies. Includes: US Senate's treatment of treaties, use of customary law by US courts, current cases before the World Court, leading legal issues handled by the UN Security Council and General Assembly, etc.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Human Rights and Security

POLS 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475

Prerequisites: Senior standing.

Notes: Capstone course.

Description: Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: American Government&Public Pol

POLS 876 Ethnic Conflict and Identity

Crosslisted with: JUDS 476, POLS 476

Description: Theories of nationalism and ethnic conflict. Case studies of Europe, the Middle East, and Africa. The post-Cold War era as multi-polar and multi-civilizational. The states and different cultures that compete for influence and authority to dominate the "New World order." The division of the world along ethnic, religious, and class lines rather than by ideology. The future of international politics and the reassessment of the causes of "conflicts of culture" and their containment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: International Relations&Compar

POLS 877 Israel and the Middle East

Crosslisted with: JUDS 477, POLS 477

Description: Israeli politics, society, and relations with its neighbors, particularly the Palestinians. Rise of Zionism and the Palestinian response to it; wars between Israel and Arab neighbors, and the eventual peace agreements between the two; the internal dynamics of Israeli political life; and state of Zionism today.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: International Relations&Compar

POLS 878 Pro-seminar in Latin American Studies

Crosslisted with: ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, GEOG 878, HIST 878, SOCI 878, MODL 878, EDPS 878

Prerequisites: Junior standing and permission.

Notes: Topical seminar required for all Latin American Studies majors.

Description: An interdisciplinary analysis of topical issues in Latin American Studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

Groups: Integrative Courses, Research Regional Geography Lat Am,Asian,Middle East Hist International Relations&Compar

POLS 879 Core Seminar in Comparative Politics

Description: POLS 879 is intended to introduce the beginning graduate student to the field of comparative politics. Survey of the field of comparative politics. General theory and methodology; issues and crises in a number of functional areas; participation and socialization; and the special problems confronting the area specialist.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

POLS 880 Core Seminar in Political Theory

Description: Students required to read extensively and to take a final examination. Rigorous survey of some of the major areas of concern in empirical and normative political theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

POLS 891 Individual Readings

Prerequisites: Permission

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

POLS 895 Internship

Description: Internship in government agencies, quasi public agencies, private firms (profit and nonprofit), and other organizations.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

POLS 898 Special Topics

Crosslisted with: POLS 498

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

POLS 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

POLS 901 Dissertation Prospectus

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

POLS 920 Seminar in American Government

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

POLS 931 Seminar in Public Policy**Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**POLS 941 Seminar in Methods****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**POLS 950 Research Seminar in Biology and Politics****Description:** Advanced research in the relationship between biology and politics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 960 Seminar in International Relations****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**POLS 965 Seminar in International Human Rights****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 979 Research Seminar in Comparative Politics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 987 Readings and Problems in 20th-Century International History****Crosslisted with:** HIST 987**Description:** Provides a foundational understanding of major developments in the 20th century, including colonialism and decolonization, great-power conflicts, world economy, and role of ideology. Incorporates perspectives of international relations, world history, and transnational history. Letter grade only.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**POLS 991 Minor Research Problems****Prerequisites:** Permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**POLS 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Psychology (PSYC)

PSYC 821 Psychology of Gender**Crosslisted with:** PSYC 421, WMNS 421, WMNS 821**Prerequisites:** 12 hrs PSYC.**Description:** Theory and research on the role of gender in human behavior and attitudes. Diverse theoretical positions on the development of gender and the biological, social, and cultural bases that influence the relationship between gender and a variety of areas of human experience (e.g., intelligence and achievement, emotion, relationships, sexuality, physical fitness, stress, and coping).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 825 Psychology of Racism****Crosslisted with:** ETHN 425, PSYC 425**Prerequisites:** PSYC 350.**Description:** Major terms and issues in psychology that pertain to race and racism in the United States. General principles of the psychology of racism that are universal. Psychology of the major racial minority groups in the United States examined through their unique cultures, histories, traditions, and collective identities. Research methods for the psychology of racism reviewed as a basis for interpreting research results.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 828 Health Psychology****Crosslisted with:** PSYC 428**Prerequisites:** Junior standing.**Description:** The relationship between psychological factors and physical health. Health behavior, health decision-making, health promotion and coping from a variety of theoretical perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 840 Perspectives in Psychology****Crosslisted with:** PSYC 440**Prerequisites:** 12 hrs psychology including PSYC 350 or concurrent enrollment in PSYC 350**Description:** Currently important fundamental issues in psychology, focusing on controversies within the science of psychology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PSYC 850 Advanced Research Design and Data Analysis**Crosslisted with:** PSYC 450**Prerequisites:** PSYC 350 with a grade of B or better.**Notes:** PSYC 450/850 (usually offered in the fall) and PSYC 451/851 (usually offered in the spring) can be taken in any order.**Description:** Presentation of advanced, experimental, quasi-experimental, and non-experimental research designs and statistical models employed in psychological and behavioral research. Factorial ANOVA and ANCOVA designs and analysis, with interpretation and presentation of the results in oral, written, and web-based formats. Create, perform, and present an individual research project.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**PSYC 851 Multivariate Research Design and Data Analysis****Crosslisted with:** PSYC 451**Prerequisites:** PSYC 350 with a grade of B or better**Notes:** PSYC 450/850 (usually offered in the fall) and PSYC 451/851 (usually offered in the spring) can be taken in any order.**Description:** Presentation of multivariate research designs and statistical models employed in psychological and behavioral research. Analysis using multiple regression and linear discriminant function models; interpretation and presentation of the results in oral, written, and web-based formats. Create, perform, and present an individual research project.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**PSYC 858 Behavior Genetics****Crosslisted with:** PSYC 458**Prerequisites:** PSYC 273 OR PSYC 373 OR BIOS 373.**Description:** Introduction to concepts and research in behavior genetics. The role of heredity in normal and disordered behaviors will be examined, with a special emphasis on the mechanisms by which genetic variation influences individual differences in behavior.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 860 Human Memory****Crosslisted with:** PSYC 460**Prerequisites:** PSYC 263.**Description:** Issues in human memory within the context of cognitive psychology: attention; short and long term memory; retrieval processes; semantic memory; how long-term memory is involved in comprehension and knowledge; how emotion affects memory; and the major research paradigms used in the study of memory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 861 Learning Processes****Crosslisted with:** PSYC 461**Prerequisites:** PSYC 368.**Description:** Evaluation and discussion of studies in learning and cognition that draws from the research literature with nonhuman animals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 862 Motivation and Emotion****Crosslisted with:** PSYC 462**Prerequisites:** Junior standing.**Description:** Major problems and methods involved in the study of motivation and emotion including theoretical considerations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 863 Perception****Crosslisted with:** PSYC 463**Prerequisites:** PSYC 263 OR PSYC 273 or PSYC 373 or BIOS 373.**Description:** Analysis and comparison of approaches to the study of current problems in human perception and information processing.

Psychophysical judgment, signal detection theory, perception of form and space, and the role of imagery in perception.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 865 Behavioral Neuroscience****Crosslisted with:** BIOS 465, BIOS 865, PSYC 465**Prerequisites:** PSYC 273 or PSYC 373 or BIOS 373.**Description:** Relationship of physiological variables to behavior, an introduction to laboratory techniques in neuropsychology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 866 Attention and Performance****Crosslisted with:** PSYC 466**Prerequisites:** PSYC 263.**Description:** Theory and research on human attention and the critical link between attention and performance within the context of cognitive psychology. The influence of various factors on attention (e.g. emotion, video games, cognitive disorders) and how these influence behavior (e.g. eye movements, perception, motor control, search).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PSYC 871 Human Sexuality and Society

Crosslisted with: CYAF 471, EDPS 471, PSYC 471, SOCI 471, CYAF 871, EDPS 871, SOCI 871

Prerequisites: Junior standing.

Notes: Open to advanced students planning careers in the professions in which knowledge of human behavior and society is important (e.g., helping professions, medicine, law, ministry, education, etc.).

Description: Interdisciplinary approach to the study of human sexuality in terms of the psychological, social, cultural, anthropological, legal, historical, and physical characteristics of individual sexuality and sex in society.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 883 Advanced Social Psychology

Crosslisted with: PSYC 483

Prerequisites: PSYC 288.

Description: Current problems, methods, and findings in the study of individual behavior as it is influenced by the social environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 886 Clinical Psychology

Crosslisted with: PSYC 486

Prerequisites: PSYC 380.

Description: Fundamental procedures in clinical practice, a critical evaluation of diagnostic and therapeutic techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 889 Child Behavior and Development

Crosslisted with: PSYC 489

Prerequisites: PSYC 289 or CYAF 160; PSYC 350 or permission.

Description: Current issues in theory and research in developmental psychology examined (e.g., emotional development, the changing American family, the preschool years, social understanding), along with methods of research in these and other areas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

PSYC 901 Pro-seminars in Cognition and Learning

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 902A Developmental: Biological and Cognitive Development

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 902B Developmental: Social and Personality Development

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 903 Proseminar in Personality

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 904 Proseminar in Physiological

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 905 Proseminar in Sensation and Perception

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 906 Proseminar in Social Psychology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 907 Proseminar in Cognitive Psychology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 908 Proseminar in Clinical-Community

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 909 Proseminar in Psychopathology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 910 Proseminar in History and Philosophy of Psychology**Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 920 Seminar in Psychology: Abnormal****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 921 Seminar in Psychology: Developmental****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 922 Seminar in Psychology: Clinical****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 924 Seminar in Psychology: Learning****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 925 Ethics for Psychologists****Prerequisites:** Permission**Description:** Introduction to ethical principles and reasoning for research, teaching and professional practice in psychology.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**PSYC 925A Ethics for Clinical Psychologists****Prerequisites:** Advanced graduate standing and permission**Description:** Application of ethical principles to practica and professional practice. Critique of the status of a professional mental health discipline, a discipline's ethical code, and practice in society.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**PSYC 925B Ethics for Psychology and the Law****Prerequisites:** PSYC 925**Description:** Application of ethical principles to the practice of psychology in interaction with legal institutions with an emphasis on the communication of psychological expertise and research to those legal institutions.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**PSYC 926 Seminar in Psychology: Personality****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 928 Seminar in Psychology: Motivation & Emotion****Prerequisites:** Advanced graduate standing and permission.**Description:** Seminar that examines some basic tenets of the psychology of emotion and motivation from a social psychological perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**PSYC 929 Seminar in Psychology: Social Behavior****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 930 Seminar in Psychology: Psychometric Methods****Prerequisites:** Advanced graduate standing and permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**PSYC 941 Fundamentals of Research Design and Data Analysis 1****Prerequisites:** Instructor permission**Notes:** PSYC 941 is usually offered every fall.**Description:** Presentation of basic methods, designs, and data analysis techniques employed in psychological and behavioral research. Univariate and bivariate statistical analyses and research hypothesis testing, multiple groups ANOVA, multiple regression, and the general linear model (GLM).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** PSYC 942; PSYC 944; PSYC 948

PSYC 942 Fundamentals of Research Design and Data Analysis 2**Prerequisites:** PSYC 941 and instructor permission**Notes:** PSYC 942 is usually offered every spring.**Description:** Presentation of additional basic methods, designs, and data analysis techniques employed in psychological and behavioral research. Factorial designs and ANOVA, integrating these designs into the general linear model (GLM), testing and comparing models, uses of statistical control, path analysis, linear discriminant function analysis, and cluster analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** PSYC 943; PSYC 944; PSYC 948**PSYC 943 Fundamentals of Multivariate Modeling****Prerequisites:** PSYC 942 and instructor permission**Notes:** Pre-requisite for PSYC 944 and PSYC 948.**Description:** Presentation of the core topics in modern multivariate analysis, including extensions of linear models involving link functions, maximum likelihood and Bayesian estimation, missing data, path models for multivariate regression and mediation, repeated measures analysis of variance, and exploratory factor analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 944 Multilevel Modeling in the Behavioral Sciences****Prerequisites:** PSYC 941 & 942 or instructor permission**Description:** Applications of the multilevel model (i.e., hierarchical linear model, general linear mixed model) for analyzing nested data with a particular focus on longitudinal data analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**Prerequisite for:** PSYC 945**PSYC 945 Advanced Multilevel Models****Prerequisites:** PSYC 944 and permission**Description:** Advanced applications of the multilevel model (hierarchical linear model, general linear mixed model) for examining multiple sources of variation, models for crossed sources of nesting, three levels of nesting, heterogeneous variances, multivariate outcomes, and non-linear outcomes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 946 Psychology of Survey Response****Crosslisted with:** SRAM 946**Description:** Cognitive and communicative processes affect on dynamics of survey interviewing and relationships to principles of survey design. Effects of question wording on comprehension; question order and context on attitude; communicative and retrieval processes on validity of retrospective behavioral reports; and impact of response alternatives on answers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 947 Questionnaire Design****Crosslisted with:** SOCI 947, SRAM 947**Description:** Design of questionnaires for survey research and the theoretical and practical issues arising from them. Selection of appropriate measurement techniques for assessing opinions, past behaviors and events, and factual material.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 948 Structural Equation Modeling in the Behavioral Sciences****Prerequisites:** PSYC 941 & 942 or instructor permission**Notes:** PSYC 944 and PSYC 948 may be taken in any order.**Description:** Fundamentals and foundations of SEM (model specification and identification, data preparation, model estimation, model respecification, reporting results) and specific applications of path analysis (moderation, mediation, and moderated mediation) and latent variable modeling (standard and nonstandard CFA models, integrating latent variables into path models, multiple group analysis).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**PSYC 955 Introduction to Clinical Assessment****Prerequisites:** Permission**Description:** Introduction to the theory and application of assessment procedures and techniques. Measurement and interpretive issues in clinical assessment. Laboratory introduction to structured techniques emphasizing intellectual assessment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 956 Clinical Assessment Techniques****Prerequisites:** PSYC 955 or permission**Description:** Didactic and laboratory training in the administration, scoring, and beginning interpretation of projective and objective assessment techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**PSYC 957 Topics in Clinical Assessment****Prerequisites:** PSYC 955 and 956 and permission, or equivalent advanced training and permission**Description:** A selected topic taught during the course. Examples include clinical neuropsychology, assessment techniques and assessment batteries, individual case conference presentation, and assessment of sexual dysfunctions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

PSYC 958 Seminar in Dispositional Assessment

Prerequisites: PSYC 955 and 956 or permission

Description: Advanced interpretation, issues, and research in clinical psychology assessment. Emphasis on the "dispositional assessment" model of clinical analysis. Student presentations and individual case interpretation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 960 Seminar in Alcohol Use and Abuse

Prerequisites: Permission

Description: Biopsychosocial perspective of alcohol abuse. Focus on multiple factors that contribute to alcohol problems, including physiological/genetic, psychological and sociocultural determinants. Intervention, treatment and prevention issues. Societal and governmental attitudes and policies. Emphasis on theoretical and empirical literature bearing on the above areas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 961 Psychology of Decision Making

Description: Psychological, economic, and biological perspectives on decision making in humans and nonhuman animals. Examines the role of psychological mechanisms including learning, memory, heuristics, emotions, and theory of mind in decision-making contexts such as probability judgments, risky choice, intertemporal choice, and cooperation. Includes biological component examining an evolutionary perspective on decision making.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 963 Group Processes and Group Psychotherapy

Prerequisites: Open to students in community-clinical psychology or permission

Description: Group phenomena which are relevant to mental health service providers. Incorporates both didactic and experiential teaching of group process and group outcome issues. Focus on group process issues in group therapy (using the group concepts of Yalom and other writers) and experiencing these concepts in a training group.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 970 Clinical Interviewing

Prerequisites: Admission to the community-clinical psychology program

Description: Basic skills needed in seeing a mental health client (e.g., listening, empathy, reflection and restatement) explored through didactic, group interaction and live individual interviews. Focus is preparing the student to meet their first psychotherapy client in a competent manner. Doing observing and rating pseudo and patient interviews.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 971 Psychological Literature I

Description: Reading assignments in special fields; library reading, conferences.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

PSYC 972 Psychological Literature II

Description: Reading assignments in special fields; library reading, conferences.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

PSYC 974 Teaching Methods for Psychology

Prerequisites: Permission

Description: Teaching methods, philosophical perspectives to teaching, practical ideas about classroom instruction, and career issues in higher education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 975 Advanced Experimental Psychology

Prerequisites: Permission

Description: Typical refinements of controlled investigations. General methodology and practice in carrying out a few prolonged experiments.

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 9

Format: LEC

PSYC 976 Psychology of Race and Ethnicity

Description: Theoretical and practical implications for the impact of race and ethnicity on psychological processes and functioning. The meaning of race and ethnicity for notions of self, identity acquisition and maintenance, intra- and inter-group processes, measurement of biases and discrimination. Methods to improve the treatment of race and ethnic issues within the field of psychology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 979 Cultural Diversity in Psychology

Prerequisites: Permission

Description: Influence of culturally driven world-views on psychological functioning and on psychological theory. American psychological theory, research and practice influenced by the socialization and world-views of the contributing psychologists. Ways in which existing theory and practice accommodate—or fail to accommodate—the world-views and experiences of racial/ethnic minorities in the contemporary United States.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 981 Clinical Intervention I

Prerequisites: Graduate standing in clinical psychology training program or permission of director of clinical training

Description: Practical and didactic training in assessment and intervention for psychological and behavioral disorders. Emphasis on entry-level clinical skills including establishment of the therapeutic relationship, case conceptualization, and development of treatment plans within the scientist-practitioner model.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 982 Clinical Intervention II

Prerequisites: PSYC 981 and either graduate standing in clinical psychology training program or permission of director of clinical training

Description: Practical and didactic training in assessment and intervention for psychological and behavioral disorders. Emphasis on conceptualization of more complex cases, assessment and treatment of a broader range of cases, and evaluation of efficacy of interventions within the scientist-practitioner model.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 983 Therapy in Clinical Psychology I

Prerequisites: Permission

Description: Theory and methods employed by different "schools" of therapy analyzed and related to basic psychological theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 985 Law and Behavioral Science

Description: Examines actual and potential uses of social scientific research findings and theories in the law and the methods for evaluating the quality and application of social scientific evidence. The uses of social scientific evidence to determine facts, to make law, to provide contextual background for legal decisions, to plan litigation and to assess the functioning of the legal system are examined in a variety of substantive areas. Topical coverage includes: establishing community standards in obscenity cases, the death penalty, research ethics, explaining and predicting behavior, jury decision making, eyewitness reliability and pretrial publicity.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

PSYC 986 Child Psychopathology and Assessment

Prerequisites: Advanced graduate standing and permission

Description: Major categories of child psychopathology, theoretical formulations of etiology of such disorders, empirical findings and issues related to each disturbance and appropriate instruments for assessing each disorder.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 987 Child Therapy

Prerequisites: Advanced graduate standing and permission

Description: Various child intervention techniques with an emphasis on behavioral parent training for child noncompliance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 988 Mental Health Law

Description: Addresses both civil and criminal issues that are likely to arise in practice. These include: civil competence for a variety of purposes; civil guardianship and conservatorship; civil commitment; confidentiality and privilege; health care provider liability in the context of mental health care; competence to proceed at several stages of the criminal process; criminal responsibility; and criminal sentencing. Critical review of the mental health laws throughout the nation and their psychological foundations. Emphasis on the research that illuminates the problems facing mental health law, system, and processes and the available solutions. Includes the insanity defense, competency to stand trial, guardianship, conservatorship, and civil commitment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

PSYC 989 Topics in Law and Psychology I

Description: In-depth analysis of specific psycholegal topics. Previous course titles have included Aging and the Law, Eyewitness Testimony, Privacy, Mental Health Policy, Legal Decision Making, Jurors/Jury Decision Making, Institutional Reform and Deinstitutionalization, Legal Policy and Child Development, Domestic Violence, Psychological Testimony in Criminal Cases: Battered Women's Cases, Expert Evidence, Children and the Law, and Psychology and Family Law.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL/SPR

PSYC 990 Practicum in Teaching Methods for Psychology

Prerequisites: PSYC 974 and permission

Description: Students will contract with instructor to teach an undergraduate psychology course under supervision. Individual instruction on teaching methods, classroom assessment, and practical classroom techniques.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

PSYC 991 Research Methods in Social and Personality Psychology

Prerequisites: Permission and second-year graduate standing; at least 1 sem graduate-level statistics

Description: Research design and the application of design to real research problems, including the application of statistics, problems of control, confounding, alternative explanations, demand characteristics, and experimenter effects. In addition to readings in theory of design and experimentation, the practical solution of design problems and critique of research are emphasized.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 992 Field Methods in Psychology

Prerequisites: Second-year graduate standing and permission

Description: Design and implementation of field research, including observational methods, experimental and quasi-experimental designs, and program evaluation. In addition to readings in the theory of field research methodology, the solutions to specific, commonly occurring design and statistical problems are emphasized.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 993 Seminar in Program Evaluation

Description: Major issues involved in the evaluation of programs which deliver human services. Includes needs assessments, outcome evaluation techniques, qualitative methods, goal attainment scaling, multi-attribute utility theory, role relationships and political problems with which evaluators must contend.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

PSYC 995 Psycholegal Research Other than Thesis I

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: IND

Offered: ALL

PSYC 995A Psycholegal Research Other than Thesis II

Description: A substantial research and writing project on a psycholegal topic. The research is supervised and approved by a faculty member in the Law/Psychology program.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: IND

Offered: ALL

PSYC 996 Research Problems Other Than Thesis

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: IND

PSYC 997 Clinical Practicum

Prerequisites: Full graduate standing in clinical psychology training program or permission of director of clinical training

Description: Individually supervised evaluative and diagnostic work with clinic subjects. Emphasis on the refinement of skills in evaluating and diagnosing behavior deviations.

Credit Hours: 1-30

Min credits per semester: 1

Max credits per semester: 30

Max credits per degree: 30

Format: IND

PSYC 998 Practicum in Law and Psychology

Prerequisites: Full graduate standing in Law/Psychology Graduate Training Program or permission of the director of the Law/Psychology Program

Description: Supervised fieldwork in law and psychology. Emphasis on the integration of legal analysis and psychological research in the formulation or implementation of public policy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: IND

PSYC 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Raikes School of Computer Science and Management (RAIK)

RAIK 802 RAIK: DSGN STUDIO I

Crosslisted with: GRBA 802

Prerequisites: Admission to the MBA program; BSAD/CSCE/RAIK 402H

Description: The first semester of a two semester sequence of the Raikes School of Computer Science and Management Graduate Design Studio. Application of software design principles in a team oriented project management setting. Complete projects in consultation with private and public sector clients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RAIK 803 Raikes School: Design Studio II

Crosslisted with: GRBA 803

Prerequisites: Admission to the MBA program; GRBA/RAIK 802

Description: The second semester of a two semester sequence of the Raikes School of Computer Science and Management Graduate Design Studio. Application of software design principles in a team oriented project management setting. Complete projects in consultation with private and public sector clients.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Religious Studies Program (RELG)

RELG 806 Second Temple Judaism

Crosslisted with: JUDS 406, RELG 406

Description: An in-depth study of the literature, history and culture of Judea and the Jews in the Second Temple period, from 550 BCE to 70 CE. Readings include apocalyptic texts, Wisdom literature, and selections from the Dead Sea Scrolls.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: JUDS 308, RELG 308

RELG 826 Reformation Thought

Crosslisted with: HIST 426, HIST 826, MODL 426, MODL 826, MRST 426, MRST 826, RELG 426

Prerequisites: Junior standing

Description: Life and thought of significant figures and schools of thought in the Reformation period

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Pre-1800 History

RELG 889 Medieval Literature and Theology

Crosslisted with: ENGL 489, ENGL 889, RELG 489

Description: The relationship between significant medieval theologies and primary medieval poets and prose masters.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

Russian (RUSS)

RUSS 803 Russian Grammar and Stylistics

Crosslisted with: RUSS 403

Prerequisites: RUSS 301, 302, 303 or 304

Description: Detailed analysis of Russian morphology and syntax to achieve greater sophistication in self-expression.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RUSS 841 Advanced Literary Analysis

Crosslisted with: RUSS 441

Prerequisites: RUSS 301, 302, 303 or 304

Notes: All the readings, discussions, and assignments are in Russian. See instructor if you believe an equivalent course(s) may count for prerequisite.

Description: In-depth study of a work, period, or genre with emphasis on textual analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RUSS 842 Russian Poetry

Crosslisted with: RUSS 442

Prerequisites: RUSS 301, 302, 303 or 304.

Notes: See instructor if you believe an equivalent course(s) may count for prerequisite.

Description: Russian poetry of the nineteenth and twentieth centuries. Teaches poetry appreciation and acquaints them with the culture, history and philosophy of the country through poetry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RUSS 854 Russian Intellectual Tradition

Crosslisted with: MODL 454, MODL 854, RUSS 454

Prerequisites: Junior standing.

Description: Major Russian thinkers from 1700 to the present. Focus on the evolution of ideas in the Russian context and the relationship between Russian and European thought.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RUSS 883 Russian Literature in Translation II

Crosslisted with: RUSS 483

Prerequisites: Junior standing.

Description: Survey of twentieth-century Russian literature, to include works by Babel, Blok, Bely, Zamyatin, Bulgakov, Zoshchenko, Gorky, Sholokhov, Pasternak, Solzhenitsyn, and Rasputin. Prepares students to appreciate literature and acquaint them with Russian literature, culture and philosophy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

RUSS 898 Special Topics in Russian

Prerequisites: RUSS 301 and 302.

Description: Language, literature, and civilization.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Science Literacy (SCIL)

SCIL 800 Experiential Learning in Food, Energy and Water Systems II

Crosslisted with: SCIL 400

Prerequisites: 15 hours of coursework towards the Food, Energy, and Water in Society Minor including SCIL 300 (at the 400 level) or 12 hours of graduate coursework (at the 800 level).

Description: A multifaceted experience that serves as a culminating academic and intellectual experience for students. Students will complete an internship or a research project in an approved professional or academic setting that will provide them with a challenging and engaging experience. As part of this experience, students will cater knowledge and skills from the minor as appropriate for a professional career, begin to build a network for support and future employment, and clarify individual professional goals and strategies for career development. The experience will culminate in the development of a creative product that illustrates the students' knowledge and skills relevant to food, energy, and/or water systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

Prerequisite for: SCIL 300

SCIL 888 Teaching Undergraduate Science

Crosslisted with: AGRI 888, AGRI 488, SCIL 488

Description: The dynamics of undergraduate student learning. Begin to develop the reflective practice of progressive instructional improvement. Interpreting improved educational outcomes in terms of the ability of the instructor to manipulate undergraduate student interactions with instructional materials in an active learning environment.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Offered: FALL

Social Work (SOCW)

SOCW 803 Social Work with Hispanics

Crosslisted with: SOCW 403

Prerequisites: SOCW 332; Admission to the BSSW Program.

Notes: For social work students, the course meets the minority or social work elective requirement.

Description: Develops students' awareness, familiarity and understanding of some of the social conditions and cultural traits of the Hispanic community, with special emphasis on Mexican-Americans. This course will be the foundation for the adaptation of the social worker's practice to meet the needs of this ethnic community.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Sociology (SOCL)

SOCL 807 Strategies of Social Research: Qualitative Methods

Crosslisted with: SOCL 407

Description: Systematic review and application of qualitative research methods, including participant observation, unstructured interviewing, audiovisual techniques and personal document analysis; data collection and interpretation emphasized as well as different theoretical assumptions underlying their various approaches.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SOCL 818 Data Collection Methods

Crosslisted with: SRAM 818

Description: Effects of various data collection methods on survey errors. The strengths, weaknesses, and challenges of data collection modes and mixed-mode methods. Processes underlying data collection and practical challenges that arise with each mode; coverage error; nonresponse error; interviewer effects and training; timing; and mode effects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SOCL 819 Applied Sampling

Crosslisted with: SRAM 819

Description: Design of probability samples, sampling populations of humans and unique challenges posed by such populations, restricted by cost and available sampling frames. Simple random sampling, stratification, cluster sampling, systematic sampling, multistage sampling, and probability proportional to size sampling, area probability sampling, and telephone samples.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SOCL 835 Mass Communication

Crosslisted with: SOCL 435

Prerequisites: 9 hours of SOCL, or Senior standing.

Description: Analysis of the structure and effects of the media of mass communication.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SOCL 842 Personality and Social Structure

Crosslisted with: SOCL 442

Prerequisites: 9 hours of SOCL, or Senior standing.

Description: Personality and the sociocultural environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SOCI 843 Sociology of Mental Health**Crosslisted with:** SOCI 443**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Social origins of mental health and illness; social distribution of mental health by race, class, and gender; social construction of mental health; mental health care systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 844 Population Dynamics****Crosslisted with:** SOCI 444**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Historical and cross-cultural approach to population issues by linking changes in fertility and mortality to social institutions. Focuses on the link between population processes and such issues as gender roles, the role of the family, the Third World, and poverty and inequality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 848 Family Diversity****Crosslisted with:** ETHN 448, SOCI 448, ETHN 848**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Analyzes diversity in family structure and family choices. Includes: rural families, gay/lesbian families, Native American families, African American families, Latino families, working class and working poor families and cohabitation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 849 Perspectives on Families****Crosslisted with:** SOCI 449**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Sociological perspectives on marriage and different family types. Focuses on formation and organization of families, and issues confronting families. Emphasizes contemporary research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 852 Sociology of Religion****Crosslisted with:** SOCI 452**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Consideration of sources and nature of religion, drawing on contributions of anthropologists, sociologists, psychologists, and others. Emphasis on interaction of religion and society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 854 Physical Health Disparities****Crosslisted with:** SOCI 454, ETHN 454**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Contribution of social inequality to health outcomes; Intersection of individual and social factors through which racial, economic, and gender differences in health emerge.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 855 History of Sociological Theory****Crosslisted with:** SOCI 455**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Survey of the nineteenth- and early twentieth-century writers whose ideas have had a strong impact on the development of contemporary sociology and sociological theories. Emphasis on the work of such persons as Karl Marx, Emile Durkheim, Max Weber, George Herbert Mead, and Georg Simmel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 860 Education and Society****Crosslisted with:** SOCI 460**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Analysis of education as a social institution and its relationship to other institutions, e.g., economy, polity, religion, and the family. Emphasizes the role of the educational institution as an agent of stability and change. Emphasis on research and policy evaluation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 862 Basic Regression Analysis****Crosslisted with:** SRAM 863**Description:** The logic and techniques of sociological data analysis: use statistical software to run linear regression analyses and assess violations of regression assumption; the development of theoretically driven models; and the interpretation of results from linear regression analyses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 863 Advanced Social Research Methods****Description:** The logic and design of sociological research: the nature of science and logic of social inquiry; epistemic relations; design of research problems; data collection techniques and sampling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 864 Sociological Theory****Description:** The conceptual structures of selected theorists and of the basis of theory construction and testing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SOCI 865 Survey Design and Analysis**Crosslisted with:** SOCI 465, SRAM 465, SRAM 865**Prerequisites:** SOCI 205 and SOCI 206.**Description:** Basic issues related to the design and analysis of sample surveys. The basics of questionnaire construction, sampling, data collection, analysis and data presentation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 866 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, ANTH 479, ANTH 879, ECON 866, GEOG 448, GEOG 848, HIST 479, HIST 879, SOCI 466**Prerequisites:** Senior standing and permission.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Integrative Courses, Research Comp Intrntnl & Reg Developmnt Human-Economic Geography International Relations&Compar Variable group based on topic**SOCI 867 Advanced Regression Analysis****Description:** Multiple linear regression analysis (extending the analytic framework) to include non-normal and limited dependent variables with a focus on sociological problems and statistical software applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 870 Sociology of Occupations and Professions****Crosslisted with:** SOCI 470**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Presentation of frameworks for occupations and professions; analysis of occupational structure and mobility in American society and its relation to adult socialization and career development; occupational and professional associations and society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 871 Human Sexuality and Society****Crosslisted with:** CYAF 471, EDPS 471, PSYC 471, SOCI 471, CYAF 871, EDPS 871, PSYC 871**Prerequisites:** Junior standing.**Notes:** Open to advanced students planning careers in the professions in which knowledge of human behavior and society is important (e.g., helping professions, medicine, law, ministry, education, etc.).**Description:** Interdisciplinary approach to the study of human sexuality in terms of the psychological, social, cultural, anthropological, legal, historical, and physical characteristics of individual sexuality and sex in society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 874 Sociology of Deviance****Crosslisted with:** SOCI 474**Prerequisites:** 9 hours of SOCI, or Senior standing.**Notes:** CRIM 413 and SOCI 474 cannot both be applied toward the degree.**Description:** Theory and empirical research on conformity and deviance. Survey of the development of scholarly thinking on the nature and sources of deviance, societal reactions to deviance, and processes of social control.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOIL 475, WATS 475, AGRO 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, MSYM 475, MSYM 875, POLS 475, POLS 875**Prerequisites:** Senior standing.**Notes:** Capstone course.**Description:** Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** American Government&Public Pol**SOCI 878 Pro-seminar in Latin American Studies****Crosslisted with:** ANTH 478, GEOG 478, HIST 478, LAMS 478, POLS 478, SOCI 478, MODL 478, EDPS 478, ANTH 878, GEOG 878, HIST 878, POLS 878, MODL 878, EDPS 878**Prerequisites:** Junior standing and permission.**Notes:** Topical seminar required for all Latin American Studies majors.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**Groups:** Integrative Courses, Research Regional Geography Lat Am,Asian,Middle East Hist International Relations&Compar**SOCI 880 Social Inequality: Stratification and Life Chances****Crosslisted with:** SOCI 480**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Structured inequalities, including social class, race/ethnicity, gender and age stratification. The intersections of these as institutionalized inequalities examined for their causes and effects on individuals and groups. Emphasis on the role of social power, economic resources and occupational structures in the nature of inequality and social mobility in the United States.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SOCI 881 Minority Groups**Crosslisted with:** ETHN 481, SOCI 481, ETHN 881**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Systematic examination of racial, ethnic, and other minority groups. History and present status of such groups, the origins of prejudice and discrimination, and the application of social science knowledge toward the elimination of minority group problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 890 Sociology of Gender****Crosslisted with:** SOCI 490, WMNS 490, WMNS 890**Prerequisites:** 9 hours of SOCI, or Senior standing.**Notes:** SOCI 200 is strongly recommended.**Description:** Evaluation and application of scholarly theory and research on gender in societal context. The nature and effects of sex stratification, gendered culture, institutionalized sexism, feminist theory and sociology of knowledge.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 891 Political Sociology****Crosslisted with:** SOCI 491**Prerequisites:** 9 hours of SOCI, or Senior standing.**Description:** Application of sociological analysis to the problem of power; power structures and elite formation as they relate to democratic society and political extremism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 897 Fieldwork in Sociology****Prerequisites:** Permission**Description:** Opportunity to apply concepts and methods in field setting and to obtain experience that will be valuable preparation for professional assignments in research, policy analysis, and administration.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** FLD**SOCI 898 Special Topics****Crosslisted with:** SOCI 498**Prerequisites:** Permission.**Notes:** See course description or registration guide. Topic for the term announced prior to early registration.**Description:** Wide variety of different topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**SOCI 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**SOCI 901 Seminar in Sociological Theory****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 902 Seminar in Research Methods****Crosslisted with:** SRAM 902**Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 903 Seminar in Health****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 904 Seminar in Family****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 905 Seminar in Stratification, Class, and Inequality****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 906 Seminar in Race and Ethnicity****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 907 Seminar in Sex and Gender****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 908 Seminar in Crime and Deviance****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC

SOCI 921 Total Survey Error**Crosslisted with:** SRAM 921**Description:** Common language of survey errors across social science disciplines. Causes of survey coverage, nonresponse, measurement, and processing errors; techniques used to reduce the error in practice; and statistical models and designs that exist to measure the error. Implications of cost and trade-offs between error sources.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 947 Questionnaire Design****Crosslisted with:** PSYC 947, SRAM 947**Description:** Design of questionnaires for survey research and the theoretical and practical issues arising from them. Selection of appropriate measurement techniques for assessing opinions, past behaviors and events, and factual material.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 995 Seminar in Professional Development****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Format:** LEC**SOCI 995A Teaching****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**SOCI 995B Graduate Study and Career Research****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**SOCI 995D Publications Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SOCI 996 Research Other Than Thesis****Prerequisites:** Permission**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** IND**SOCI 998 Special Topics Seminar****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**SOCI 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Spanish (SPAN)

SPAN 803 Syntactic Structures of Spanish**Crosslisted with:** SPAN 403**Prerequisites:** SPAN 317 or equivalent.**Description:** Comparative study of the structure of complex sentences in Spanish and English: Translation and composition.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 805 Advanced Grammar****Crosslisted with:** SPAN 405**Prerequisites:** SPAN 317 or equivalent.**Description:** Theoretical and practical aspects of Spanish grammar.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 807 History of the Spanish Language****Crosslisted with:** SPAN 407**Prerequisites:** SPAN 317 and SPAN 319, or equivalent.**Description:** Changes in the sound system, evolution of morphological paradigms and general patterns of semantic change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 821 Medieval Literature****Crosslisted with:** SPAN 421**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Examination of important forms and themes in the history of Spanish Medieval literature. Emphasis on the impact of digital tools on the humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 832 Spanish Speaking Proficiency****Crosslisted with:** SPAN 432**Prerequisites:** SPAN 300.**Description:** Intensive advanced course in oral communication to gain proficiency in speaking Spanish through practice, creative construction of sentences, vocabulary building, and practical review of grammar and pronunciation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SPAN 841 Golden Age Poetry**Crosslisted with:** SPAN 441**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Examination of important forms and themes in the history of Spanish Golden Age Poetry. Emphasis on the impact of digital tools on the humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 842 Golden Age Prose****Crosslisted with:** SPAN 442**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Examination of important forms and themes in the history of Early-Modern Spanish Prose. Emphasis on the impact of digital tools on the humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 845 Golden Age Drama****Crosslisted with:** SPAN 445**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Examination of important forms and themes in the history of Early-Modern Spanish Drama. Emphasis on the impact of digital tools on the humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 853 Nineteenth-Century Spanish Literature****Crosslisted with:** SPAN 453**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Reading and study of nineteenth-century Spanish literature: drama, essay, novel, poetry, and short story. Such authors as Larra, Zorrilla, Duque de Rivas, Espronceda, Tamayo y Baus, Echegaray, Bécquer, Pérez Galdós, Clarín, and Valera.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 855 Human Rights in Latin America****Crosslisted with:** SPAN 455**Prerequisites:** SPAN 305 and six additional hours from SPAN 311, SPAN 312, SPAN 314, SPAN 315.**Description:** Reading and analysis of Latin American texts dealing with human rights issues. Topics selected from the Universal Declaration of Human Rights.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 856 Twentieth and Twenty-first Century Spanish****Crosslisted with:** SPAN 456**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Reading and analysis of Spanish poetry, with emphasis on A. Machado, Unamuno, Salinas, J. Guillén, García Lorca, and M. Hernández.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 857 Twentieth and Twenty-first Century Spanish Narrative****Crosslisted with:** SPAN 457**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Reading and analysis of significant Spanish narratives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 858 Twentieth and Twenty-first Century Spanish Drama****Crosslisted with:** SPAN 458**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Reading and analysis of dramas written by such playwrights as Benavente, Valle-Inclán, García, Lorca, Buero Vallejo, Sastre, and Arrabal.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 859 Spanish-American Poetry****Crosslisted with:** LAMS 459, SPAN 459**Prerequisites:** 6 hrs from: SPAN/LAMS 311, SPAN/LAMS 312, SPAN 314, SPAN 315.**Description:** Spanish-American poetry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 860 Spanish-American Novel****Crosslisted with:** LAMS 460, SPAN 460**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Spanish-American novels.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 862 Spanish-American Short Story****Crosslisted with:** LAMS 462, SPAN 462**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Masterpieces of the Spanish-American short story from its origins. Works of the twentieth century by authors such as Horacio Quiroga, Jorge Luis Borges, María Luisa Bombal, Juan Rulfo, Julio Cortázar, Rosario Castellanos, and Luisa Valenzuela.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SPAN 863 Twentieth and Twenty-first Century Spanish and Spanish-American Essay**Crosslisted with:** SPAN 463**Prerequisites:** 6 hrs from SPAN 311, 312, 314, and/or SPAN 315.**Description:** Reading and analysis of Spanish and Spanish-American essays, with emphasis on Unamuno, Maeztu, Ortega y Gasset, Marañón, Marías, Picon Salas, Arciniegas, Mañach, Reyes, and Paz.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 870 Women Writers of Spanish America****Crosslisted with:** LAMS 470, SPAN 470**Prerequisites:** 6 hrs from: SPAN/LAMS 311, SPAN/LAMS 312, SPAN 314, SPAN 315.**Description:** Masterpieces by women writers of Spanish America such as Sor Juana Ines de la Cruz, Gertrudis Gomez de Avellaneda, Gabriela Mistral, Maria Luisa Bombal, and Victoria Ocampo.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 873 Don Quixote and the Birth of the Modern Novel****Crosslisted with:** SPAN 473**Prerequisites:** SPAN 305; and SPAN 311 or SPAN 312 or SPAN 331; and SPAN 314 or SPAN 315 or SPAN 321.**Description:** Examination of Cervantes's masterpiece in its literary and social context. Emphasis on the impact of digital tools on the humanities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 875 Advanced Translation for the Professions****Crosslisted with:** SPAN 475**Prerequisites:** Senior standing**Description:** Theory and practice of translation in professional settings. Introduction to linguistic and cultural challenges of Spanish/English, English/Spanish translation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 878 Introduction to the Digital Analysis of Hispanic Culture****Crosslisted with:** SPAN 478**Prerequisites:** SPAN 305; and SPAN 317; and SPAN 321 or SPAN 331**Description:** Shift from printed to digital texts and its implications for the humanities. Definitions of digital research, various theoretical and methodological approaches, and the consequences for the academy, publishers, classrooms, and libraries. Analysis of representative electronic projects related to Hispanic literature and culture. Design of a digital humanities research projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 896 Independent Study in Spanish****Crosslisted with:** SPAN 496**Prerequisites:** Permission.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**SPAN 898 Special Topics in Spanish****Crosslisted with:** SPAN 498**Prerequisites:** SPAN 305; and SPAN 317; and SPAN 321 or SPAN 331**Description:** Language, literature, and civilization.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**SPAN 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**SPAN 925 Generation of 1898****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 942 Golden Age****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 943 Colonial Spanish America****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 952 Spanish Medieval Literature****Prerequisites:** Permission**Description:** Medieval Spanish literature. Seminars in Spanish Under the headings listed below the works of one author, or a group of works centering in a period, or those illustrating the development of a literary age are studied with respect to content, sources, style, and influence.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 957 Literary Movements****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SPAN 990 Twentieth and Twenty-first Century Spanish Studies**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 991 Special Topics****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Format:** LEC**SPAN 993 Contemporary Spanish America****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPAN 996 Research Problems in Spanish****Prerequisites:** Permission and successful completion of a graduate seminar Individual research on a literary or linguistic problem involving original investigation in areas not covered by seminars or thesis**Credit Hours:** 1-8**Min credits per semester:** 1**Max credits per semester:** 8**Max credits per degree:** 8**Format:** IND**SPAN 997 Directed Readings in Spanish****Prerequisites:** Permission**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** IND**SPAN 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Special Education (SPED)

SPED 801A Accommodating Exceptional Learners in the Elementary School Classroom**Crosslisted with:** SPED 401A**Prerequisites:** Admission to the Teacher Education Program; EDPS 362; one methods course; or permission.**Description:** Legal and ethical requirements for educating exceptional learners; identification, referral, and placement procedures; development and use of the Individual Education Program; strategies for teaching and accommodating academic and behavior of a range of exceptional and other at-risk learners in the elementary school.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 472**SPED 801B Accommodating Exceptional Learners in the Secondary School Classroom****Crosslisted with:** SPED 401B**Prerequisites:** Admission to the Teacher Education Program; EDPS 362; one methods course; or permission.**Description:** Legal and ethical requirements for educating exceptional learners; identification, referral, and placement procedures; development and use of the Individual Education Program; strategies for teaching and accommodating academic and behavior of a range of exceptional and other at-risk learners in the secondary school.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 472**SPED 802 Advanced Assessment Techniques****Prerequisites:** SPED 800 or equivalent**Description:** Comprehensive study of criterion-referenced and normative-referenced assessment instruments used by school resource personnel.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 803; SPED 804**SPED 803 Effective Instruction for Learners with Special Needs****Prerequisites:** SPED 800 and 802**Description:** Interaction of classroom-based assessment and effective instructional strategies for use with individual and group formats. Development of individual education plans, curriculum analysis, delivery of instruction, curriculum-based measurement, and specific and generic instructional strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 804; SPED 932**SPED 804 Managing Challenging Behavior****Prerequisites:** SPED 800, 802, 803**Description:** Functional approaches that can be used by teachers and mental health practitioners for assessing, preventing, and managing children's challenging behavior. Basics of applied behavior analysis, functional analyses of behavior, individual- and group-oriented interventions, self-management training, and strategies for promoting generalization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 805 Code-based Reading Instruction****Crosslisted with:** SPED 405**Prerequisites:** Parallel SPED 405A/805A.**Description:** Direct, systematic, multi-sensory techniques for teaching reading, writing and spelling to students who have severe reading problems.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC

SPED 805A Reading Center Practicum I**Crosslisted with:** SPED 405A**Prerequisites:** Permission.**Description:** Teaching and/or tutoring experience evaluating and instructing students with reading problems in a Reading Center. Assessment, lesson planning and teaching using direct instruction, code-based instructional strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**Prerequisite for:** SPED 405, SPED 805**SPED 806 Reading and Writing Disabilities: Adolescents****Crosslisted with:** SPED 406, TEAC 806**Prerequisites:** SPED 212 and TEAC 441 (required for undergraduate students only). Parallel with SPED 406A/806A.**Description:** Theory and techniques for assessing and teaching word identification, vocabulary, comprehension and writing skills in grades 7 to 12.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SPED 806A Reading Center Practicum II****Crosslisted with:** SPED 406A, TEAC 806A**Prerequisites:** SPED 212 and TEAC 441 (required for undergraduate students only). Parallel with SPED 406/806.**Notes:** Requires two hours per week in a Reading Center.**Description:** Teaching and/or tutoring experience evaluating and instructing students with reading problems in a Reading Center. Assessment, instructional planning, delivery of instruction, writing diagnostic reports and parent communication.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LAB**SPED 807 Foundations of Secondary Special Education****Description:** Provide future special education teachers with both the historical timeline and current legislation regarding services for students with mild/moderate disabilities. Chronological events and legal mandates that public schools must reinforce to provide an equal education for all students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 408, SPED 808**SPED 808 Methods and Instruction for Secondary Special Education****Crosslisted with:** SPED 408**Prerequisites:** SPED 407 or 807.**Description:** Instill practices of "Explicit Instruction" and a framework for instructional planning. Provide a practicum experience for future teachers to practice their knowledge and skills on a weekly basis in a secondary school setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 809 Autism Spectrum Disorders (ASDs): Effective Assessment and Intervention****Description:** Designed for educators of children and youth with Autism Spectrum Disorders (ASDs) in school setting. Assessment strategies to identify characteristics of ASDs focused on individual needs and strengths-based outcomes. Knowledge and skills regarding evidence-based practices and individualized educational programs. Requires observations in schools and applied assignments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 810**SPED 810 Autism Spectrum Disorders (ASDs): Methods and Program Planning****Prerequisites:** SPED 809 or equivalent**Notes:** Majors in severe disabilities must parallel with SPED 896P (1 cr). SPED 810 requires observations in schools and applied assignments.**Description:** Planning, implementing, and evaluating effective education for individuals with Autism Spectrum Disorders (ASDs). Uses an ecological approach to assess present levels of performance and individual characteristics. Apply assessment outcomes to develop functional outcomes, to select instructional strategies, and utilize empirically-based interventions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 813 Instructional Methods for Students with Diverse Needs****Description:** Instructional methods and accommodations for special education and general education teachers necessary to work successfully with students with disabilities or who are at-risk for academic failure. Curriculum modification, classroom management, strategy instruction, and instructional modifications for content areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 833**SPED 814 Instructional Methods for Students with Mathematics Learning Disabilities****Crosslisted with:** SPED 414**Prerequisites:** SPED 201; sophomore standing.**Description:** Understanding characteristics of students with math learning disabilities and potential causes. Evidence-based instructional strategies in math for teaching students with math learning disabilities and those who are at-risk.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR

SPED 815 Reading and Writing Disabilities: Elementary Students**Crosslisted with:** SPED 415**Prerequisites:** SPED 201, TEAC 311, TEAC 313 for elementary education majors; SPED 201, TEAC 416A, TEAC 416B, TEAC 397D for inclusive early childhood education majors; SPED 201, SPED 212, and SPED 414 (or equivalent) for SPED majors. Must be taken with: SPED 415A/815A.**Notes:** Priority will be given to students who will be student teaching the following semester.**Description:** Theory and techniques for assessing and teaching early literacy skills in small groups and one-on-one for children who struggle with literacy.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SPED 815A Practicum in Reading and Writing Disabilities-Elementary****Crosslisted with:** SPED 415A**Prerequisites:** SPED 201, TEAC 311, TEAC 313 for elementary education majors; SPED 201, TEAC 416A, TEAC 416B, TEAC 397D for inclusive early childhood education majors; SPED 201, SPED 212, and SPED 414 (or equivalent) for SPED majors. Must be taken with: SPED 415/815.**Notes:** Must be taken with: SPED 415/815. For SPED 415 students: Priority will be given to student who will be student teaching the following semester.**Description:** This reading and writing practicum is taken parallel with as SPED 415 or SPED 815**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LAB**Prerequisite for:** SPED 415, SPED 815; SPED 415A, SPED 815A**SPED 820 Mathematics Instruction for Diverse Learners****Prerequisites:** SPED 201**Notes:** SPED 820 and associated practicum is designed to meet professional standards (i.e., Council for Exceptional Children, Teacher Education Accreditation Council) for teachers in the area of instruction for diverse learners.**Description:** Supplemental basic skills and concepts instruction for diverse learners within a response to intervention models and on mathematics instruction. Selection, delivery, and evaluation of standard protocol and individualized interventions to diverse learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 824 Functional Behavioral Assessment****Prerequisites:** SPED 454 or equivalent. Admission to Graduate Degree or Certificate program in special education or by permission of instructor. Parallel SPED 824A.**Description:** Functional behavioral assessments (FBAs) and development of behavior intervention plans (BIPs) based on the assessments.

Contextual and curriculum manipulations, and replacement behavior training.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 942**SPED 824A Practicum in Functional Behavioral Assessment****Prerequisites:** SPED 454 or approved equivalent. Parallel SPED 824**Description:** Opportunities to engage in the activities and practice the skills associated with SPED 824. Culmination of the practicum is performing a complete functional behavioral assessment and developing a behavior intervention plan for a student who displays challenging behaviors.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** FLD**SPED 833 Behavioral Systems and Interventions****Prerequisites:** SPED 813 or equivalent**Description:** Three-tier models for encouraging and maintaining students' appropriate behaviors. Evaluation and implementation of interventions at the school-wide, classroom and/or small group, and individual levels. Presentation of different models i.e., Response to Intervention (RtI) and School-Wide Positive Behavior Support (SWPBS).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 834 Introduction to Special Vocational Needs****Crosslisted with:** SPED 434**Description:** A foundational course emphasizing the characteristics and identification of special needs learners in vocational settings. Determines needs, interests, and abilities of these students.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 436, SPED 836**SPED 836 Career Education for the Special Needs Student****Crosslisted with:** SPED 436**Prerequisites:** SPED 434/834.**Description:** Philosophical and practical base of career education as it relates to special needs students. Career education units developed for infusion into subject areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 841 Emotional and Behavioral Disorders****Prerequisites:** SPED 800**Description:** Etiology, theories and assessment of child and adolescent emotional and behavioral disorders. Addresses issues of definitions and classification (DSM-IV and special education) or deviant behavior and psychopathology, as well as an overview of service delivery systems in education and mental health.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SPED 843 Characteristics of Emotional & Learning Disorders

Prerequisites: SPED 400/800

Description: Learning, academic, behavioral, social-emotional and language characteristics of students who are classified as having disabilities for purposes of special education. Definitions, classification systems, assessment and verification criteria, and medications for students with learning and emotional disabilities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 846 Foundations of Visual Impairment: Programs and Services for Individuals with Visual Impairments

Prerequisites: Admission to visually impaired program; hold or concurrently earn subject/field endorsement.

Description: Current educational programs and services for children with visual impairments, as well as children with multiple disabilities. History of educational services, developmental characteristics, psycho-social aspects, history of legislation, and grade I Braille.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 847; SPED 849; SPED 851; SPED 852; SPED 852A; SPED 852B; SPED 853

SPED 847 Introduction to Eye Anatomy of Students with Visual Impairments

Prerequisites: SPED 846. Admission to Graduate Degree or Certificate program in Special Education

Description: Structure and function of the visual system, conditions that effect visual ability, and the functional and environmental implications of low vision. Strategies for enhancing visual ability in children with visual impairments and children who have additional disabilities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 849; SPED 851; SPED 852; SPED 852A; SPED 852B; SPED 853

SPED 849 Braille Codes and Material Adaptations for Students with Visual Impairments

Prerequisites: SPED 846 and 847.

Description: Basic skills in literary Braille transcription and codes. Acquire competence in reading and writing Braille and using the Perkins braillewriter and slate/stylus.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 851; SPED 852; SPED 852B; SPED 853

SPED 851 Intermediate Braille Codes & Instructional Material Adaptations for Students with Visual Impairments

Prerequisites: SPED 846, 847, and 849. Admission to Graduate Degree or Certificate program in Special Education

Description: Advanced skills in Nemeth (mathematics code) and/or Literary code. Basic activities in braille formatting, foreign language, music and identification of braille technology devices and resources.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 852; SPED 852B; SPED 853; SPED 908

SPED 852 Instructional Methods for Teachers of Students with Visual Impairments

Prerequisites: SPED 846, 847, 849, and 851. Admission to Graduate Degree or Certificate program in Special Education

Description: Methods and materials for educating children who are totally blind or have low vision, including students with multiple impairments. Practical skills in selecting, designing, and/or modifying materials for content area subjects: mathematics, science, social studies, creative arts, foreign language, and other subjects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 852B; SPED 853

SPED 852A Applied Technology Methods for Students with Visual Impairments

Prerequisites: SPED 846 and 847, or equivalents

Description: Theory and skill development in the selection and use of technology for students with visual impairments. Technology assessments, data collection, equipment feature, source of equipment, funding sources, writing technology instructional plans, and demonstration of using various equipment and technology.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

SPED 852B Applied Instructional Methods to Teach Students with Visual Impairments

Prerequisites: SPED 846, 847, 849, 851, and 852; or equivalents

Description: Practice using appropriate instructional methods and materials for educating the blind and low vision child.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SPED 853 Orientation and Mobility Skills for Students with Visual Impairments**Prerequisites:** SPED 846, 847, 849, 851, and 852.**Description:** Theory and applied practice in basic orientation and mobility techniques for use with students with visual impairments. Practical methods for work in concept development, orientation skills, travel skills and techniques, personal safety and independent travel. Needs of specific populations such as people with low vision and individuals with additional disabilities. Vision simulators and occluders. An introduction to the history and development of the profession.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 855 Teaching Learners to Learn****Crosslisted with:** EDAD 855, EDPS 855, NUTR 855, TEAC 855**Description:** Effective teachers facilitate student learning. Facilitating student learning depends on understanding learning principles and on designing instruction that is compatible with learning principles. Instructors can provide learning-compatible instruction that helps students learn more effectively and ultimately teaches them how to learn. Assists teachers to teach in learning-compatible ways and helps them embed within their curriculum a program for teaching learners to learn.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 856 Supervising Special Education****Crosslisted with:** EDAD 856**Description:** For principals or other administrators who have special education programs in their buildings. Overview of disabilities, related law, special education programs, personnel issues, etc., and instructional methods and administrative support for effective integration of disabled students into regular programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 857 Special Education Administration****Crosslisted with:** EDAD 857**Description:** Intensive preparation for special educators who intend to administer special education programs in the public schools. Information about best practices in special education, including programming, supervision, legal/regulatory issues, financing, personnel, as well as current controversial topics which are affecting these programs in the schools.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 858 Special Education Law****Crosslisted with:** EDAD 858**Description:** Body of law that pertains to the organization, administration, and implementation of special education programs in PreK-12 schools. Substantive and procedural rights of disabled students, and the authority and responsibility of states and school districts that are grounded in state and federal law.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 860 Issues in Early Childhood Special Education****Description:** Introduction to the history, philosophy, and research related to early intervention practices with children 0-5 years of age. Discussion of issues related to legal mandates, model programs, family involvement, integration, transitions, service delivery systems, teamwork and assessment for young children.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 861 Infants with Disabilities and Home Visiting****Prerequisites:** SPED 960. Admission to Graduate Degree or Certificate program in Special Education**Notes:** SPED 861 requires a practicum in home visiting.**Description:** Assessment and intervention strategies for developing appropriate early intervention programs for infants and toddlers with disabilities. Rationale and principles for conducting home-based, family-centered, and transdisciplinary services.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 908**SPED 862 Preschool Children with Disabilities in a Classroom****Prerequisites:** An assessment and behavior management course; and admission to Graduate Degree or Certificate program in Special Education**Notes:** SPED 862 requires an applied experience.**Description:** Selection, design and implementation of developmentally appropriate, activity-based interventions for preschool-age children with disabilities. Ecological assessments. Instructional factors, such as classroom environments, activity planning, selection, use and modification of strategies, home-school communications, and consulting to staff in inclusive settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SPED 882

SPED 863 Medically Fragile infants

Prerequisites: Major in Special Education, Speech-language Pathology or Child Youth and Family Studies. Senior status or permission of instructor.

Description: Unique needs, family-coping strategies, specialized medical staff and various health care settings for chronically ill infants, toddlers and preschool age children. Overview of etiology, characteristics and developmental implications of selected medical conditions related to developmental disabilities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 872 Psychology and Sociology of Deafness

Description: Education of the hearing and vision impaired including history of, professional roles in, and educational programming within this field. Social/psychological theories as related to the vision hearing impaired. Patterns of social/emotional development, psychological characteristics, issues of family stress and social adaptation and discussion of counseling techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 873; SPED 874

SPED 873 Deaf or Hard of Hearing: Content Methods

Prerequisites: SPED 872 and admission to Graduate Degree or Certificate program in Special Education.

Notes: SPED 873 is for all students in the hearing impaired program.

Description: Methods for teaching content areas (science, math, and social studies) to students who are deaf or hard of hearing, birth through 21. Adapting curricula and materials in these areas to meet the language and learning needs of students who are deaf or hard of hearing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 874 Deaf or Hard of Hearing: Language Arts & Literacy

Prerequisites: SPED 872 and admission to Graduate Degree or Certificate program in Special Education.

Description: Assessment instruments, curricula and instructional methods for developing language and literacy for children who are deaf or hard of hearing, birth through 21. Methods for coordinating speech, language and/or auditory training in the home and classroom with that in the speech and/or language therapy program, and connecting this to literacy development and strategies.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: FALL

SPED 875 Itinerant Teaching Methods for Students with Sensory Disabilities

Description: Methods for providing services for students with sensory disabilities, using itinerant and consultative models. Professional and parent in-service development, team-based problem solving, curriculum based pull-out services. Ecological assessment and management of deafness and vision related technology in inclusive settings. Supervision of interpreters and paraprofessionals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 876 Language Development for Teachers

Description: Introduction to the foundations of normal speech and language development and potential difficulties in both early stages and in the classroom. Analysis of child language samples. Strategies for explaining language development to parents and professional colleagues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 880 Educating Students with Intellectual and Developmental Disabilities

Crosslisted with: SPED 480

Description: Concepts related to history, definitions, identification, etiology, and assessment of students with intellectual impairments and developmental disabilities. Examine attitudes, assumptions, and stereotypes concerning persons with intellectual impairments and other developmental disabilities. Instructional methods, adaptations and teaming to provide individualized interventions and include students in least restrictive environments/general education settings. Applied assignments will be conducted in field experience and student teaching.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 881

SPED 881 Methods for Students with Intellectual and Severe Disabilities

Prerequisites: SPED 480/880

Notes: SPED 881 requires observations in schools and applied assignments.

Description: Planning, implementing, and evaluating effective longitudinal education for individuals with intellectual impairments and severe disabilities. Knowledge and skills regarding best practices within inclusive education settings for these learners emphasizing an ecological and functional model that addresses useful skills in current and future environments.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 882; SPED 908; SPED 980

SPED 882 Specialized Instruction for Students with Severe and Multiple Disabilities

Prerequisites: SPED 881 for Severely/Multihandicapped endorsement or SPED 862 for Preschool Handicapped endorsement. Majors in severe disabilities must parallel with SPED 896P. Admission to Graduate Degree or Certificate program in Special Education.

Notes: SPED 882 requires observations in schools and applied assignments.

Description: Selection, design, and implementation of best practice instruction for students with severe disabilities, multiple disabilities, or deaf-blindness.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 980; SPED 981

SPED 884 Speech and Language Development of the Hearing Impaired

Crosslisted with: SLPA 884

Description: Theories of speech and language development as they apply to hearing impaired children. Evaluation and intervention of speech and language with emphasis on maintenance of communicative skills.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 886 Assessment, Evaluation, and Instruction of At-Risk Readers

Crosslisted with: TEAC 886

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

SPED 886A Special Topics in Literacy Assessment

Crosslisted with: TEAC 886A

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 886B Internship in Literacy Assessment and Instruction

Crosslisted with: TEAC 886B

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

SPED 890 Workshop Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

SPED 892 Special Topics in Education

Crosslisted with: EDAD 892, EDPS 892, EDUC 892, TEAC 892, CYAF 892

Prerequisites: EDPS 859 or parallel; EDPS 859 or equivalent

Description: Aspects of education not covered elsewhere in the curriculum.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 893 Workshop Seminar

Crosslisted with: SPED 893H

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

SPED 893H Workshop Seminar

Crosslisted with: SPED 893

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

SPED 893N Workshop Seminar

Crosslisted with: TEAC 893N, EDAD 893N, EDPS 893N

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

SPED 895 Independent Study in Special Education

Prerequisites: Prior arrangements with faculty member and permission.

Description: Special research or reading project under direction of a staff member in the department.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: IND

SPED 896B Directed Field Experience: Behavior Disorders

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896D Directed Field Experience: Deaf/Hard of Hearing

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896E Directed Field Experience: General Special Education

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896J Directed Field Experience: Gifted/Talented

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896L Directed Field Experience: Learning Disabilities

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896M Directed Field Experience: Mildly/Moderate Disabilities

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896P Directed Field Experience: Severe Disabilities

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896Q Directed Field Experience: Early Childhood Special Education

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896T Directed Field Experience: Transition

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896V Directed Field Experience: Visual Impairments

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 896Y Directed Field Experience: Inclusion

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SPED 897B Student Teaching: Behavior Disorders

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897D Student Teaching: Deaf/Hard of Hearing

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897E Student Teaching: General Special Education

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897J Gifted/Talented

Crosslisted with: EDPS 897J

Prerequisites: Permission of instructor.

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897L Student Teaching: Learning Disabilities

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897M Student Teaching: Mildly/Moderate Disabilities

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897P Student Teaching: Severe Disabilities

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897Q Student Teaching: Early Childhood Special Education

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897V Student Teaching: Visual Impairments

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 15

Format: FLD

SPED 897Y Student Teaching: Inclusion**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 15**Format:** FLD**SPED 897Z Student Teaching: Multicultural Education****Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 15**Format:** FLD**SPED 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**SPED 907B Seminar in Special Education - Behavior Disorders****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907D Seminar in Special Education - Deaf/Hard of Hearing****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907E Seminar in Special Education - General Special Education****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907L Seminar in Special Education - Learning Disabilities****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907M Seminar in Special Education - Mildly/Moderate Disabilities****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907Q Seminar in Special Education - Early Childhood Special Education****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 907V Seminar in Special Education - Visual Impairments****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**SPED 908 Resource Consultation Services****Prerequisites:** SPED 800, and one of the following: 831, 851, 861, 881**Description:** Roles and functions of school resource personnel in serving as educational consultants to regular school staff.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 920 Writing for the Behavioral Sciences****Description:** Three primary purposes: 1) provide feedback on writing; 2) allow opportunities to review manuscripts submitted for publication; and 3) prepare a manuscript suitable for submission to a professional journal. Designed for advanced graduate students enrolled in doctoral studies in education or a related discipline.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 921 Grant Writing for the Behavioral Sciences****Description:** Designed for advanced graduate students in their second year of a doctoral program in special education, speech pathology, or a related discipline. Three primary purposes: 1) provide students the opportunity to learn about the grant writing process; 2) allow students the opportunity to write a personnel preparation grant; and 3) allow students the opportunity to write a research grant.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 922 Grants Management****Description:** The role of the Principal Investigator (PI) after a grant has been awarded, the responsibilities of a PI and discussion will focus on a variety of topics including budgeting, hiring and supervision of employees, and annual reporting. Learn how various university departments are involved in the management of a grant and what resources are available to assist them.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SPED 932 Cognitive Strategy Instruction****Prerequisites:** SPED 800, 803, and 831**Description:** How to implement cognitive strategy instruction with students learning difficulties. Practical model which allows students to successfully teach cognitive strategies. Metacognition, attribution training, and attention deficit disorders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SPED 942 Strategic Interventions for Students with Behavioral Needs

Prerequisites: SPED 824 or equivalent. Admission to Graduate Degree or Certificate program in Special Education or by permission of instructor.

Description: Strategic therapy structures and cognitive-behavioral interventions for school and clinical professionals dealing with students who present significant behavioral challenges. Issues in assessment, intervention, and consultation are addressed.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

SPED 942A Special Topics in EBD

Description: Strategic therapy techniques for assessment and treatment of EBD.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 954 School Mental Health and Behavior Interventions

Crosslisted with: EDPS 954

Description: Understanding of models for the delivery of mental health services in schools; and plan and deliver psychosocial interventions in school settings. Evidence-based interventions delivered at the classroom and school-wide levels emphasized with a three-tiered prevention model of service delivery appropriate for culturally and linguistically diverse students.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SPED 956 Language Study of Teachers of Deaf and Hard of Hearing (DHH)

Crosslisted with: SLPA 956

Prerequisites: Admission to Graduate Degree or Certificate program in Special Education or Speech-Language Pathology or by permission of instructor.

Description: Theoretical and practical aspects of American Sign Language (ASL) structure. Issues relevant to the use of sign language in education, written English as a second language, classroom discourse, and educational interpreting. Socio-lingual aspects of sign language among deaf and hearing individuals.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Offered: SUMMER

SPED 960 Family and School Collaboration in Special Education

Prerequisites: Professional experience or completion of one practicum and/or field experience with young children (birth to age 5) or other individuals age 5 to 21 years who have disabilities.

Description: Functions and interactions of both family and education systems. Impact of having a child with a disability on the normal and stressed family system. Promote family-professional partnerships in assessment and intervention for the child and/or student with an IFSP/IEP. Communication skills are reviewed and practiced for effective teaming among educators and for interviewing, consulting, collaborating and coaching with family members and other community team members.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: SPED 861

SPED 980 Assessment of Students with Severe, Sensory, and Developmental Disabilities

Prerequisites: SPED 881 and 882; and permission

Description: Designed to meet the needs of educators who conduct assessment of students with low incidence disabilities in school settings. Strategies emphasize assessing capabilities and needs in relationship to valued life outcomes. Processes of instructional outcomes. Some assessment conducted in schools and community settings. Learning outcomes individualized to match special education certification program.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SPED 981 Functional Assessment and Behavioral Support for Students with Severe Developmental Disabilities

Prerequisites: SPED 882 and permission. Majors in severe disabilities must parallel with SPED 896P (1 cr).

Notes: SPED 981 requires observation in schools and applied assignments.

Description: Assessment and intervention strategies for developing positive behavior support for students with severe disabilities or developmental disabilities who have challenging behavior. Rationale and principles for using an educative approach, functional behavior analysis, and a variety of individualized ecological and curricular interventions. Process of assessment conducted in school settings.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SPED 995 Doctoral Seminar

Prerequisites: Permission

Description: The course is intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor. Students are immersed in outcome-based scholarly activities with a faculty mentor. Working on either an individualized or small group basis, students develop, execute and report one or more projects addressing the interaction between research and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: IND

SPED 996A Research Other Than Thesis**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** IND**SPED 996B Readings in Special Education****Prerequisites:** Permission**Description:** Readings on selected problems in special education.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** IND**SPED 997J Advanced Practicum in Gifted Education****Crosslisted with:** EDPS 997J**Prerequisites:** Permission**Description:** Advanced practicum in the education of the gifted/talented child. Psychodiagnostic procedures; theory and research; and program organization, operation, and evaluation in a field setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**SPED 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Speech-Language Pathology and Audiology (SLPA)

SLPA 850 Audiology for Educators of the Deaf or Hard of Hearing**Crosslisted with:** SLPA 450**Description:** Anatomy and physiology of hearing; components of adequate evaluation for placement and educational planning; diagnosis using audiogram, functional and communication assessment; stimulation and utilization of residual hearing; and management of assistive and/or augmentative devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 851 Clinical Phonology: Assessment and Management****Prerequisites:** SLPA 250 and 464**Description:** Theoretical foundations; applied clinical phonology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** SLPA 981**SLPA 852 Normal Language Development During School Years****Crosslisted with:** SLPA 452**Description:** Normal syntactic, semantic, and pragmatic language development in school-age children and youth. Complex syntax, semantic development, pragmatic development, using language to learn, language-literacy relations, and abstract language development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 854 Research Methodology in Speech-Language Pathology and Audiology****Crosslisted with:** SLPA 454**Prerequisites:** Speech-language pathology and audiology major.**Description:** Introduction to research principles, methods, and design. Survey and critique of research in special education and communication disorders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SLPA 487**SLPA 861 Language Disorders: Preschool Level****Crosslisted with:** SLPA 461**Prerequisites:** Parallel SLPA 461L/861L.**Description:** Characteristics of language impaired preschool children and the nature of their disorders. Introduction to principles of assessment and treatment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 861L Language Disorders: Preschool Level Lab****Crosslisted with:** SLPA 461L**Prerequisites:** Parallel with SLPA 461/861.**Description:** Practical application of language assessment and intervention in preschool children with language disorders.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**SLPA 862A Language Disorders in Special Populations - Birth to Three: Communication Assessment & Intervention****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SLPA 862E Language Disorders in Special Populations - Preadolescents and Adolescents****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SLPA 862J Severe Disabilities and Autism: Communication Assessment and Intervention****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC

SLPA 862K Special Topics in Language Disorders**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SLPA 863 Language Disorders in Elementary School-aged Populations****Description:** Advanced information about language disorders, assessment, and intervention in elementary school-aged children.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 863L Language Disorders in Elementary School-aged Population Lab****Prerequisites:** Parallel enrollment in SLPA 863 required**Description:** Practical application of language assessment and intervention in elementary school-aged children with language disorders.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LAB**SLPA 865 Voice Disorders****Prerequisites:** SLPA 455**Description:** Etiology and symptoms of voice disorders, procedures used in clinical evaluation, and methods and procedures used in therapy.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** SLPA 981**SLPA 870 Evidence-based Practice****Description:** Identification and weighing of levels of evidence relating to clinical and research activities. Develop an understanding of evidence-based medicine and outcomes-based education.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SLPA 884 Speech and Language Development of the Hearing Impaired****Crosslisted with:** SPED 884**Description:** Theories of speech and language development as they apply to hearing impaired children. Evaluation and intervention of speech and language with emphasis on maintenance of communicative skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 885 Fluency Disorders****Description:** Research related to the nature, diagnosis and clinical management of stuttering is considered. Therapy models are presented along with data bearing on the efficacy of particular approaches. Specific rehabilitation procedures.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**SLPA 886 Augmentative Communication****Crosslisted with:** SLPA 486**Description:** Introduction to the augmentative communication options for persons unable to speak or write because of physical, language, or cognitive disability.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SLPA 984**SLPA 887 Language and Learning Disorders****Prerequisites:** For non-SLPA majors only**Description:** Review of prominent theories relating language to cognitive development and learning; student interaction on how varying styles and abnormal skills influence normal learning; how modifications can be made in materials content and classrooms to accommodate a child that has a language and learning disorder.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 888 Linguistic Needs of Bilingual and Culturally Different Students****Crosslisted with:** SLPA 488**Prerequisites:** SLPA 250 and 251.**Description:** Theoretical and applied information about situational factors which have an impact on spoken and written language; addresses how individual differences due to gender, handicapping conditions, socio-economic status, and cultural-ethnic background contribute to diversity in communication patterns and often act as a barrier to successful interactions in learning and social settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 891 Special Topics in Human Sciences****Crosslisted with:** HUMS 891, NUTR 891, TEAC 891, TMFD 891, CYAF 891**Description:** Aspects of human sciences not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SLPA 892 Counseling and Behavior Issues in Communication Disorders****Description:** Basic skills in counseling and behavior management as applied to the field of communication disorders. Practical, direct application to students' clinical work with individuals with a variety of communication disorders**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 3**Format:** LEC

SLPA 893 Clinical Decision Making

Description: Critical thinking skills necessary for decision-making during the assessment and treatment of individuals with communication disorders. Understanding and applying clinical processes related to the practice of speech-language pathology.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: FLD

SLPA 896 Readings and Research in Speech-Language Pathology and Audiology

Crosslisted with: SLPA 496

Prerequisites: Permission.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: IND

SLPA 897A Advanced Practicum: Audiology

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 20

Format: FLD

SLPA 897B Advanced Practicum: Speech Language Pathology

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

SLPA 897C Advanced Practicum: Speech-Language Pathology Year 2

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: FLD

SLPA 897E Advanced Practicum: Externship

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

SLPA 897G Advanced Practicum: Public Schools

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

SLPA 897T Advanced Practicum: Externship in Audiology

Description: Supervised practicum experiences provided with difficult speech, language and/or hearing problems in a variety of clinical, medical, geriatric, rehabilitational and public school settings.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: FLD

SLPA 898 Special Topics in Speech Pathology and Audiology

Prerequisites: Permission

Description: Special topics in speech pathology and audiology.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Format: LEC

SLPA 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

SLPA 902 Clinical Assessment

Description: Introduction to the basic psychological and physiological clinical measures for assessment of hearing in adults. The course includes instruction and practice in understanding, presentations and laboratory practice are used to facilitate the classroom to clinic transition.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 904 Basic Instrumentation

Description: An introductory course for graduate and clinical students in life and health sciences which includes lectures and exercises in electronics, electrophysiology, instrumentation, and signal processing. The focus is on the theory and practice of using laboratory and clinical instrumentation in the collection and analysis of signals. Signals commonly used in speech and hearing sciences will serve to illustrate general principles. Topics include basic electronics, cabling, grounding and connecting instruments, signal generation and monitoring, sensors, amplifiers, filters, electronic computation and calibration, analog and digital signal processing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 906 Evidence-Based Practice in Audiology

Description: Issues of professionalism and the development of best-practice models in Audiology. Relationship-centered patient care and the impact of multicultural issues on the practice of Audiology. Use of clinical decision analysis and evidence-based practice. Application to the common clinical assessment tools discussed in the Clinical Assessment course.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 908 Auditory Physiology and Pharmacology

Description: Lectures exploring the fundamental nature of the auditory system from the level of the outer ear to the cerebral cortex. Emphasis will be placed on studying the genetic, anatomical, neurochemical, pharmacological, and physiological bases for both normal and pathological auditory function.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

SLPA 910 Auditory Signal Processing

Description: Principles of signal processing relevant to tests of hearing and to theories of functioning of the auditory system. Introduction of concepts in mathematics, vibration and acoustics. Time- and frequency-domain representations of signals, digital filtering, analysis of lumped-element circuits, linear and nonlinear signal analyses, modulation theory, and the effect of noise on measurements. Applications relevant to audiology including hearing aid performance and measurements, middle-ear transmission, cochlear mechanics, and auditory-nerve firing patterns. Application of these models to understanding physiological sources of conductive and sensorineural hearing loss.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 912 Perception of Sound

Description: Psychoacoustic aspects of audition, including instrumentation, masking level differences, scaling, difference limen, loudness, critical bands and critical ratios, absolute threshold measurement, differential threshold measurement, temporal summation, and speech recognition.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: SPRING

SLPA 916 Disorders of the Auditory System

Description: An overview of disorders of the peripheral and central auditory systems along with an in-depth discussion of neurophysiological model, assessment and treatment of tinnitus. Considerations in the screening, assessment and management of Auditory Processing Disorders are included. In addition, there is a review of cranial nerves and temporal bone anatomy. Students are required to complete presentations on selected disorders of the auditory system.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 918 Auditory Assessment of Infants and Children

Prerequisites: SLPA 271 or equivalent

Description: Development of the auditory system in infants and young children. Techniques used in differential diagnosis, and screening of auditory disorders in the pediatric population.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 920 Auditory Electrophysiological Assessment

Description: This course focuses on current auditory electrophysiological assessment procedures, and includes theory, instrumentation, techniques and procedures. Test result interpretation is discussed in relation to underlying anatomy and physiology. Laboratory exercises are included.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 924 Amplification I

Prerequisites: SLPA 271 or equivalent

Description: Design and operation of basic digital amplification systems. Discussion of advanced signal processing strategies used in current hearing aids. Instruction and laboratory practice in the electroacoustic analysis and real-ear probe microphone measurements of hearing aid systems and making earmold impressions. Introduction to earmold/plumbing acoustics.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

SLPA 926 Amplification II

Prerequisites: SLPA 271 or equivalent

Description: Evaluation, candidacy and selection of hearing aids for adults and children. Discussion of current and emerging prescriptive and fitting verification methods. Instruction and laboratory experience in verification of hearing aid fittings using real-ear probe microphone measurements along with administration of validation measures. The course will also address special hearing aid fittings and troubleshooting hearing aid problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 928 Hearing Conservation and Industrial Audiology

Description: Theories and basic resources for participation in industrial, government, or community hearing conservation programs.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 930 Genetic Basis of Communication and Learning

Description: Study of embryology and genetics related to communication and learning. Embryology of human development is discussed with specific emphasis on development of the brain, craniofacial, and inner ear structures. The genetic basis of normal development is examined, as well as disorders of hearing, balance, communication, and learning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 932 Vestibular Assessment I

Description: The first of a two-course series on the normal and pathophysiology of the human balance system and tools for its investigation and treatment. Normal anatomy and physiology of the balance and ocular motor systems, contrasted with a wide range of pathological conditions. Electro-nystagmography (video-nystagmography two- and three-dimensional recordings) and assessment of the otolith organs. Students will initiate and carry out directed laboratory assignments.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

SLPA 934 Vestibular Assessment II

Description: The second of a two-course series on the normal and pathophysiology of the human balance system and tools for its investigation and treatment. Advanced techniques for patient assessment using rotational chair and posturography protocols. Techniques for full assessment in an office situation without extensive equipment. Options for treatment and management of this group of patients. Vestibular and balance rehabilitation therapy program development.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 936 Implantable Prosthetics

Description: Design, operation, candidacy, assessment, surgical procedures, fitting, verification, and rehabilitation procedures related to implantable prosthetic devices for individuals who are deaf and hard of hearing. Cochlear implants, bone anchored hearing aids, implantable middle ear devices, and auditory brainstem implants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 938 Business and Financial Management

Description: An overview of principles and procedures as they relate to an audiology practice. Topics discussed include budgeting, pricing, billing, and coding, regulatory issues, and human resource management. Students are required to design an audiology practice and develop a business plan as part of this course.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 940 Aural Rehabilitation Across the Lifespan

Description: This course provides students with a survey of approaches to aural rehabilitation for adults and children with hearing loss in various rehabilitative and habilitative settings. Principles of early intervention and family-centered practices are presented for infants and toddlers with hearing loss. Information and techniques for the development of auditory perception and spoken language skills for children with hearing loss. For adults information regarding psychosocial, emotional, and vocational consequences of hearing loss is presented. Speech perception training and communication effectiveness approaches for adults with hearing loss are viewed. Principles of auditory + visual communication are discussed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 942 Seminar in Audiology

Description: Research and clinical procedures; findings and implications in audiology and hearing science.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 956 Language Study of Teachers of Deaf and Hard of Hearing (DHH)

Crosslisted with: SPED 956

Prerequisites: Admission to Graduate Degree or Certificate program in Special Education or Speech-Language Pathology or by permission of instructor.

Description: Theoretical and practical aspects of American Sign Language (ASL) structure. Issues relevant to the use of sign language in education, written English as a second language, classroom discourse, and educational interpreting. Socio-lingual aspects of sign language among deaf and hearing individuals.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Offered: SUMMER

SLPA 964 Speech Perception and Processing

Prerequisites: SLPA 250 and 456

Description: Human and computer perception and processing of speech. The speech code and its representation in the brain, laboratory techniques for perceptual experimentation, acoustic analysis of speech, and computer synthesis of speech.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 966 Swallowing Disorders

Prerequisites: Parallel registration with SLPA 966L

Description: Swallowing disorders of children and adults. Procedures used in assessment, diagnosis, and intervention.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 966L Swallowing Disorders

Prerequisites: Parallel registration with SLPA 966

Description: Practical application of assessment, diagnosis, and treatment of swallowing disorders in children and adults.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LAB

SLPA 967 Cleft Palate

Prerequisites: SLPA 464 or equivalent

Description: Communication, dental, medical, and associated problems related to cleft palate.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: SLPA 981

SLPA 968 Motor Speech Disorders

Prerequisites: SLPA 853

Description: Motor speech disorders resulting from neuropathology of the central and peripheral nervous systems as found in cerebral palsy, Parkinsonism, and other developmental and acquired neuromotor problems of children and adults.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: SLPA 981

SLPA 980B Seminar in Speech Acoustics

Prerequisites: SLPA 455 and 456 or equivalent

Description: Research procedures, findings, and implications in speech and hearing science (experimental phonetics) in the areas of physiology, acoustics, and psychoacoustics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 981 Seminar in Speech Pathology

Prerequisites: SLPA 851, 865, 967, and/or 968

Description: Research procedures, findings and clinical implications.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

SLPA 981D Voice Disorders

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 981E Motor Speech Disorder

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 983A Child Language Development and Disorders

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 983B Adolescent/Adult Language Development and Disorders

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 983E Augmentative/Alternative Communication

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 984 Seminar in Augmentative Communication

Prerequisites: SLPA 886

Description: Advanced seminar on research literature in the augmentative communication field.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SLPA 985 Traumatic Brain Injury

Prerequisites: SLPA 853

Description: Assessment and treatment of child and adult cognitive and communication disorders resulting from traumatic brain injury.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 986 Right Hemisphere Dysfunction

Description: Communication disorders resulting from stroke or other acquired nervous insult to the non-language dominant hemisphere of the brain. Cognitive and communication assessment, intervention issues pertaining to problems with orientation, visual perception, visual motor skills, abstract language and reasoning, and pragmatic behaviors.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 987 Aphasia in Adults

Prerequisites: SLPA 853

Description: Adult language disorders resulting from stroke or other acquired central nervous system insult. Includes historical/theoretical development of understanding, cerebral dominance for language, classifications, rationale for diagnostic and therapeutic management, prognostic factors, agnosias and apraxia.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SLPA 988 Dementia

Description: Etiology, characteristics, assessment, and intervention pertaining to cognitive and communication disorders associated with various types and stages of dementia.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

SLPA 994 Doctoral Capstone

Description: Selection of the topic for this project should take place no later than Fall of the second year by consultation with the project advisor. Enrollment in SLPA 994 is required during each semester that the project is underway. Students must receive prior permission from their advisor before registering for capstone hours. The capstone experience represents a major research project containing a significant treatment of some aspect of audiology.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: IND

SLPA 995 Doctoral Seminar

Prerequisites: Permission

Description: The course is intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor. Students are immersed in outcome-based scholarly activities with a faculty mentor. Working on either an individualized or small group basis, students develop, execute and report one or more projects addressing the interaction between research and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: IND

SLPA 996 Research Problems Other Than Thesis

Prerequisites: Permission

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 9

Format: IND

SLPA 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Statistics (STAT)

STAT 801A Statistical Methods in Research: Non Calculus

Prerequisites: Introductory course in statistics.

Notes: This is an introductory, non-calculus based course for students who will not take statistics courses beyond STAT 802, 803 or 804. Students interested in taking more advanced statistics courses should register for STAT 801B.

Description: Statistical concepts and statistical methodology useful in descriptive, experimental, and analytical study of biological and other natural phenomena. Practical application of statistics rather than on statistical theory.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: AGRO 816E; AGRO 907, HORT 907, METR 907, NRES 907; AGRO 931, ASCI 931, HORT 931; CIVE 963; CIVE 964; NRES 803, STAT 803; STAT 802; STAT 841; STAT 850; STAT 870; STAT 873; STAT 874; STAT 876

STAT 801B Statistical Methods in Research: Calculus

Prerequisites: Introductory statistics course; at least one semester of calculus.

Notes: This course (not STAT 801A) is a pre-requisite for Stat 870, 873, 875 and 876. Can also be used as a pre-requisite for Stat 802 and 803. Students planning on taking statistics courses beyond STAT 802, 803 and 804 should register for this course, not STAT 801A.

Description: Statistical concepts and methodology useful for description, analysis and interpretation of experimental and observational studies. Practical application of statistics and essential background for subsequent courses in statistics.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

STAT 802 Design and Analysis of Research Studies

Prerequisites: STAT 318 or STAT 801A.

Description: Essential statistical characteristics of a research study intended to assess the impact of treatment, environmental or population conditions on response. Focus is on both designed experiments and on studies for which controlled experiments are not feasible but characteristics of controlled experiment must be mimicked to the extent possible. Methods to assess power and compare efficiency of alternative designs are considered. Course covers major design structures, including blocking, nesting, multilevel models, split-plot and repeated measures, and statistical analysis associated with these structures.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Prerequisite for: AGRO 816E; ASCI 944, STAT 844; STAT 831; STAT 870; STAT 877; STAT 902; STAT 971

STAT 803 Ecological Statistics**Crosslisted with:** NRES 803**Prerequisites:** STAT 801 or equivalent; prior experience with "R" software**Notes:** Available online.**Description:** Model-based inference for ecological data, generalized linear and additive models, mixed models, survival analysis, multi-model inference and information theoretic model selection, and study design.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**STAT 804 Survey Sampling****Prerequisites:** STAT 880 or IMSE 321**Description:** Sampling techniques: simple random sampling, sampling proportions, estimation of sample size, stratified random sampling, ratio and regression estimates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 810 Alpha Seminar****Prerequisites:** Statistics graduate student**Description:** Program requirements, resources available, tips for academic success, professional statistical organizations, career paths, history of statistics, ethics, statistical conferences, statistical blogs and online forums, frequentist and Bayesian paradigms, current research in department.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**STAT 811T Statistics for Middle-Level Teachers****Prerequisites:** A valid teaching certificate or permission. An undergraduate course in introductory statistics is desirable, but not essential.**Notes:** Not open to MA or MS students in mathematics or statistics.**Description:** Designed primarily to develop and equip middle-level teachers with the statistical knowledge they need for teaching. The course follows an inquiry/discovery design, dedicating much of class time to activities, discussion and group work. The course emphasizes topics in statistics that are part of the middle-school mathematics curriculum, as well as their application in other disciplines. The course also includes statistics that are used in education and school-based research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 812T Statistics for High School Teachers****Prerequisites:** A valid secondary mathematics teaching certificate.**Notes:** Not open to MA or MS students in mathematics or statistics.**Description:** The statistical concepts typically taught in a high school statistics class, including linear regression, two-way tables, sampling distributions, statistical inference for means and proportions, chi-square tests, and inference for regression. Some experience with basic statistical concepts (mean, standard deviation, elementary probability) is necessary. The course is inquiry-based, and will emphasize applications and statistical thinking.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 821 Statistical Methods I****Prerequisites:** Matrix Algebra; concurrently taking STAT 882, or passed STAT 882 with grade of B or higher, or passed STAT 880 with grade of B or higher.**Notes:** Designed for Statistics MS majors and minors.**Description:** Introduction to essential statistical methods and supporting design and modeling theory for professional statistical practice. First in a three semester sequence. Focus of this course on methods for single response variable and non-hierarchical study design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Prerequisite for:** ASCI 944, STAT 844; STAT 822**STAT 822 Statistical Methods II****Prerequisites:** STAT 821; concurrently taking STAT 883, or passed STAT 883 with grade of B or higher, or passed STAT 880 with grade of B or higher.**Notes:** Course is designed for Statistics MS majors and minors.**Description:** A continuation of Statistical Methods I. Second in a three semester sequence on essential statistical methods and supporting design and modeling theory for professional statistical practice. Focus in this course of methods for single response variable and multiple sources of random variation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** STAT 823; STAT 825

STAT 823 Statistical Methods III

Prerequisites: STAT 822; STAT 883 with grade of B or higher, or STAT 880 with grade of B or higher.

Notes: This course is designed for Statistics MS Majors.

Description: Introduction to essential statistical methods and supporting design and modeling theory for professional statistical practice. Third in a three semester sequence. Focus of this course on methods for situations that extend beyond the single-response-variable, designed study cases featured in Statistical Methods I and II. These include multivariate statistics, non-linear models, non- and semi-parametric statistics, observational studies, and other theory and methods deemed appropriate as statistical science continues to evolve.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: STAT 950; STAT 983

STAT 825 Principles of Statistical Consulting and Interdisciplinary Collaboration

Prerequisites: STAT 822 or instructor permission.

Description: Introduction to the role and purpose of statistical consulting and interdisciplinary collaboration. Topics include: asking good questions, dealing with difficult clients, communicating statistics to non-statisticians, determining solutions, and collaborating.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 830 Sensory Evaluation

Crosslisted with: FDST 430, FDST 830, STAT 430

Prerequisites: Introductory course in statistics.

Description: Food evaluation using sensory techniques and statistical analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 831 Spatial Statistics

Prerequisites: STAT 802

Notes: Offered odd-numbered calendar years.

Description: Statistical methods for modeling and analyzing correlated data, with emphasis on spatial correlation. Descriptive statistics, time series, correlograms, semivariograms, kriging and designing experiments in the presence of spatial correlation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 832 Statistics in Sports

Description: Statistical methods useful for analyzing sports-related data. Descriptive statistics, graphical representations, experimental design, discriminant analysis and optimization.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

STAT 841 Statistical Methods for High Throughput Biological Data

Prerequisites: STAT 801A or equivalent.

Description: Basic biological concepts. Multiple testing and false discovery rate. Second generation sequencing and statistical issues. ChIP-seq. RNA-seq. Empirical Bayes methods and software. Normalization, experimental design and commonly used models for microarray data. Metabolomics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 842 Computational Biology

Crosslisted with: BIOC 842, STAT 442, BIOC 442

Prerequisites: Any introductory course in biology, or genetics, or statistics.

Description: Databases, high-throughput biology, literature mining, gene expression, next-generation sequencing, proteomics, metabolomics, system biology and biological networks.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 843 Next-Generation Sequencing and Systems Biology

Prerequisites: Any introductory course in biology, statistics, computer science or mathematics

Description: Next-generation RNA and genome sequencing, systems biology. Regulatory networks of transcription, protein-protein interaction networks, theory and practice. Databases, data integration and visualization. Students present computational biology publications and projects.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 844 Quantitative Methods for Genomics of Complex Traits

Crosslisted with: ASCI 944

Prerequisites: ASCI 861U or AGRO/ASCI/HORT 931 or BIOS 818 or equivalent; STAT 802 or 821 or equivalent.

Description: Quantitative genetic analysis of complex traits. Quantitative methodologies for connecting phenotypes with high-dimensional genomic information to understand polygenic traits from both prediction and inference perspectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

STAT 847 Biometrical Genetics and Plant Breeding

Crosslisted with: AGRO 932

Prerequisites: AGRO 931

Notes: STAT 802 recommended. Offered odd-numbered calendar years.

Description: Theoretical concepts involved in planning breeding programs for the improvement of measurable morphological, physiological, and biochemical traits that are under polygenic control in crop plants of various types.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 850 Computing Tools for Statisticians

Prerequisites: STAT 801A or equivalent; STAT 462, 880, or equivalent is recommended.

Description: Introductions to statistical computing packages and document preparation software. Topics include: graphical techniques, data management, Monte Carlo simulation, dynamic document preparation, presentation software.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

STAT 862W Applied Variance Component Estimation in Livestock Genetics

Crosslisted with: ASCI 862W

Prerequisites: ASCI 862V

Notes: This is a 5-week course taught by Speidel and Enns (Colorado State University). Permission required before registering. Contact the Animal Science Department at 402-472-6440.

Description: Principles in the estimation of (co)variance components and genetic parameters required to solve mixed models typical in livestock genetics. Focus on applied knowledge of approaches used to estimate the G and R sub-matrices of the mixed model equations. Demonstrate models commonly used in parameter estimation. Introduce scientific literature concerning implementation, and attributes of the solutions, of variance component estimation strategies.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

STAT 868 An Introduction to R Programming

Crosslisted with: ASCI 868

Prerequisites: Graduate Standing

Notes: This is a 5-week course taught by Maltecca (North Carolina State University).

Description: Introduction to the R environment for statistical computing, including use of R as a high-level programming language and as a gateway for more formal low-level languages. Material includes language structure, basic and advanced data manipulation, statistical analysis with R, and using R as a programming language.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Prerequisite for: ASCI 869, STAT 869

STAT 869 MCMC Methods in Animal Breeding: A Primer

Crosslisted with: ASCI 869

Prerequisites: ASCI 868.

Notes: This is a 5-week course taught by Maltecca (North Carolina State University).

Description: Principles of Markov Chain Monte Carlo (MCMC) methods in animal breeding. Materials include random variable generation, Monte Carlo integration, stochastic search, Expectation-maximization (EM) algorithm and Monte Carlo EM, Markov Chain principles, Metropolis-Hastings algorithm, Gibbs sample, and MCMC for genomic data. Illustrations developed using R software.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

STAT 870 Multiple Regression Analysis

Prerequisites: STAT 801A, STAT 802

Description: Linear regression and related analysis of variance and covariance methods for models with two or more independent variables. Techniques for selecting and fitting models, interpreting parameter estimates, and checking for consistency with underlying assumptions. Partial and multiple correlation, dummy variables, covariance models, stepwise procedures, response surfaces estimation, and evaluation of residuals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: STAT 974

STAT 873 Applied Multivariate Statistical Analysis

Prerequisites: STAT 801A

Description: Multivariate techniques used in research. Reduction of dimensionality and multivariate dependencies, principle components, factor analysis, canonical correlation, classification procedures, discriminant analysis, cluster analysis, multidimensional scaling, multivariate extensions to the analysis of variance, and the general linear model.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: STAT 973

STAT 874 Nonparametric Statistics

Prerequisites: STAT 801A or STAT 880

Description: Statistical methods useful when data does not adhere to classical distributional assumptions. Analysis of interval/ordinal/categorical data for one, two and k sample problems, correlation and regression, goodness-of-fit methods and related topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 875 Categorical Data Analysis

Prerequisites: STAT 801A, STAT 802 or STAT 870 recommended

Description: Measures of associating contingency tables analysis, chi-squared tests, log-linear and logistic models, generalized estimating equations, planning studies involving categorical data.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 876 Introduction to Survival Analysis**Prerequisites:** STAT 801A.**Notes:** Offered every other odd-numbered calendar year. Knowledge of at least one statistical package (SAS, R, Splus, SPS) is required.**Description:** Application, theory and computational aspects of survival analysis. Survival and hazard functions; parametric models for survival data; censoring and truncation mechanisms; nonparametric estimation (confidence bands for the survival function, interval estimation of the mean and median survival time); univariate estimation of the hazard function; hypothesis testing; regression models (with fixed covariates, with time dependent covariates); and model diagnostics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 877 Introduction to Mixed Model Analysis****Prerequisites:** STAT 802**Description:** Practical application of mixed models for data analysis, estimation, prediction, and testing. This course covers linear mixed models (LMM) for normally distributed data and generalized linear mixed models (GLMMs) for non-normally distributed data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** SPRING**STAT 880 Introduction to Mathematical Statistics****Prerequisites:** MATH 208 or 107H; STAT 218 or equivalent**Notes:** STAT 880 is not open to students earning a MA or MS degree in mathematics or statistics. This course requires command of material covered in MATH 107 or 107H, and STAT 218. It is also recommended to have command of materials covered in MATH 208 or 208H.**Description:** Introductory mathematical statistics. Probability calculus; random variables, their probability distributions and expected values; sampling distributions; point estimation, confidence intervals and hypothesis testing theory and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** CSCE 970; CSCE 973; CSCE 977; ECON 917; ENGR 806; STAT 804; STAT 821; STAT 822; STAT 823; STAT 874; STAT 884**STAT 882 Mathematical Statistics I-Distribution Theory****Prerequisites:** MATH 208 or MATH 107H.**Description:** Sample space, random variable, expectation, conditional probability and independence, moment generating functions, special distributions, sampling distributions, order statistics, limiting distributions and central limit theorem.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ECON 917; STAT 821; STAT 883; STAT 971**STAT 883 Mathematical Statistics II-Statistical Inference****Prerequisites:** STAT 882**Description:** Interval estimation; point estimation, sufficiency and completeness; Bayesian procedures; uniformly most powerful tests, likelihood ratio test, goodness of fit tests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** STAT 822; STAT 823; STAT 950; STAT 971; STAT 980; STAT 982; STAT 983**STAT 884 Applied Stochastic Models****Prerequisites:** STAT 880 or IMSE 321 or equivalent**Description:** Introduction to stochastic modeling in operations research. Includes the exponential distribution and the Poisson process, discrete-time and continuous-time Markov chains, renewal processes, queueing models, stochastic inventory models, stochastic models in reliability theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 889 Statistics Seminar****Prerequisites:** Permission**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**STAT 892 Topics in Statistics and Probability****Prerequisites:** Permission**Description:** Special topics in either statistics or the theory of probability.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 24**Format:** LEC**STAT 898 Statistics Project****Prerequisites:** Permission**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**STAT 899 Masters Thesis****Prerequisites:** Admission to the Masters Degree Program and permission of major adviser**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 99**Format:** IND

STAT 902 Advanced Experimental Design

Prerequisites: STAT 802

Description: Advanced design concepts and methods used in research: construction, analysis and interpretation of incomplete block designs, split-plots, confounded and fractional factorials, response surface methods, and other topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 904 Theory of Experimental Design

Prerequisites: Permission

Description: Theory of underlying construction and analysis of designed experiments. Multifactor designs, fractional factorials, incomplete block designs, row and column designs, orthogonal arrays, and response to surface designs. Optimality criteria. Mathematical and computer-aided design theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 930 Advanced Statistical Consulting and Interdisciplinary Collaboration

Prerequisites: Permission

Notes: For advanced Masters degree students or PhD students in Statistics.

Description: Exposure to more complex statistical consulting problems and how to resolve them. Topics include: major areas of consulting, interdisciplinary collaboration, and effective communication.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: STAT 997

STAT 950 Computational Statistics I

Prerequisites: STAT 883; STAT 823 or concurrent enrollment.

Notes: Prior experience with "R" software is required.

Description: Statistical computing needed for research and advanced statistical analyses. Topics include: bootstrap, high performance computing, jackknife, Linux, Markov chain Monte Carlo, Monte Carlo simulation, numerical differentiation and integration, optimization, parallel processing, permutation tests.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: STAT 951

STAT 951 Computational Statistics II

Prerequisites: STAT 950

Notes: Knowledge of a high-level programming language is recommended

Description: A continuation of Computational Statistics I. Topics will be chosen from big data management and data analysis, data generation, high performance and throughput computing, importance sampling, machine learning, optimization, programming languages, web scraping, working with databases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 970 Linear Models

Prerequisites: MATH 314/814.

Description: Methods and underlying theory for analyzing data based on linear statistical models. General linear model with specific models as special cases: including linear models applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: STAT 971; STAT 972; STAT 973

STAT 971 Advanced Statistical Modeling

Prerequisites: STAT 802, STAT 882, STAT 883, STAT 970 and take Statistics MS Comprehensive Exam prior to start of STAT 971

Description: Statistical modeling beyond the "general linear model" normally-distributed data, fixed-effects-only case. Focus on, but not limited to, the theory and practice of generalized and mixed linear models. Issues include translation of study design to plausible models, inference space, data and model scale, conditional vs. marginal models, correlated data, zero-inflated data, likelihood-based estimation and inference.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 972 Variance Component Estimation

Prerequisites: STAT 970

Description: Design and analysis of random effects and mixed models. Basic theoretical background for models with fixed effects, distribution of quadratic forms, quadratic estimators including ANOVA methods, likelihood estimators including ML and REML, computing strategies, and optimal design for nested and cross classifications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 973 Theory of Multivariate Analysis

Prerequisites: STAT 873 and STAT 970, or equivalent

Description: Statistical inference concerning parameters of multivariate normal distributions with applications to multiple decision problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 974 Nonlinear Regression Analysis

Prerequisites: STAT 870 and introductory calculus.

Description: Basic concepts of nonlinear models and their associated applications. Estimating the parameters of these models under the classical assumptions as well as under relaxed assumptions. Major theoretical results and implementation using standard statistical software.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

STAT 980 Advanced Probability Theory I**Prerequisites:** STAT 883**Notes:** This course requires command of material covered in MATH 325 or equivalent.**Description:** Construction of probability spaces, random variables and expectations, monotone and dominated convergence theorems, Fatou's lemma, modes of convergence, Kolmogorov law of large numbers, central limit theory, conditional probability given a sigma field.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** STAT 981; STAT 984**STAT 981 Advanced Probability Theory II****Prerequisites:** STAT 980**Description:** A continuation of STAT 980 providing depth in probability theory and stochastic processes. Topics include convergence properties of random variables and treatment of several important stochastic processes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 982 Advanced Inference****Prerequisites:** STAT 883**Description:** Uniformly minimum variance unbiased estimators, decision-theoretic Bayes estimation, frequentist testing (likelihood ratio tests, Neyman-Pearson lemma, uniformly most powerful tests), Bayes testing and Bayes factors, nonparametric tests, multiple comparisons procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 983 Statistical Learning****Prerequisites:** STAT 823, STAT 883**Description:** Model selection including sparsity methods and their oracle properties, information methods, cross-validation and stochastic search. Basic theory of kernel methods for regression. Classification: linear and quadratic discriminants, Bayes classifier, nearest neighbor methods, kernel methods for classification. Introduction to neural networks and recursive partitioning. Model averaging methods and measures of complexity. Cluster analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 984 Asymptotics and Applications****Prerequisites:** STAT 980**Description:** A continuation of STAT 980 providing breadth in commonly occurring major subfields of statistics that rely heavily on probability theory. Large sample theory estimation, testing, expansion, and convergence in a variety of settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**STAT 992 Advanced Topics in Probability and Statistics****Prerequisites:** Permission**Description:** Special topics in either statistics or probability.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 24**Format:** LEC**STAT 997 Practicum in Statistical Consulting****Prerequisites:** STAT 930**Description:** Participation in statistical consulting activities of the Statistics Department under faculty supervision. Prepare written reports to clients summarizing consultation results and to statistics supervisor summarizing statistical issues and findings.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** FLD**STAT 999 Doctoral Dissertation****Prerequisites:** Admission to Doctoral Degree Program and permission of supervisory committee**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Supply Chain Management and Analytics (SCMA)

SCMA 831 Advanced Enterprise Systems**Description:** Analytical approach to the design, planning, and control of operations management systems, including domestic and international, manufacturing and service operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 832 Planning and Controlling Supply Chain Systems****Prerequisites:** GRBA 815 (Supply Chain Management Strategies)**Description:** Taught predominately by the case method with a few classes for review and summary lectures. Concentrates on higher management decisions involving the manufacturing, service, and public sectors. Facilities planning, labor, aggregate planning, strategic planning, capacity management, and trade-off analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 833 Advanced Topics in Supply Chain Management****Prerequisites:** GRBA 815**Description:** Advanced conceptual and methodological practices in designing and planning supply chain systems. Advances and strategies in supply chain procurement, transportation, distribution and warehousing, globalization, outsourcing, and technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SCMA 834 Advanced Topics in Lean Supply Chain Management**Prerequisites:** GRBA 815**Description:** Focus on the improvement of supply chain operations through the application of lean management principles. Topics include just-in-time, six-sigma, theory of constraints, and associated tools and applications. The course would be offered primarily in the on-line MBA program.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 836 Project Management and Implementation****Prerequisites:** Admission to MBA or Supply Chain Certificate Program**Description:** Planning and managing projects from initiation through implementation. Use of tools and techniques for bidding, planning budgeting scheduling, risk management and implementation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 837 Risk and Simulation Modeling****Description:** Analytical and simulation models for decision making in functional areas such as finance, accounting, marketing, personnel, operations, and inventory. Construction of decision models for practical applications. Emphasis on analyzing alternatives and implementing solutions that result in increased productivity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 839 Global Supply Chain Management****Prerequisites:** GRBA 815**Description:** Focus on global aspects of supply chain managing with primary emphasis on sourcing and distribution strategies. Topics will include sourcing strategies, concepts and tools. Specific issues include make versus buy decisions, supplier evaluation and selection, total cost of ownership, contracts and legal terms, negotiation, and purchasing ethics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 844 Managing Logistics in the Supply Chain****Prerequisites:** GRBA 815**Description:** Examination of physical distribution activities in the marketing mix from the viewpoints of both providers and users of components of logistics systems. Logistics problems of concern to the marketing manager include time and place utility concepts, spatial relationships of markets, channel design, transportation modes, and inventory management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 847 Advanced Supply Chain Technology****Prerequisites:** GRBA 815**Description:** Technological advancements to include radio frequency identification systems, automated storage and retrieval systems, distribution routing systems. Description of physical characteristics, potential to support supply chain management, and implications on inventory management within supply chains.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 851 Predictive Analytics****Prerequisites:** GRBA 851**Description:** This course will focus on how knowledge management has been successfully applied in business in the form of predictive analytics. Predictive analytics extends statistical and/or artificial intelligence to provide forecasting capability. It will also describe in non-technical terms the statistical and artificial intelligence-based tools commonly used in forecasting and other business decisions involving big data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 852 Data Management and Organization****Prerequisites:** GRBA 851**Description:** Technology of databases and related human and managerial considerations. Databases are studied from the perspective of the logical organization, as well as from the perspective of managers and applications programmers, in the use of organizational data. Consideration of physical organization and SQL. Practical applications of databases.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 853 Business Data Mining and Descriptive Analytics****Prerequisites:** GRBA 851**Notes:** The Supply Chain Management Analytics department is changing the name to be more reflective of the content.**Description:** Data mining applies quantitative analysis to support humans in identifying actionable information from large amounts of data. Actionable means that value can be obtained, which for businesses usually relates to making money. This course will focus on how data mining has been successfully applied in business. It will also describe in non-technical terms how the statistical and artificial intelligence-based tools commonly used in data mining work. The course will also address ethical issues related to use of information obtained through data mining.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 854 Advanced Descriptive Analytics****Prerequisites:** GRBA 851**Description:** This course will focus on exploratory and initial data mining, including cluster analysis and link analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SCMA 855 Prescriptive Analytics**Prerequisites:** GRBA 851**Description:** This course will focus on how optimization modeling techniques can be used to make the best decisions in a variety of business analytics applications. The emphasis will be on the formulation of different optimization problems and the use of the correct quantitative techniques to solve these problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SCMA 996 Directed Reading or Research****Prerequisites:** Permission of Department Chair**Description:** Specific topic covered in any given term and credit awarded is to be determined by the instructor.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND

Survey Research and Methodology (SRAM)

SRAM 800 Research Methods**Crosslisted with:** POLS 800**Description:** Basic techniques used in quantitative political science research. The general linear model. Basic probability theory, ordinary least squares regression, and how to solve problems often encountered when conducting quantitative analyses in political science.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 816 Principles of Survey Analysis****Description:** Introduction to the basic principles of causality and inductive logic in contemporary social and behavioral science. One, two, and multi-way layouts in analysis of variance, fixed effects models, and linear regression in several variables; the Gauss-Markov-Theorem; multiple regression analysis; and basic principles of experimental and quasi-experimental designs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** SRAM 917**SRAM 817 Cross-cultural and Multi-population Survey Methodology****Description:** Multi-national research projects and the methodological challenges. Key aspects of cross-national, cross-cultural survey research, study design and organization; survey error and bias; question design; harmonization; adaptation and translation; survey process quality monitoring and control; and process and output documentation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 818 Data Collection Methods****Crosslisted with:** SOCI 818**Description:** Effects of various data collection methods on survey errors. The strengths, weaknesses, and challenges of data collection modes and mixed-mode methods. Processes underlying data collection and practical challenges that arise with each mode; coverage error; nonresponse error; interviewer effects and training; timing; and mode effects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 819 Applied Sampling****Crosslisted with:** SOCI 819**Description:** Design of probability samples, sampling populations of humans and unique challenges posed by such populations, restricted by cost and available sampling frames. Simple random sampling, stratification, cluster sampling, systematic sampling, multistage sampling, and probability proportional to size sampling, area probability sampling, and telephone samples.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 824 Advanced Quantitative Analysis in Marketing****Crosslisted with:** MRKT 824**Prerequisites:** GRBA 813 or equivalent**Description:** Review, evaluation, and design of advanced marketing research investigations. State-of-the-art methodological issues relevant to marketing to provide an understanding of multivariate data analysis pertinent to the marketing literature. Analysis of linkage, structure, and causality/change for marketing phenomena.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 863 Basic Regression Analysis****Crosslisted with:** SOCI 862**Description:** The logic and techniques of sociological data analysis: use statistical software to run linear regression analyses and assess violations of regression assumption; the development of theoretically driven models; and the interpretation of results from linear regression analyses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 865 Survey Design and Analysis****Crosslisted with:** SOCI 465, SOCI 865, SRAM 465**Prerequisites:** SOCI 205 and SOCI 206.**Description:** Basic issues related to the design and analysis of sample surveys. The basics of questionnaire construction, sampling, data collection, analysis and data presentation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

SRAM 894 Professional Development in Survey Research

Description: Basic principles of practice including ethical requirements and procedures, Institutional Review Board (IRB) and Collaborative Institutional Training Objective (CITI), personal conduct, plagiarism. Introduction to relevant databases, data archives, key surveys. Practice in critical discussion, report and abstract writing, creating and presenting conference papers. Provides first year MS students with a grounding in key principles and components of professional practice needed for a career in survey research and related fields.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

SRAM 895 Internship

Prerequisites: Permission

Description: Experience applying concepts and methods of survey research in preparation for a professional career.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: FLD

SRAM 896 Practicum in Survey Research and Methodology

Prerequisites: Permission

Description: Application of theory and research gained during internship.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: IND

SRAM 898 Special Topics

Description: Topic varies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 24

Format: LEC

SRAM 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

SRAM 902 Seminar in Research Methods

Crosslisted with: SOCI 902

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

SRAM 915 Advanced Sampling

Description: Advanced topics related to sampling error in surveys.

Complex sample designs used to measure populations of humans, effect of nonresponse on sampling error and data analysis; methods available to "repair" the missing information; the implications of complex sample designs for analyses; and variance estimation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SRAM 917 Principles of Survey Analysis II

Prerequisites: SRAM 816

Description: Key components of analytic models used in analysis of survey data. Analysis of variance (anova), linear regression (ols) and generalized linear model (glm) to include estimation of coefficients for a specified set of "structural equations" designated by a hypothesized causal structure (i.e., SEMs). Main statistical models for estimating nonlinear regression coefficients. Introduction to principles of maximum likelihood estimation (mle) and alternative estimation approaches. Focus on development of the ability to conduct independent quantitative research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SRAM 920 Instrument Design and Development for Cross-cultural Surveys

Description: Design instruments for multi-population surveys and to produce versions in different languages. Major approaches and strategies used in cross-national and cross-cultural research to design, test, adapt, and translate instruments for multilingual use.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SRAM 921 Total Survey Error

Crosslisted with: SOCI 921

Description: Common language of survey errors across social science disciplines. Causes of survey coverage, nonresponse, measurement, and processing errors; techniques used to reduce the error in practice; and statistical models and designs that exist to measure the error. Implications of cost and trade-offs between error sources.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SRAM 922 Randomized and Nonrandomized Research Design

Description: Logic of causal inference in research design. Obstacles to causal inference, faulty measurement, un-representativeness, spuriousness, specification errors, and confounds, Experimental and quasi-experimental designs, with inferential pitfalls peculiar to each design. Statistical procedures to illustrate the logic behind various data analytic approaches and the different problems that can limit conclusions derived from these tools.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

SRAM 941 Intermediate Statistics: Experimental Methods**Crosslisted with:** EDPS 941**Prerequisites:** EDPS 859 or EDPS 942**Description:** Computation, interpretation, and application of analysis of variance techniques, including factorial and mixed model designs. Computer and microcomputer software accessed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 942, SRAM 942**SRAM 942 Intermediate Statistics: Correlational Methods****Crosslisted with:** EDPS 942**Prerequisites:** EDPS 859 or EDPS 941**Description:** Various correlational-based statistical procedures presented, including linear and nonlinear regression, multiple regression, statistical control, analysis of interactions, the general linear model, factor analysis, and discriminant analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 941, SRAM 941**SRAM 946 Psychology of Survey Response****Crosslisted with:** PSYC 946**Description:** Cognitive and communicative processes affect on dynamics of survey interviewing and relationships to principles of survey design. Effects of question wording on comprehension; question order and context on attitude; communicative and retrieval processes on validity of retrospective behavioral reports; and impact of response alternatives on answers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 947 Questionnaire Design****Crosslisted with:** PSYC 947, SOCI 947**Description:** Design of questionnaires for survey research and the theoretical and practical issues arising from them. Selection of appropriate measurement techniques for assessing opinions, past behaviors and events, and factual material.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 970 Theory and Methods of Educational Measurement****Crosslisted with:** EDPS 970**Prerequisites:** EDPS 870**Description:** Presentation of various measurement theories and concepts, including classical true-score theory, reliability and validity, test construction, item response theory, test equating, test bias, and criterion-referenced tests.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 971 Structural Equation Modeling****Crosslisted with:** EDPS 971**Notes:** EDPS 942 and EDPS 970 or equivalents required; EDPS 972 recommended.**Description:** Introduction to the techniques of path analysis, confirmatory factor analysis, and structural equation modeling with emphasis on the set-up and interpretation of different models using the LISREL program. Model testing and evaluation, goodness-of-fit indices, violations of assumptions, specification searches, and power analyses..**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 972 Multivariate Analysis****Crosslisted with:** EDPS 972**Notes:** EDPS 941 and EDPS 942 or equivalents are required.**Description:** Techniques of multivariate analyses, including multivariate analysis of variance and covariance, multivariate multiple regression, multigroup discriminant analysis, canonical analysis, repeated measures (Multivariate model), and time series. Mathematical models presented and analyzed. Instruction complemented by appropriate statistical software packages.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** EDPS 980**SRAM 998D Seminar in Special Topics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**SRAM 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Format:** IND

Teaching, Learning and Teacher Education (TEAC)

TEAC 800 Inquiry into Teaching and Learning**Description:** Contemporary educational research from multiple theoretical perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 801 Curriculum Inquiry****Description:** The relationship between curriculum theory and/or research to educational practices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 802 Contemporary Children's Literature: Principles and Practices

Crosslisted with: TEAC 402

Prerequisites: TEAC 302 and successful completion of student teaching or permission.

Description: Contemporary literature for children, all forms and genres; development of meaningful and creative learning activities for children; professional readings and research related to children's literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 803 Student Teaching Seminar

Prerequisites: Parallel enrollment in TEAC 897

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 803A Student Teaching Seminar: Elementary (K-6)

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803B Student Teaching Seminar: Secondary Education

Prerequisites: Parallel enrollment in TEAC 897

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 803G Student Teaching Seminar: Elementary Foreign Language

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803I Student Teaching Seminar: Secondary Art

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803N Student Teaching Seminar: Secondary Language Arts

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803P Student Teaching Seminar: Secondary Mathematics

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803Q Student Teaching Seminar: Middle School

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803R Student Teaching Seminar: Secondary Modern Language

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803V Student Teaching Seminar: Secondary Science

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803W Student Teaching Seminar: Secondary Social Science

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803Y Student Teaching Seminar: Mainstreaming

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 803Z Student Teaching Seminar: Multicultural

Description: Professional development experiences including inquiry-driven projects, on-line discussions and standards-driven professional portfolios.

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 805 Advanced Teaching Strategies

Crosslisted with: ALEC 805, NUTR 806

Description: Contemporary and innovative teaching strategies, emphasizing learner-centered instruction, suitable to teaching in college and postsecondary institutions, outreach programs public schools, and other settings. Students participate in active learning as they apply learning theory in practice, prepare and demonstrate teaching methods, and plan for instruction in discipline areas of their choice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: ALEC 400, ALEC 800; TEAC 905, ALEC 905

TEAC 806 Reading and Writing Disabilities: Adolescents

Crosslisted with: SPED 406, SPED 806

Prerequisites: SPED 212 and TEAC 441 (required for undergraduate students only). Parallel with SPED 406A/806A.

Description: Theory and techniques for assessing and teaching word identification, vocabulary, comprehension and writing skills in grades 7 to 12.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

TEAC 806A Reading Center Practicum II

Crosslisted with: SPED 406A, SPED 806A

Prerequisites: SPED 212 and TEAC 441 (required for undergraduate students only). Parallel with SPED 406/806.

Notes: Requires two hours per week in a Reading Center.

Description: Teaching and/or tutoring experience evaluating and instructing students with reading problems in a Reading Center.

Assessment, instructional planning, delivery of instruction, writing diagnostic reports and parent communication.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LAB

TEAC 808 Improvement of Instruction in School Mathematics

Crosslisted with: TEAC 408

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 808A Improvement of Instruction in School Mathematics Primary: K-3

Crosslisted with: TEAC 408A

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 808B Improvement of Instruction in School Mathematics Elementary: 4-6

Crosslisted with: TEAC 408B

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 808E Improvement of Instruction in School Mathematics Secondary: 7-12

Crosslisted with: TEAC 408E

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 808J Improvement of Instruction in School Mathematics Special Topics

Crosslisted with: TEAC 408J

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 810 Educational Program for Kindergarten Children

Crosslisted with: TEAC 410

Description: Recent developments in education of children and their bearing on the selection and guidance of appropriate activities and materials for the kindergarten. Related functions of home, school, and other educational agencies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 811 Reading Processes and Practices**Crosslisted with:** TEAC 411**Description:** Overview of reading processes and programs with attention to strategies for comprehension and word identification, approaches, and materials. A. Teaching Reading B. Special Topics in Reading C. Response to Intervention - Reading**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 811A Teaching Reading****Crosslisted with:** TEAC 411A**Description:** Overview of reading processes and programs with attention to strategies for comprehension and word identification, approaches, and materials.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 811B Special Topics in Reading****Crosslisted with:** TEAC 411B**Description:** Overview of reading processes and programs with attention to strategies for comprehension and word identification, approaches, and materials.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 811C Response to Intervention - Reading****Crosslisted with:** TEAC 411C**Description:** Overview of reading processes and programs with attention to strategies for comprehension and word identification, approaches, and materials.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 812 Improvement of Instruction in Elementary School Science****Crosslisted with:** TEAC 412**Prerequisites:** 12 hrs education including TEAC 315 or permission; teaching experience or student teaching**Description:** Techniques, plans, and procedures for improving instruction in elementary school science. Current practices, issues, and trends; evaluation of instructional materials.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 813 Studies in Teaching English as a Second Language****Crosslisted with:** TEAC 413**Description:** Preparation for teaching K-12 learners whose language of nurture is not English.**Credit Hours:** 1-15**Min credits per semester:** 1**Max credits per semester:** 15**Max credits per degree:** 15**Format:** LEC**TEAC 813A Second Language Acquisition****Crosslisted with:** TEAC 413A**Description:** Theoretical exploration of how second / additional languages are learned.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 813B ESL: Teaching and Curriculum****Crosslisted with:** TEAC 413B**Description:** Preparation for teaching K-12 learners whose language of nurture is not English**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 813D World Languages Assessment****Crosslisted with:** TEAC 413D**Description:** Preparation for teaching K-12 learners whose language of nurture is not English**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 813E Special Topics in TESOL****Crosslisted with:** TEAC 413E**Description:** Individual or group study of specific and timely topics in the teaching of English to speakers of other languages (TESOL)**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 813J Intercultural Communication****Description:** Introduction to intercultural communication and the theoretical and methodological tools needed to understand the tenets and implications of intercultural communication for application in personal and professional practices. Readings will deal with misunderstandings and the impact of cultural factors on the making of meaning, as well as discrimination and the impact of unequal power relations on communication, media impact in a globalized world, language, identity and communication, and intercultural competence.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 813K Linguistics for Language Teachers**Crosslisted with:** TEAC 413K**Description:** An introduction to basic concepts in linguistics such as phonetics, phonology, morphology, syntax, semantics, neurolinguistics, discourse analysis and language variation. Designed for teachers (or future teachers) of English as an additional language, but also for world language teachers, classroom activities feature identifying theoretical underpinnings of practical language issues and connect them to questions language learners will have.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** ESL and Linguistics**TEAC 813M Teaching Multilingual Learners in Content Areas****Crosslisted with:** TEAC 413M**Notes:** Required for English Language Learner (ELL) certification.**Description:** Theory and pedagogy in the teaching of multilingual learners at all levels of K-12 education. Identify and design linguistically and culturally responsive instruction for multilingual learners in the content areas (e.g. language arts, science, mathematics, social sciences)**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 813P Teaching English as an International Language****Crosslisted with:** TEAC 413P**Description:** Methodologies for teaching English to speakers of other languages (TESOL) in domestic and international settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 814 Evaluation in Career and Technical Education****Crosslisted with:** CYAF 814**Description:** Two aspects of evaluation in the classroom: 1) selection and use of evaluation in assessing learning, and 2) consideration of conceptual and methodological issues in conducting evaluation to determine and account for the effectiveness of programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 815 Studies in Dual Language Education****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 815A Foundations of Dual Language Education****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 815B Special Topics****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 815E Emerging Reading and Language****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 815J Spanish in the Content Areas****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 816 Inclusive Early Childhood Methods****Crosslisted with:** TEAC 416**Prerequisites:** Admission to the Inclusive Early Childhood Teacher Education Program; CYAF 374 and CYAF 374L.**Description:** The creation and practice of developmentally appropriate instruction in curricular areas for K to 3rd grades. Role of the teacher and/or facilitator in relationship to the primary curriculum and learning environment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**TEAC 816A Unified Primary Schooling: Curriculum****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 816B Unified Primary Schooling: Interdisciplinary Planning****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 816D Unified Primary Schooling: Methods and Teaching K-3****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 817 Emerging Reading and Language****Prerequisites:** Elementary endorsement**Description:** Research, theory and practice associated with literacy development in children from birth to age 8. Language and concept development, emerging reading and writing behaviors, appropriate materials and evaluation within a holistic view teaching and learning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 818 Teaching Writing in K-12 Schools**Crosslisted with:** TEAC 418**Description:** Learning and teaching of writing with consideration given to developmental factors of children and adolescents.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 820 Teaching Foreign Language in the Elementary School****Crosslisted with:** TEAC 420**Description:** Theory, research and practice of most recent foreign language models and strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 822 Principles and Practices in Social Studies Education****Description:** Current issues and trends in the curriculum and teaching of social studies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 822A Principles and Practices in Social Studies Education: Special Topics****Description:** Current issues and trends in the curriculum and teaching of social studies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 825 Work-Based Learning/Coordinating Techniques****Crosslisted with:** TEAC 425, EDAD 825**Description:** Foundation and scope of current and projected vocational cooperative education programs and general education work experience. Coordination techniques, selection and placement, instructional procedures, youth leadership activities, organization and administration, and evaluation of cooperative occupational education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 828 Improvement of Instruction in Industrial Education****Description:** Special contemporary curricular and teaching aspects of industrial education. Research, curriculum content, teaching strategies, and the application to the instructional setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 829 Instructional Communication****Crosslisted with:** COMM 427, TEAC 429, COMM 827**Prerequisites:** COMM 101.**Description:** Advanced introductory course in instructional communication, focusing on understanding variables associated with the communication process in instructional settings and managing instructional communication more effectively. Provides an experimental and a cognitive understanding of the role of communication in the instructional process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 830 Introduction to Philosophy of Education****Crosslisted with:** TEAC 430**Description:** Fundamental ideas and skills that students can use to begin to form personal philosophical perspectives on education that can be justified intellectually, practically, and ethically. Using case studies of realistic school situations and the theoretical work of a range of writers in education, students explore conceptions of teaching, learning, curriculum, and the relationship between school and society.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 831 Studies in the Foundations of Education****Crosslisted with:** TEAC 431**Description:** Social and cultural analyses of curriculum, teaching, and education policy from disciplinary perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC**TEAC 831A Studies in the Foundations of Education - The Anthropology of Education****Crosslisted with:** TEAC 431A**Description:** Social and cultural analyses of curriculum, teaching, and education policy from disciplinary perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 831J Studies in the Foundations of Education - Special Topics****Crosslisted with:** TEAC 431J**Description:** Social and cultural analyses of curriculum, teaching, and education policy from disciplinary perspectives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 832 Higher Education in America****Crosslisted with:** TEAC 432, EDAD 832**Description:** History and development of America's colleges and universities and a study of some recent trends and problems in higher education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 833 Comparative Education**Crosslisted with:** TEAC 433**Description:** Foundations, trends, and problems of selected national systems of education as seen in cultural perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 833A Comparative Education Survey****Crosslisted with:** TEAC 433A**Description:** Comparative Education investigates origins, goals, organization, challenges, and accomplishments of various countries' school systems with intentional comparisons to American practices.

The 'A' format is a survey course that considers examples from all over the world. The 'B' format focuses on a single country (plus the U.S. for comparative purposes) and includes overseas travel-study (e.g., to South Korea, South Africa, or Chile) and visits to schools in the visited countries.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 833B Comparative Education: Special Topics/Travel Study****Crosslisted with:** TEAC 433B**Notes:** This course could be taken more than once for additional credits assuming the student uses it for travel-study to different places. For example, a student could not visit South Korea twice with the same professor teaching the same syllabus, but could visit South Korea once (as one 3-hour course) and South Africa (as another 3-hour course).**Description:** Investigates origins, goals, organization, challenges, and accomplishments of various countries' school systems with intentional comparisons to American practices. The 'B' format focuses on a single country (plus the U.S. for comparative purposes) and includes overseas travel-study (e.g., to South Korea, South Africa, or Chile) and visits to schools in the visited countries.**Credit Hours:** 3-9**Min credits per semester:** 3**Max credits per semester:** 9**Max credits per degree:** 9**Format:** FLD**TEAC 834 Ethics and Education****Crosslisted with:** TEAC 434**Description:** Basic issues in ethics and education. Using theoretical material and case studies, students consider such ideas and issues as the nature of moral judgment, equality, justice, caring, and respect for persons, and discuss how educators might respond in ethically justifiable ways to difficult situations they may encounter.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 835 Ethnic Minorities and American Education****Description:** Chronological entry of European immigrant groups into an American society during the formative years of the development of the American public school system. Record of American social and educational history is replete with examples of inter- and intra-group human conflict as each immigrant group attempted to carve out its niche in a New World setting during a period of mass migration from Europe. Historical, sociological, and psychological barriers that became inherent during a dynamic period of nation building.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 836 Latin American Education****Crosslisted with:** TEAC 436**Prerequisites:** 12 hours education, social sciences, or Latin American Studies; or permission.**Description:** Survey of contemporary practices and problems in Latin American education, with special emphasis on the role of education in the national development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 836A Professional Development: Literacy Coaching****Description:** Equip professionals to contextualize their training in the whole school setting. Issues in the teacher change process, professional development practices, program needs assessment and administration, literacy assessment, materials selection, individuals coaching, and intervention design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 836B Professional Development: Special Topics****Description:** Equip professionals to contextualize their training in the whole school setting. Issues in the teacher change process, professional development practices, program needs assessment and administration, literacy assessment, materials selection, individuals coaching, and intervention design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 836E Professional Development in Education: Supervision of Pre-service Teachers****Description:** Equip professionals to contextualize their training in the whole school setting. Issues in the teacher change process, professional development practices, program needs assessment and administration, literacy assessment, materials selection, individuals coaching, and intervention design.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 838 Linguistics for the Classroom School Teacher**Crosslisted with:** TEAC 438**Description:** Discusses the relationships among language and learning, educator and learner discourses, and knowledge and action in connection to sociolinguistics, educational practice, and professional development. Introduction to English language morphology, syntax, phonology, semantics, and pragmatics as well as the language of schooling, its linguistic as well as socio-cultural and cognitive features. Addresses issues of diversity and social justice in education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 839 Literature for Adolescents****Crosslisted with:** TEAC 439**Prerequisites:** Admission to a Teacher Education Program.**Description:** Wide range of young adult literature available for use in schools. Critical and rhetorical tools for responding to a variety of literary texts and techniques for eliciting a wider range of responses to literature; consideration for readers aged 11-16.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 840 Culture and Schooling****Description:** Description and explanation of cultural values as they relate to education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 840A Culture and Schooling: Gender****Description:** Description and explanation of cultural values as they relate to education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 840B Culture and Schooling: Gender and Science****Description:** Description and explanation of cultural values as they relate to education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 840D Culture and Schooling: Special Topics****Description:** Description and explanation of cultural values as they relate to education.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 840E Culture and Schooling: Rural Education****Description:** Description and explanation of cultural values as they relate to education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 840M Language and Power****Description:** Designed for students interested in the relationship of language and power, discourse, knowledge and action both in social theory and in educational practice and across a variety of institutional, community, and individual settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 841 Content Area Reading, Grades 4-12****Crosslisted with:** TEAC 441**Description:** Simultaneous teaching of academic content and functional teaching of reading in the content areas; assessment of comprehension, vocabulary/concept attainment; analyses of text; improvement of content area learning through reading/writing development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 842 Objectives and Methods of Science Teaching****Description:** Development of objectives, course offerings, and organization of subject matter and methods of instruction in science courses. Current national science education curriculum trends.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 842A Objectives and Methods of Science Teaching: Elementary****Description:** Development of objectives, course offerings, and organization of subject matter and methods of instruction in science courses. Current national science education curriculum trends.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 842B Objectives and Methods of Science Teaching: Middle School****Description:** Development of objectives, course offerings, and organization of subject matter and methods of instruction in science courses. Current national science education curriculum trends.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 842D Objectives and Methods of Science Teaching: Secondary and Community College

Description: Development of objectives, course offerings, and organization of subject matter and methods of instruction in science courses. Current national science education curriculum trends.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 842E Objectives and Methods of Science Teaching: Special Topics

Description: Development of objectives, course offerings, and organization of subject matter and methods of instruction in science courses. Current national science education curriculum trends.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 844 School Media Programs

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 844A School Media Programs: Administration

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 844B School Media Programs: Reference

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 844D School Media Programs: Cataloguing

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 844E School Media Programs: Selection

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 844J School Media Programs: Special Topics

Description: Role of the media specialist as a member of the instructional team.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 845 Historical and Philosophical Foundations of American Music Education

Crosslisted with: MUED 845

Prerequisites: Undergraduate degree in MUED

Notes: MUED 845 is required for a graduate degree in music education.

Description: Historical overview of American music education practices from the Singing School tradition to today. Major philosophical influences in American music education, writings regarding aesthetic education, equity, ethical practice, gender, meaning, and profundity. The writings of Stublely, Reimer, Mark, Gary, Hylton, Richmond and others are considered.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 846 Studies in Middle Level Schooling

Description: Historical development, philosophy, and current literature of the middle school.

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 9

Format: LEC

TEAC 846A The Middle Level Curriculum

Crosslisted with: TEAC 446A

Description: Explores the six content areas found in most middle level curricula: Math, Science, Social Studies, Art, Reading and Language Arts. Subject area content and pedagogy appropriate for young adolescents (10-14 years) and how the subject content areas can be integrated in the classroom. Required for all Elementary Education majors on the Middle Level Pathway advising sheet and secondary Special Education majors.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 846B Studies in Middle Level Schooling: Leadership

Description: Historical development, philosophy, and current literature of the middle school.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 846D Studies in Middle Level Schooling: Teacher-Based Advisory

Description: Historical development, philosophy, and current literature of the middle school.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 846E Studies in Middle Level Schooling: Special Topics

Description: Historical development, philosophy, and current literature of the middle school.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

TEAC 848 Introduction to Curriculum Studies

Description: Historical development and philosophy of high school curricula. Review of research on schooling, curriculum trends, and school organizational structures.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 848A Introduction to Curriculum Studies: Elementary Schools

Description: Historical development and philosophy of high school curricula. Review of research on schooling, curriculum trends, and school organizational structures.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 848B Introduction to Curriculum Studies: Middle Schools

Description: Historical development and philosophy of high school curricula. Review of research on schooling, curriculum trends, and school organizational structures.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 848D Introduction to Curriculum Studies: Secondary Schools

Description: Historical development and philosophy of high school curricula. Review of research on schooling, curriculum trends, and school organizational structures.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 848E Special Topics in Curriculum

Description: Historical development and philosophy of high school curricula. Review of research on schooling, curriculum trends, and school organizational structures.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 849 Studies in Assessment and Leadership for Learning

Description: Preparation for assessing K-12 learners and leading K-12 Teacher Learning Communities.

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Format: LEC

TEAC 849A Classroom Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 849B Large-scale Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 849E Leadership in Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 849J Leading Classroom Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 849K Special Topics in Assessment and Leadership for Learning

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 851 Learning and Teaching Principles and Practices

Crosslisted with: TEAC 451

Prerequisites: Admission to the Teacher Education Program; completion of 80 percent of subject-area course work with a 2.5 GPA or better.

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851I Learning and Teaching Principles and Practices: Secondary Art

Crosslisted with: TEAC 451I

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851L Learning and Teaching Principles and Practices: Information Technology

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 851N Learning and Teaching Principles and Practices: Secondary Language Arts

Crosslisted with: TEAC 451N

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851P Learning and Teaching Principles and Practices: Secondary Mathematics

Crosslisted with: TEAC 451P

Prerequisites: Admission to the Teacher Education Program; completion of 80 percent of subject-area course work with a 2.5 GPA or better.

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines. Innovative methodology and planning, teaching, and evaluating math lessons for diverse learners.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851R Learning and Teaching Principles and Practices: Secondary Modern Languages

Crosslisted with: TEAC 451R

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851V Learning and Teaching Principles and Practices: Secondary Science

Crosslisted with: TEAC 451V

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines. Investigates issues in secondary science learning and teaching with emphasis on contextualized practice in each field as well as interdisciplinary approaches to planning, research, testing, laboratory safety, and the affective and cognitive needs of diverse learners.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 851W Learning and Teaching Principles and Practices: Secondary Social Science

Crosslisted with: TEAC 451W

Description: Theoretical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

TEAC 852 Curriculum Principles and Practices

Crosslisted with: TEAC 452

Prerequisites: Admission to the Teacher Education Program; completion of 80 percent of subject-area course work with 2.5 GPA or better.

Description: Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 852I Curriculum Principles and Practices Secondary Art

Crosslisted with: TEAC 452I

Description: Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 852N Curriculum Principles and Practices Secondary Language

Crosslisted with: TEAC 452N

Description: Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 852P Curriculum Principles and Practices Secondary Mathematics

Crosslisted with: TEAC 452P

Description: Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 852R Curriculum Principles and Practices Secondary Modern Languages

Crosslisted with: TEAC 452R

Description: Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 852V Curriculum Principles and Practices Secondary Science**Crosslisted with:** TEAC 452V**Description:** Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 852W Curriculum Principles and Practices Secondary Social Science****Crosslisted with:** TEAC 452W**Description:** Focus on practical issues in the area of teaching and learning as applied to the individual disciplines.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 854 Literature in Education****Crosslisted with:** TEAC 454**Description:** Comparative analyses of literature and the role of the reader as meaning maker in educational settings.**Credit Hours:** 3-9**Min credits per semester:** 3**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**TEAC 854A Literature in Education: Literary Response and Analysis****Crosslisted with:** TEAC 454A**Description:** Comparative analyses of literature and the role of the reader as meaning maker in educational settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 854B Literature in Education: Multiethnic Literature for Children and Adolescents****Crosslisted with:** TEAC 454B**Description:** Comparative analyses of literature and the role of the reader as meaning maker in educational settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 854E Literature in Education: Special Topics****Description:** Comparative analyses of literature and the role of the reader as meaning maker in educational settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 855 Teaching Learners to Learn****Crosslisted with:** EDAD 855, EDPS 855, NUTR 855, SPED 855**Description:** Effective teachers facilitate student learning. Facilitating student learning depends on understanding learning principles and on designing instruction that is compatible with learning principles. Instructors can provide learning-compatible instruction that helps students learn more effectively and ultimately teaches them how to learn. Assists teachers to teach in learning-compatible ways and helps them embed within their curriculum a program for teaching learners to learn.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 856A Learning Models: Unified Learning Model****Description:** Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. Unified learning model.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 856B Learning Models: Theories and Applications Specific to Reading/Writing Instruction****Description:** Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. Theories and applications specific to reading/writing instruction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 856L Learning Models: Theories and Applications Specific to Instructional Technology****Description:** Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. Theories and applications specific to instructional technology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 856P Learning Models: Theories and Applications Specific to Mathematics Instruction****Description:** Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. A. Unified learning model. Theories and applications specific to mathematics instruction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 856V Learning Models: Theories and Applications Specific to Science Instruction

Description: Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. A. Unified learning model. Theories and applications specific to science instruction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 856W Learning Models: Special Topics

Description: Introduction to current theoretical models of learning pertaining to schooling. Learner characteristics and applications to traditional classroom settings. Special topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 857B Nebraska Writing Project

Crosslisted with: ENGL 857B

Description: Topics in writing instruction, explored via the National Writing Project Institute model, for K-12 and college teachers of writing in all curricular areas.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 858 Utilization of Modern Technology

Description: Strategies of incorporating modern technology into the professional workplace; provides a thorough understanding of the operation and evaluation of integrating technology into the curriculum.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 859 Designing Learning Experiences

Description: This reading and design seminar focuses on approaches to creating learning experiences. Drawing on behavior science, cognitive modeling, constructivism, sociocultural, problem-based, and social justice perspectives on learning—the course supports generative explorations in learning, design, and technology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 860 Production and Utilization of Instructional Materials

Description: The use of technology to support the development of efficient and effective learning materials through the application of learning and design principles. Emphasis is on the development of skills for the actual production and utilization of instructional materials in ways that support teaching.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 861 Education for a Pluralistic Society: Foundation and Issues

Description: Educational practices and policies for people from historically oppressed groups in the United States Foundation of multicultural education. Discussion of contemporary educational issues within the context of multicultural and cultural diversity. Critique of curricular materials and resources promoting a multicultural perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 861A Special Topics in Education for a Pluralistic Society

Description: Introduction to the field of Democratic Education to explore the defining issues, questions, and problems of the field. Readings and discussions on a breadth of issues related to democratic education including the purposes of schools, ideology and curriculum, the relationship between social class and citizen-production in schooling, and the role of discussion, deliberation, and trust in democratic schooling. Students will undertake the issue of how we are to prepare teachers in ways that promote democracy both within teacher education as well as K-12. Undergirding all of these conversations will be explicit attention to diversity, power, and voice. The role of social capital in democratic society, exploring how changing participation and group membership trends in the United States have consequences for democratic health.

Credit Hours: 1-9

Min credits per semester: 1

Max credits per semester: 9

Max credits per degree: 9

Format: LEC

TEAC 873 Approaches to Middle School General Music

Crosslisted with: MUED 473, MUED 873

Prerequisites: MUED 344.

Description: For prospective new and experienced general music/middle school teachers. Characteristics of middle school students, materials, methodology, guitar and recorder techniques, and curriculum development.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Music Education

TEAC 874 Topics in Chemical Pedagogy

Crosslisted with: CHEM 874

Description: Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

TEAC 874A Topics in Chemical Pedagogy - Green Chemistry**Crosslisted with:** CHEM 874A**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874D Topics in Chemical Pedagogy - Demonstrations for High School Chemistry****Crosslisted with:** CHEM 874D**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874E Topics in Chemical Pedagogy - Experiments for High School Chemistry****Crosslisted with:** CHEM 874E**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874J Topics in Chemical Pedagogy - Developing a Safety Culture****Crosslisted with:** CHEM 874J**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**TEAC 874K CHEM OF LIFE PROCESS****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874L Topics in Chemical Pedagogy - Addressing Misconceptions****Crosslisted with:** CHEM 874L**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874M Topics in Chemical Pedagogy - Mathematics Integration****Crosslisted with:** CHEM 874M, MATH 874M**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. May be counted towards the MAT and MScT degrees in mathematics and statistics, not the MA, MS, or PhD. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874N Topics in Chemical Pedagogy - Inquiry Strategies****Crosslisted with:** CHEM 874N**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 874P Topics in Chemical Pedagogy - Chemistry in the Workplace****Crosslisted with:** CHEM 874P**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 874Y Topics in Chemical Pedagogy - Graphing Calculator Activities**Crosslisted with:** CHEM 874Y**Description:** Topical chemistry content for high school teachers organized according to the National Science Education Standards. A maximum combined total of 12 hours from TEAC *869 and/or *874 may be counted toward a masters degree. Credit in this course will not count towards a graduate degree in chemistry. Courses are Web-based.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875 Chemical Pedagogy in the High School Laboratory****Crosslisted with:** CHEM 875**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875A Chemical Pedagogy in the High School Laboratory - Small-scale Experiments****Crosslisted with:** CHEM 875A**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875B Chemical Pedagogy in the High School Laboratory - Technology Integration****Crosslisted with:** CHEM 875B**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 875E Chemical Pedagogy in the High School Laboratory - Inquiry Experiments****Crosslisted with:** CHEM 875E**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875K Chemical Pedagogy in the High School Laboratory - At-home Experiments****Crosslisted with:** CHEM 875K**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875P Chemical Pedagogy in the High School Laboratory - Probe Experiments****Crosslisted with:** CHEM 875P**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 875T Chemical Pedagogy in the High School Laboratory - Traditional Experiments****Crosslisted with:** CHEM 875T**Description:** Laboratory-based courses addressing specific issues connected with teaching laboratory work in high school chemistry programs. Credit in this course will not count towards a graduate degree in chemistry.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880 Teaching with Technology****Crosslisted with:** TEAC 480**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880A Teaching with Technology: Survey of Instructional Technology****Crosslisted with:** TEAC 480A**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 880B Teaching with Technology: Designing Instructional Technology K-12**Crosslisted with:** EDAD 880B, TEAC 480B**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880E Teaching with Technology: Instructional Technology in Mathematics****Crosslisted with:** TEAC 480E**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880J Teaching with Technology: Instructional Technology in Language Arts****Crosslisted with:** TEAC 480J**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880K Teaching with Technology: Instructional Technology in Science****Crosslisted with:** TEAC 480K**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880L Teaching with Technology: Instructional Technology in Social Sciences****Crosslisted with:** TEAC 480L**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880M Teaching with Technology: Technology Supported Assessment and Evaluation****Crosslisted with:** TEAC 480M**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880N Teaching with Technology: Web Teaching****Crosslisted with:** TEAC 480N**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 880P Teaching with Technology: Special Topics****Crosslisted with:** TEAC 480P**Description:** Survey and analysis of the application of technology to improve teaching. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of teaching strategies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 881 Music in Early Childhood Education****Crosslisted with:** MUED 881**Prerequisites:** MUED 344 or 370**Description:** Prepares the teacher of the young child (3-8 years) in the musical skills, methodology, and materials needed to carry out a successful program of music in the public and private schools, the nursery schools, and day-care centers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 882 Instructional Applications of Computers-Practicum****Crosslisted with:** TEAC 482**Prerequisites:** Permission.**Description:** A task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised tasks centered experiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC

TEAC 882A Modern Programming Tools

Description: A task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised tasks centered experiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 882B Database and Interactive Web Development

Description: A task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised tasks centered experiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 882D Artificial Intelligence, and APIs in the Design of Learning Experiences

Crosslisted with: TEAC 482D

Description: Task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised task-centered experiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 882E Advanced Web Design and Management

Description: A task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised tasks centered experiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 882J Creation of Instructional Activities for Portable Devices

Description: A task-oriented practicum for the demonstration of fluency with advanced technology and the application of instructional design to the development of educational resources. Supervised tasks centered experiences.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 883 Curriculum Design and Language Program Direction

Crosslisted with: MODL 883

Description: Examination of curriculum design and language program direction for foreign/second language learning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 886 Assessment, Evaluation, and Instruction of At-Risk Readers

Crosslisted with: SPED 886

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

TEAC 886A Special Topics in Literacy Assessment

Crosslisted with: SPED 886A

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 886B Internship in Literacy Assessment and Instruction

Crosslisted with: SPED 886B

Notes: TEAC/SPED 886 includes case study and planning for special student populations.

Description: Analysis and use of informal and formal assessment and instructional strategies in clinic and classroom settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

TEAC 887 Effecting High School Improvement

Description: The relationships and interactions among the high school student, a teacher, and the curriculum to the issues of school district, higher education, philanthropy, state department of education, and federal involvement in high school improvement efforts. The imperative and challenges for improving high schooling for all students.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 888 Teacher as Scholarly Practitioner

Prerequisites: TEAC 800 and 801, or permission

Description: Seminar on the principles of practitioner inquiry and development of a proposal for an inquiry project.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 888A Special Topics in Inquiry

Description: Seminar on the principles of practitioner inquiry and development of a proposal for an inquiry project.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 889 Masters Seminar**Prerequisites:** Permission**Description:** Working with a faculty mentor on either an individual or small-group basis, the student plans, conducts, and reports a summative work project.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 890 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**TEAC 891 Special Topics in Human Sciences****Crosslisted with:** HUMS 891, NUTR 891, SLPA 891, TMTD 891, CYAF 891**Description:** Aspects of human sciences not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 892 Special Topics in Education****Crosslisted with:** EDAD 892, EDPS 892, EDUC 892, SPED 892, CYAF 892**Prerequisites:** EDPS 859 or parallel; EDPS 859 or equivalent**Description:** Aspects of education not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 893 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**TEAC 893N Workshop Seminar****Crosslisted with:** EDAD 893N, EDPS 893N, SPED 893N**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**TEAC 894 Professional Practicum Experiences****Prerequisites:** Admission to Teacher Education Program**Notes:** TEAC 894 does not count toward the MA or MEd degree. P/N only.**Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894A Professional Practicum Experiences: Elementary (K-6)****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894B Professional Practicum Experiences: Elementary Art****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894C Professional Practicum Experiences: Dual Language****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894E Professional Practicum Experiences: English as a Second Language****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894G Professional Practicum Experiences: Elementary Foreign Language****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894I Professional Practicum Experiences: Secondary Art****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 894J Professional Practicum Experiences: Business Education****Description:** Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD

TEAC 894L Professional Practicum Experiences: Information Technology

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894M Professional Practicum Experiences: Industrial Education

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894N Professional Practicum Experiences: Secondary Language Arts

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894O Professional Practicum Experiences: Marketing Education

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894P Professional Practicum Experiences: Secondary Mathematics

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894Q Professional Practicum Experiences: Middle School

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894R Professional Practicum Experiences: Secondary Modern Language

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894T Professional Practicum Experiences: Reading

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894V Professional Practicum Experiences: Secondary Science

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894W Professional Practicum Experiences: Secondary Social Science

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894Y Professional Practicum Experiences: Mainstreaming

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 894Z Professional Practicum Experiences: Multicultural

Description: Guided observations and/or clinical experiences in schools and/or agencies offering programs for children/youth.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 895 Independent Study

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

TEAC 895A Nebraska Writing Project Internship

Crosslisted with: ENGL 895A

Prerequisites: Permission

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 896 Problems in Secondary Education

Prerequisites: Permission.

Description: Develop plans, procedures, or experiments directed to the improvement of the curriculum or administration of the secondary school.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 897 Student Teaching Internship

Prerequisites: Admission by application only

Notes: This course will not count towards the MA or MEd degree. P/N only

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897A Student Teaching Internship: Elementary (K-6)

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897B Student Teaching Internship: Elementary Art

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897D Student Teaching Internship: Elementary Physical Education

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897E Student Teaching Internship: English as a Second Language

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897G Student Teaching Internship: Elementary Foreign Language

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897I Student Teaching Internship: Secondary Art

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897J Student Teaching Internship: Business Education

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897K Student Teaching Internship: Health

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897M Student Teaching Internship: Industrial Education

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897N Student Teaching Internship: Secondary Language Arts

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897P Student Teaching Internship: Secondary Mathematics

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897Q Student Teaching Internship: Middle School

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897R Student Teaching Internship: Secondary Modern Language

Description: Supervised teaching experience in schools.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: FLD

TEAC 897U Student Teaching Internship: Secondary Physical Education**Description:** Supervised teaching experience in schools.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 897V Student Teaching Internship: Secondary Science****Description:** Supervised teaching experience in schools.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 897W Student Teaching Internship: Secondary Social Science****Description:** Supervised teaching experience in schools.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 897Y Student Teaching Internship: Mainstreaming****Description:** Supervised teaching experience in schools.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** FLD**TEAC 897Z Student Teaching Internship: Multicultural****Description:** Supervised teaching experience in schools.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 1**Format:** FLD**TEAC 898 Problems in Elementary Education****Crosslisted with:** TEAC 498**Prerequisites:** Permission.**Description:** Opportunities to develop plans, procedures, experiments, and models directed to the improvement of elementary school education on an independent study basis.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**TEAC 902 Colloquium in Educational Policy and Practice****Description:** Educational policy and practice and their interconnection.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 902A Special Topics in Educational Policy and Practice****Description:** Educational policy and practice and their interconnection.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 903 Current Trends in the Education of Young Children****Description:** Participation in special problems of teachers in service. Guidance, evaluations, research.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 905 Practicum in Postsecondary Teaching****Crosslisted with:** ALEC 905**Prerequisites:** ALEC 805 or permission**Description:** Work with a faculty mentor in a discipline of choice and an instructional supervisor to prepare instruction and teach students in a postsecondary setting. Practicum students are assisted in arranging for the practicum and are provided consultation and feedback during the practicum. Lesson planning and reflective papers are part of the practicum experience.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 1**Format:** FLD**TEAC 907 Seminar in Elementary School Mathematics****Prerequisites:** TEAC 808 or equivalent**Description:** Theories, literature, and research procedures relative to elementary mathematics education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 908 Seminar in Teacher Education****Description:** Introduction to the field of teacher preparation in the United States. Includes media artifacts, books, and articles representing a wide range of ideological positions intended to deepen knowledge of key issues in teacher education. Explore how different approaches to teacher preparation address the achievement gap, discrepancies in teacher quality, and injustice. This course addresses issues of diversity and social justice in education.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC

TEAC 908A Seminar in Teacher Education: Supervision of Pre-service Teachers**Description:** Overview of literature and scholarship in teacher education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 908B Seminar in Teacher Education: Teacher Development****Description:** Overview of literature and scholarship in teacher education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 908D Seminar in Teacher Education: Initial Teacher Preparation****Description:** Overview of literature and scholarship in teacher education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 908E Seminar in Teacher Education: Special Topics in Teacher Education****Description:** Overview of literature and scholarship in teacher education.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 911 Seminar in Elementary School Science****Prerequisites:** 12 hrs laboratory science including courses in both physical and biological fields; TEAC 403 or 804 or equivalent; teaching experience**Description:** Literature which deals with research and experimentation in science for the elementary school. Aspects of the teaching and supervision of elementary school science that require investigation and research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 920 Seminar in Curriculum and Teaching of Career and Technical Education****Description:** Current research and theory within the curriculum and teaching of career and technical education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 921 Seminar in Literacy Studies****Description:** Research in literacy and schooling. This course examines and fosters research in language and culture from inter and intra-disciplinary perspectives including linguistics and education, linguistic anthropology, literacy studies, language and gender, sociolinguistics, sociology, and education policy studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 921A Seminar in Literacy Studies: Curriculum and Teaching****Description:** Research in literacy and schooling.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 921B Seminar in Literacy Studies: Special Topics****Description:** Research in literacy and schooling.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**TEAC 921D Seminar in Literacy Studies: Language, Culture, and Education****Crosslisted with:** ANTH 921D**Description:** Research in literacy and schooling.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Format:** LEC**TEAC 922 Seminar in the Learning and Teaching of Foreign Languages****Prerequisites:** Undergraduate teaching major in a foreign language and teaching experience in a foreign language.**Description:** Critical review and evaluation of current literature, research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 15**Format:** LEC**TEAC 922A The Interpretive Mode: Reading and Listening in the Foreign Language Classroom****Description:** Critical review and evaluation of current literature, research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 922B The Interpretive Mode: Reading and Listening in the Spanish Language Classroom****Description:** Critical review and evaluation of current literature, research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 922C The Interpretive Mode: Reading and Listening in the German Language Classroom****Description:** Critical review and evaluation of current literature, research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 922D The Interpretive Mode: Reading and Listening in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922E Interpersonal and Presentational Writing in the Foreign Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922F Interpersonal and Presentational Writing in the Spanish Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922G Interpersonal and Presentational Writing in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922H Interpersonal and Presentational Writing in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922J Interpersonal and Presentational Speaking in the Foreign Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922K Interpersonal and Presentational Speaking in the Spanish Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922L Interpersonal and Presentational Speaking in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922M Interpersonal and Presentational Speaking in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922N Assessment in the Foreign Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922O Assessment in the Spanish Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922P Assessment in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922Q Assessment in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922R Planning in the Foreign Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922S Planning in the Spanish Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922T Planning in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922U Planning in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922T Planning in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922U Planning in the Chinese Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922V Technology-Enhanced Language Instruction

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922W Technology-Enhanced Spanish Language Instruction

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922X Technology-Enhanced German Language Instruction

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922Y Technology-Enhanced Chinese Language Instruction

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 922Z Teaching for Intercultural Communicative Competence in the Foreign Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 923 Seminar in the Curriculum and Teaching of Secondary School Mathematics

Prerequisites: Undergraduate teaching major and teaching experience in mathematics

Description: Critical evaluation of current literature, yearbooks, research, and experiments in the curriculum and teaching of mathematics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924 Seminar in the Curriculum and Teaching of Science

Prerequisites: Undergraduate teaching major and teaching experience in science, and TEAC 842 and EDPS 859

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924A Seminar in the Curriculum and Teaching of Science: Elementary

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924B Seminar in the Curriculum and Teaching of Science: Middle School

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924D Seminar in the Curriculum and Teaching of Science: Secondary

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924E Seminar in the Curriculum and Teaching of Science: Inclusive Science Teaching

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 924J Seminar in the Curriculum and Teaching of Science: Special Topics

Description: Exploration of current literature, yearbooks, research, and experiments in the curriculum and teaching of science.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 925 Seminar in the Curriculum and Teaching of Social Sciences

Description: Current research and literature in social sciences education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 925A Seminar in the Curriculum and Teaching of Social Sciences: Elementary

Description: Current research and literature in social sciences education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 925B Seminar in the Curriculum and Teaching of Social Sciences: Middle School

Description: Current research and literature in social sciences education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 925D Seminar in the Curriculum and Teaching of Social Sciences: Secondary

Description: Current research and literature in social sciences education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 925E Seminar in the Curriculum and Teaching of Social Sciences: Great Plains Studies

Description: Current research and literature in social sciences education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 925G Seminar in the Curriculum and Teaching of Social Sciences: Special Topics in Social Sciences

Description: Current research and literature in social sciences education.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 930 Sociological/Anthropological Research Methods in Education

Crosslisted with: CYAF 930, EDPS 930, NUTR 930

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 15

Format: LEC

TEAC 930A Ethnographic Methods

Crosslisted with: CYAF 930A, EDPS 930A, NUTR 930A, ANTH 930A

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 930B Special Topics in Qualitative and/or Quantitative Research Methods

Crosslisted with: CYAF 930B, EDPS 930B, NUTR 930B

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

TEAC 930D Discourse Analysis Across School, Home and Community Settings

Crosslisted with: CYAF 930D, EDPS 930D, NUTR 930D

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 930E Introduction to Linguistic Analysis of Classroom Interaction

Crosslisted with: CYAF 930E, EDPS 930E, NUTR 930E

Description: Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 930J Hermeneutic Traditions in Education**Crosslisted with:** CYAF 930J, EDPS 930J, NUTR 930J**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 930K Quantitative Research Traditions in Education****Crosslisted with:** CYAF 930K, EDPS 930K, NUTR 930K**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 930M Introduction to Multimodal Textual Analysis****Crosslisted with:** CYAF 930M, EDPS 930M, NUTR 930M**Description:** Empirical and theoretical research into the sociocultural problems and the lived experiences of people across educational, family and community settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 931 Research in the History of Education****Description:** Historical research methods in education culminating in the research and writing of a historical article as publication report.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 932 Contract Studies in International Education****Prerequisites:** Permission**Description:** Student proposed course of studies in international education: may include field experiences, individual/group research, participation in mini-seminars, etc.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 935 Seminar in Qualitative Research****Crosslisted with:** EDPS 935**Prerequisites:** EDUC 900K**Description:** Seminar intended for doctoral-level students who have completed an initial qualitative research methodology course and who want to increase their skills in qualitative research. Data collection and analysis strategies and the application of those strategies to research problems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 936 Seminar in College Teaching****Description:** Overview of teaching in post-secondary settings.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 937 Philosophy of Science and Educational Research****Description:** Major themes in philosophy of science and relates these to conceptions of research on human beings and social institutions, particularly as this is applied to schooling. Students consider such fundamental issues as whether educational research is a science, the form and purpose of educational research, and what research might imply for practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 944 Seminar in Curriculum Studies****Description:** Critical examination of issues in curriculum development with an analysis of research and literature on the subject.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**TEAC 944A Curriculum as Aesthetic Text****Description:** Critical examination of issues in curriculum development with an analysis of research and literature on the subject.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 944B Special Topics in Curriculum****Description:** Critical examination of issues in curriculum development with an analysis of research and literature on the subject.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 944D Curriculum Evaluation****Description:** Critical examination of issues in curriculum development with an analysis of research and literature on the subject.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 944E Curriculum as Spatial Text****Description:** Critical examination of issues in curriculum development with an analysis of research and literature on the subject.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

TEAC 946 Instructional Improvement and Decision Making

Description: Study and application of teaching models and techniques based on research, theory, and exemplary practice.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 946A Instructional Assessment

Description: Study and application of teaching models and techniques based on research, theory, and exemplary practice.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 946B Special Topics in Instruction

Description: Study and application of teaching models and techniques based on research, theory, and exemplary practice.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 948 Instructional Leadership: Emerging Trends and Practices

Crosslisted with: EDAD 948

Description: Changing roles for persons engaged in instructional and curricular leadership in educational institutions. Literature on staff development, assessment and evaluation, and effective schools serve as the basis for studying and applying this information to a variety of educational settings. Issues such as teacher empowerment and site-based management, along with cooperative learning provide the focus of the activities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 949 Seminar in Education

Description: Critical analysis of literature and research on teaching, learning, and schooling.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

TEAC 949A Seminar in Education: Special Topics in Education

Description: Critical analysis of literature and research on teaching, learning, and schooling.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 950 Contextual Research in English/Language Arts

Description: Uses of qualitative research in English language arts; interpreting, planning, conducting, and reporting contextual research results.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 951 Seminar in Reading Education

Description: Scholarship in reading education, including the nature, results and implications of past and present research and non-research and contributions of historically significant scholars in the field of reading.

Credit Hours: 3-9

Min credits per semester: 3

Max credits per semester: 9

Max credits per degree: 9

Format: LEC

TEAC 951A Seminar in Reading Education: Research in Reading Education

Description: Scholarship in reading education, including the nature, results and implications of past and present research and non-research and contributions of historically significant scholars in the field of reading.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 951B Seminar in Reading Education: Special Topics

Description: Scholarship in reading education, including the nature, results and implications of past and present research and non-research and contributions of historically significant scholars in the field of reading.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 952 Language and Learning

Description: Role that language plays in empowering and constraining children as they attempt to make sense of their world. Consideration of application of language scholarship for general instruction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 953 Seminar on Writing in the Curriculum

Description: Writing development, writing instruction, and the use of writing in the content areas. Consideration of application of scholarship in writing for general learning and instruction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 957B Nebraska Writing Project**Crosslisted with:** ENGL 957B**Description:** Summer institute for K-12 and college teachers of writing in all curricular areas, taught on the National Writing Project model.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC**TEAC 959 Portfolio in Instructional Technology Competencies****Prerequisites:** Permission**Notes:** No more than six credits of TEAC 959 may be counted towards a masters degree.**Description:** Portfolio components represent a significant contribution to the solution of an instructional problem and reflect broadly the major competencies of instructional technology: problem definition, learner analysis, media selection and message design, production, and evaluation.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**TEAC 960 Topical Seminar in Instructional Technology****Prerequisites:** Permission**Description:** An applied critical analysis of research in a delimited problem at the intersection of learning and technology (e.g., societal influences on learning technologies, virtual reality, artificial intelligence, voice navigation, Deleuze, drones).**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 961 Current Approaches to Elementary Music Education****Crosslisted with:** MUED 961**Prerequisites:** Teaching experience**Description:** Implementation of current programs, materials, and techniques for the improvement of music instruction in the elementary school.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TEAC 989 Psychology of Reading and Writing****Crosslisted with:** EDPS 989**Notes:** This course combines two earlier courses, Psychology of Reading, EDPS 989 (cross listed with TEAC 989) and Seminar in Educational Psychology (Psychology of Writing, EDPS, 991) Prior graduate coursework in literacy or cognitive psychology recommended.**Description:** Study of the research literature on cognitive and motivational processes involved in reading and writing. Readings and classroom discussion will focus on theories and models of reading and writing. Specific topics include the roles of component processes of literacy such as attention, perception, memory, and problem solving, as well as studies of self-regulatory and social influences on literacy development and performance. Literacy research and models are examined at all levels of reading and writing, from early acquisition through high-level reading and writing expertise, as well as with respect to changes in literacy activities tied to new technologies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**TEAC 990 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Format:** LEC**TEAC 991 Field Studies in Education****Crosslisted with:** EDAD 991, NUTR 991**Prerequisites:** Permission**Description:** Identification and solutions of problems associated with program planning; organizational, administrative, and instructional procedures within an institutional setting. Designing, implementing, and evaluating new or modified patterns of operation and teaching within a public school, postsecondary institution, or adult education agency.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**TEAC 992 Nebraska Humanities Project****Crosslisted with:** ENGL 992**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**TEAC 992B Place Conscious Teaching****Crosslisted with:** ENGL 992B**Description:** Theory and practice of teaching writing, literature, and rhetoric in connection with local place, region, and community.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** LEC

TEAC 992L Listening in the German Language Classroom

Description: Critical review and evaluation of current literature, research and theory.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TEAC 993 Workshop Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Format: LEC

TEAC 995 Doctoral Seminar

Prerequisites: Permission

Notes: Intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor.

Description: Outcome-based scholarly activities, individualized or small group basis. Development, execution and reporting on one or more projects addressing the interaction between research and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: LEC

TEAC 995A Doctoral Seminar: Ph.D. Pro-Seminar

Prerequisites: Permission

Notes: Intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor.

Description: Outcome-based scholarly activities, individualized or small group basis. Development, execution and reporting on one or more projects addressing the interaction between research and practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 18

Format: LEC

TEAC 995B Special Topics

Description: Outcome-based scholarly activities, individualized or small group basis. Development, execution and reporting on one or more projects addressing the interaction between research and practice. Intended primarily for doctoral students, although non-doctoral graduate students may be admitted with special permission of the instructor.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 15

Format: LEC

TEAC 996 Individual Research Projects

Prerequisites: Permission

Description: Individual research under faculty supervision.

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 10

Format: IND

TEAC 997 Minor Research

Description: Individual research on approved topics in Elementary Education.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TEAC 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Format: IND

Textiles, Merchandising and Fashion Design (TMFD)

TMFD 803 Apparel Design by Draping

Crosslisted with: TMFD 403

Prerequisites: TMFD 212 and 216

Description: Creative experience in designing apparel through the use of draping techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Format: SDO

Prerequisite for: TMFD 471, TMFD 871; TMFD 823

TMFD 805 Advanced Textiles

Crosslisted with: TMFD 405

Prerequisites: TMFD 206; CHEM 105 or 109 or 113.

Description: Recent advances in the production and performance of fibers, yarns, finishes and dyes for textile products. Lab experiences designed to familiarize the students with standards, methods and equipment for evaluating textile product performance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 806 Textile Testing and Evaluation

Crosslisted with: TMFD 406

Prerequisites: TMFD 206.

Description: Physical and chemical analysis of textiles using standard testing procedures. The calculation, interpretation, and evaluation of test results.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 807 History of Dress**Crosslisted with:** TMFD 407**Prerequisites:** Junior standing, AHIS 101 or 102 or 3 hrs HIST 130 or 131.**Description:** Theoretical approach to the history of dress from ancient times through the twentieth century; examining dress in the context of social, economic, and artistic development of Western culture.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** TMFD 876, ANTH 883**TMFD 808 Textiles, Technology and Culture****Crosslisted with:** TMFD 408**Prerequisites:** Junior standing, TMFD 206, AHIS 101 or 102 or 3 hrs HIST 130 or 131.**Description:** Textiles in the context of social, technical, political, aesthetic, and economic developments in the cultures of Europe, Asia, the Middle East, Africa and the Americas. Emphasis is placed on the relationship between social, technical, and aesthetic qualities of textiles, and their transformations, as well as stylistic similarities and differences across cultural and historical contexts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** TMFD 876, ANTH 883**TMFD 809 Museums: Theory and Practice****Prerequisites:** TMFD 830**Description:** Recommended practices for accessioning, handling, storage, exhibition, and preventative conservation of textiles and dress in museum collections. Philosophical and ethical issues confronting curators and collection managers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 810 Body, Dress and Identity****Crosslisted with:** TMFD 410, WMNS 410A, WMNS 810A**Prerequisites:** Senior standing; 3 hrs PSYC or SOCI; TMFD 123.**Description:** Theories and research findings about the social, cultural, and psychological aspects of clothing and appearance in relation to the self and others. Special emphasis will be placed on relationship(s) between the body, dress, and personal and social identities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 811 Textiles, Fashion, and Design Problems****Prerequisites:** 12 hrs textiles, merchandising, and fashion design and permission**Description:** Selected problems related to textiles, fashion, and design**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Format:** IND**TMFD 811A Textiles, Fashion, and Design Problems: Textiles****Prerequisites:** 12 hrs textiles, merchandising, and fashion design and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** IND**TMFD 811B Textiles, Fashion, and Design Problems: Fashion****Prerequisites:** 12 hrs textiles, merchandising, and fashion design and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** IND**TMFD 811D Textiles, Fashion, and Design Problems: Design****Prerequisites:** 12 hrs textiles, merchandising, and fashion design and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Format:** IND**TMFD 812 Product Development IV: Trend Analysis & Product Conceptualization****Crosslisted with:** TMFD 412**Prerequisites:** SR Standing; Merchandising option & Textile and Apparel Design option: TMFD 312, MRKT 300 and 6 hrs from any of the following: ACCT 200, ECON 200, BLAW 300, FINA 300, MNGT 300. Textile Science option & TMFD Communications option: TMFD 312 and ECON 200.**Description:** Synthesis of process involved in product development from product initiation to the development of market strategies. Career and portfolio development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 813 Merchandising III: Textiles & Apparel Merchandise Development & Retail Strategies****Crosslisted with:** TMFD 413**Prerequisites:** ACCT 200; MRKT 300 and 3 hrs from any of the following: ECON 200, BLAW 300, FINA 300, MNGT 300; TMFD 313 and 314.**Description:** Problems involved in consumer decision making, merchandise development and planning, retail strategies, and marketing practices specific to the textile and apparel industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** TMFD 907

TMFD 814 The Studio Craft Movement from Mid-century to DIY**Prerequisites:** Permission**Description:** An examination of the American studio craft movement and the precedents and contexts that gave rise to its coalescence in the post World War II era. Individual makers and their works will be studied in relation to the broader domains of fine art and design, and in light of the discourses that held sway as the movement emerged, including feminism, environmentalism, the civil rights movement, counter-cultural forces, etc. The textile and fiber arts will be a particular focus of this exploration, examined through conceptual and critical lenses.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 815 Aesthetics and the Quilt****Prerequisites:** Permission**Description:** This course will examine issues in aesthetics as related to both historical and nontraditional quilts. Extensive readings in the areas of aesthetics, contemporary art and craft, critical theory and design theory will support analytical and critical writing about selected works from the IQSC collections.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 816 Apparel Design for Industry****Crosslisted with:** TMFD 416**Prerequisites:** TMFD 212, 216 and 403.**Notes:** Creative experience.**Description:** Designing apparel, computer-aided design, pattern making, and line development for specific markets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** SDO**Prerequisite for:** TMFD 823**TMFD 817 Textiles and Dress: A Cultural Perspective****Prerequisites:** 6 hours of history or art history; TMFD 206**Description:** Textiles and dress as an expression of the life, arts and material culture of Europe, Asia, the Middle East, Africa and the Americas. Literature and theoretical approaches.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 818 Quilts, History, Culture****Prerequisites:** Permission.**Description:** Influence of social, political, artistic and technological developments on quiltmaking traditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 822 International Textile and Apparel Sourcing****Crosslisted with:** TMFD 422**Prerequisites:** Senior Standing and TMFD 313**Description:** Comprehensive study of issues involved in global sourcing, including the scope, trends, and sustainability of current practices. An analysis of cultural, political, ethical, and economic perspectives related to global sourcing, production, trade and distribution of textiles and apparel products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 823 Advanced Design in Mixed Media****Prerequisites:** TMFD 212, 216, 312, and 803 or 816**Description:** Creative experience in designing textiles and apparel as three-dimensional art forms with emphasis on conceptualization, expression, media, techniques, lighting, space, and movement as influential factors combined with exhibition experience. Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** SDO**TMFD 824 Rendering and Production of Textiles and/or Apparel****Prerequisites:** Permission of instructor**Description:** Studio experience in working with a variety of media, including digital, to render and produce textiles and/or apparel; and Portfolio development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** SDO**TMFD 825 Advanced Design for Printed Textiles****Crosslisted with:** TMFD 425**Prerequisites:** TMFD 144, TMFD 145, and TMFD 146.**Description:** Digital and other media for printed textiles. Design development, professional practices, and expressive and communicative concepts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**TMFD 828 Coloration****Crosslisted with:** TMFD 428**Prerequisites:** 4 hrs CHEM and TMFD 206.**Description:** Application classes of dyes. Physical and chemical properties of dyes within each class, methods of dye-fiber association, fastness properties of dyes, and recommended application procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 830 Textiles****Description:** Fibers, yarns, fabric construction, and finishes as they affect use and care.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** TMFD 809; TMFD 876, ANTH 883

TMFD 851 Consumer Behavior

Prerequisites: Admission to the Merchandising Specialization Masters Degree program or permission

Description: Evaluation of psychological, sociological, and cultural theories of consumers' behavior through the examination of factors influencing consumers' decision-making process.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 852 Professional Advancement

Prerequisites: Admission to the Merchandising Specialization Masters Degree program

Description: Analysis of leadership and how it affects organizational culture and change through a prism of past and current experiences. Various leadership styles will be examined and a personal leadership philosophy will be developed for professional advancement in merchandising.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 854 Promotional Strategies in Merchandising

Prerequisites: Admission to the Merchandising Specialization Masters Degree program or permission

Description: Examination of integrated marketing communications (i.e., promotional strategies and techniques) while fostering cultural and global awareness, social responsibility and ethical decisions-making in the field of promotion.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 855 Retail Theory and Current Practice

Prerequisites: Admission to the Merchandising Specialization Masters Degree program. Retail Management course

Description: Theoretical and applied analysis of merchandising strategies; assessment of internal and external environmental forces impacting strategic decisions by retail firms; synthesis of past and present trends in order to forecast probable future patterns.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 861 Historical and Contemporary Issues in Trade

Prerequisites: Admission to the Merchandising Specialization Masters Degree program or permission

Description: The examination of fiber, textile, and apparel industries in a global context. Specifically, a look at the historical development of the global and U.S. textile and apparel industries and how the global environment (economic, political, and social systems) affects the textile/apparel production and trade.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 862 International Retail Expansion

Prerequisites: Admission to the Merchandising Specialization Masters Degree program

Description: Gain a comprehensive understanding of the scope, trends, practices and issues in international retail and merchandise management. Comprehend the process of global sourcing and supply chain management. The global retail system and the way goods are distributed to consumers in various countries will also be analyzed.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

TMFD 863 Retail Analytics

Description: Utilizing quantitative data from the merchandising industry to support managerial decision making: specifically, how to format and analyze typical consumer data. Applying analytical approaches to problem solving using Microsoft Excel including: Formulas, Functions, Solver, and Pivot Tables. Decision making and analytical skills will be improved while providing new perspectives and approaches to apply quantitative techniques and methods to solve real-world business problems. Learning to summarize and present quantitative information designed for industry stakeholders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 864 Financial Merchandising Implications

Prerequisites: Admission to the Merchandising Specialization Masters Degree program

Description: The advanced study of financial trends in the merchandising industries; implications related to sole proprietors, partnerships, franchises, S corporations, and C corporations. Focus will be on the financial implications of recent advances in the field that assist graduate students as they embark on careers in academia and/or the merchandising industries.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 865 Strategic Planning

Prerequisites: Admission to the Merchandising Specialization Masters Degree program

Notes: This is a capstone course.

Description: Examination of the executive planning process utilized to develop successful corporate strategies; emphasis on the importance of a market orientation for building customer value and sustaining a competitive advantage.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 866 Product Design, Development & Evaluation

Description: Advanced study of issues and management strategies necessary to design and produce a competitively priced product. Examination of the role of globalization and rapidly changing technology on the development of a successful product.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SUMMER

TMFD 870 Current Issues in Textiles, Fashion and Design

Prerequisites: 9 hrs textiles, merchandising and fashion design and permission

Description: Significant issues in textiles, clothing, and fashion design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 870A Current Issues in Textiles, Fashion and Design: Textiles

Prerequisites: 9 hrs textiles, merchandising and fashion design and permission

Description: Significant issues in textiles, clothing, and fashion design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 870B Current Issues in Textiles, Fashion and Design: Fashion

Prerequisites: 9 hrs textiles, merchandising and fashion design and permission

Description: Significant issues in textiles, clothing, and fashion design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 870D Current Issues in Textiles, Fashion and Design: Design

Prerequisites: 9 hrs textiles, merchandising and fashion design and permission

Description: Significant issues in textiles, clothing, and fashion design.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 871 Experimental Apparel Design

Crosslisted with: TMFD 471

Prerequisites: TMFD 216 and TMFD 403/803.

Description: Advanced work in the creation of apparel as visual communication. Design conceptualization with experimentation in media, structure, technique, and presentation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: SDO

TMFD 873 Design Perspectives and Issues

Description: Contemporary issues in design with creative and/or curatorial work.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 874 Theory Development

Description: Emergence and synthesis of theory, current theoretical development, conceptual structures, theory construction as a framework for research and evaluation of scholarly publications.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

TMFD 875 Research Methods

Crosslisted with: HUMS 875

Description: Research methods that addresses practical and theoretical issues involved in designing, conducting, and evaluating research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 876 Material Culture Research Methods

Crosslisted with: ANTH 883

Prerequisites: TMFD 830; TMFD 807 or 808; or permission.

Description: Research methods for material culture study applied to textiles and dress. Methodologies for artifact study and skills. Fiber microscopy as a tool for artifact analysis. Conceptual development, application and evaluation of a model for artifact study.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: FALL

TMFD 877 Gender and Material Culture

Crosslisted with: TMFD 477, WMNS 477, WMNS 877, ANTH 467, ANTH 867

Prerequisites: Junior Standing; 3 hours in any of the following areas: ANTH, SOCI, HIST, AHIS, TMFD or WMNS.

Description: In depth analysis of the relationship between material culture and gender roles, categories, and performances. Engages with theoretical frameworks for material culture and gender, as well as topics such as the body, clothing, the built environment, technology and media.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 890 Workshop/Seminar

Prerequisites: Permission.

Notes: Presented by department faculty and visiting artists, scholars and scientists.

Description: Opportunity to analyze and evaluate techniques, develop skills, or study topics of special interest.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: IND

TMFD 890A Workshop/Seminar - Textiles**Crosslisted with:** TMFD 490A**Description:** Workshops on a variety of topics by department faculty and visiting artists, scholars and scientists. Opportunity to analyze and evaluate techniques, develop skills, or study topics of special interest.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 890B Workshop/Seminar - Fashion****Crosslisted with:** TMFD 490B**Description:** Workshops on a variety of topics by department faculty and visiting artists, scholars and scientists. Opportunity to analyze and evaluate techniques, develop skills, or study topics of special interest.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 890D Workshop/Seminar - Design****Crosslisted with:** TMFD 490D**Description:** Workshops on a variety of topics by department faculty and visiting artists, scholars and scientists. Opportunity to analyze and evaluate techniques, develop skills, or study topics of special interest.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 891 Special Topics in Human Sciences****Crosslisted with:** HUMS 891, NUTR 891, SLPA 891, TEAC 891, CYAF 891**Description:** Aspects of human sciences not covered elsewhere in the curriculum.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**TMFD 892 Professional Study Tour-International or Domestic****Crosslisted with:** TMFD 492**Prerequisites:** 12 hrs textiles, merchandising and fashion design or permission.**Description:** The textile and apparel industry. Visits to museums, showrooms, manufacturers, retail establishments in major domestic and/or foreign markets such as: New York City, Paris, London, Milan, Prague, Shanghai, Seoul.**Credit Hours:** 2-4**Min credits per semester:** 2**Max credits per semester:** 4**Max credits per degree:** 4**Format:** FLD**TMFD 893 Domestic Study Tour****Crosslisted with:** TMFD 493**Prerequisites:** 12 hrs. textiles, merchandising and fashion design**Notes:** The credit hours for this course will be determined by the length of the study tour. Tours of 3-4 days will be for 1 credit and 5-8 will be for 2 credits. Students may repeat this course for credit.**Description:** The apparel, accessories and soft goods marketplaces and manufacturing throughout the U.S. provide excellent arenas for learning. Short domestic study tours including but not limited to such centers of soft good commerce as Las Vegas, Minneapolis/St. Paul, Chicago, Dallas/Ft. Worth and other regional locations.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 4**Format:** FLD**TMFD 896 Independent Study****Crosslisted with:** TMFD 496**Prerequisites:** 12 hrs in textiles, merchandising and fashion design and permission.**Description:** Individual projects in research, literature review, or creative production.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**TMFD 896A Independent Study - Textiles****Crosslisted with:** TMFD 496A**Description:** Individual projects in research, literature review, or creative production.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**TMFD 896B Independent Study - Fashion****Crosslisted with:** TMFD 496B**Description:** Individual projects in research, literature review, or creative production.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND**TMFD 896D Independent Study - Design****Crosslisted with:** TMFD 496D**Description:** Individual projects in research, literature review, or creative production.**Credit Hours:** 1-5**Min credits per semester:** 1**Max credits per semester:** 5**Max credits per degree:** 5**Format:** IND

TMFD 899 Masters Thesis

Prerequisites: Admission to masters degree program and permission of major adviser

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Format: IND

TMFD 905 Advanced Problems

Prerequisites: Permission of chair

Description: Reading, discussions, and reports dealing with the economic, sociological, historical, technical, and aesthetic phases of textiles and clothing.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Format: LEC

TMFD 905A Advanced Problems: Textiles

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TMFD 905B Advanced Problems: Fashion

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TMFD 905D Advanced Problems: Design

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

TMFD 907 Textiles and Apparel Economics

Prerequisites: TMFD 813 plus 9 hrs textiles, merchandising and fashion design, 6 hrs economics (undergraduate hrs)

Description: Current status of the domestic textile and apparel complex; current theories of textile consumption and demand within the international market; factors influencing textile and apparel production, distribution, and expenditures; the role of international trade and its influence on the domestic textile and apparel industry and foreign policy.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 910 Appearance and Space as Nonverbal Communication

Prerequisites: TMFD 810, or permission

Description: Appearance and space as systems of nonverbal communication with emphasis on their relationship to the development of the self and the micro and macro processes of life.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 913 Theory and Issues in Merchandising

Prerequisites: TMFD 813 or permission

Description: Common theoretical frameworks found in the textile/apparel/interior merchandising and marketing literature, plus issues which impact the textiles and apparel industry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TMFD 920 Teaching Practicum

Crosslisted with: CYAF 920, NUTR 920

Prerequisites: CYAF 918

Description: Supervised classroom experiences designed to develop competencies in teaching at the college level.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Format: FLD

TMFD 978 Seminar in Textile History

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Format: LEC

TMFD 986 Seminar in Textiles, Clothing, and Design

Prerequisites: Permission

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

TMFD 995 Doctoral Seminar

Prerequisites: Permission

Description: Intended primarily for doctoral students, although non-doctoral graduate students may be admitted with permission. Immersion in outcome-based scholarly activities with a faculty mentor. Develop, execute and report on one or more projects addressing the interaction between research and practice, individually or in small groups.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 18

Format: IND

TMFD 996 Research Other Than Thesis

Prerequisites: Permission

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Format: IND

TMFD 997 Internship

Prerequisites: 9 hrs textiles, clothing and design graduate credit
Description: Supervised independent professional experience under direction of a practicing professional within the textile and apparel industry, government agencies, museums and/or businesses.
Credit Hours: 1-9
Min credits per semester: 1
Max credits per semester: 9
Max credits per degree: 9
Format: FLD

TMFD 998 Special Topics in Human Sciences

Crosslisted with: CYAF 998, NUTR 998
Prerequisites: Permission
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Format: IND

TMFD 999 Doctoral Dissertation

Prerequisites: Admission to doctoral degree program and permission of supervisory committee chair
Credit Hours: 1-24
Min credits per semester: 1
Max credits per semester: 24
Max credits per degree: 99
Format: IND

Theatre Arts (THEA)

THEA 802 Advanced Stage Movement

Crosslisted with: THEA 402
Prerequisites: THEA 224, 256, or equivalent and permission
Description: Actor movement training intended for the graduate and advanced undergraduate. Focus on the process of building a physical characterization, tumbling, kinesthetic awareness, movement improvisation, period styles, court dancing, mask, Commedia dell'Arte, and stage combat
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 9
Format: LEC

THEA 803 Advanced Voice Techniques

Crosslisted with: THEA 403
Prerequisites: THEA 253, THEA 254, or equivalent and permission.
Description: Introduces actors to techniques ranging from commercial voice-over techniques, dialect mastery, and singing, to specialized voice/speech techniques for stage, screen, and new media.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 9
Format: LEC
Prerequisite for: THEA 408

THEA 806 Costume Crafts

Crosslisted with: THEA 406
Description: The creation of various costume accessories, ornaments and hand properties categorized by the profession as costume crafts.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: SDO

THEA 807 Auditioning

Crosslisted with: THEA 407
Prerequisites: THEA 114, 115, 223, 224 and permission.
Description: Auditioning process, including resumes, interviews, preparation of pieces (forms, styles, and genres), cold readings, songs, etc.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

THEA 808 Advanced Projects in Acting and/or Directing

Prerequisites: (Acting) THEA 112G or 115, 114, 204, 401/801 or equivalent and permission; (Directing) THEA 303, 401/801, 403/803, 410/810, 412/812, 418/818, and permission.
Description: Selected performance in acting and directing in University Theatre, Experimental Theatre, and Laboratory Theatre.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 12
Format: IND

THEA 809 Advanced Projects in Technical Theatre

Crosslisted with: THEA 409
Prerequisites: THEA 410/810, THEA 412/812, THEA 418/818 or equivalent and permission.
Description: Projects in scene design, costume design, lighting design, sound design, or technical direction. Planning and execution of designs for actual production.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 9
Format: IND

THEA 810 Stage Lighting I

Crosslisted with: THEA 410
Prerequisites: 12 hrs theatre arts, including THEA 201 and 202.
Description: Theory and practice of stage lighting. Instruments and control systems employed in lighting the stage. Color in light, its effect upon costume, makeup, and settings. Planning of light plots.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: THEA 408

THEA 811 Stage Lighting II

Crosslisted with: THEA 411
Prerequisites: THEA 410/810 or equivalent.
Description: Intensive work in designing lighting for theatre, dance, musicals, and opera.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

THEA 812 Scene Design I**Crosslisted with:** THEA 412**Prerequisites:** 12 hrs theatre arts including THEA 201 and 202**Description:** Theory and practice of scene design. Application of the principles of design to stage settings. Development of the scene design for a play through sketches, color plates, models, and drawings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** THEA 408**THEA 813 Scene Design II****Crosslisted with:** THEA 413**Prerequisites:** 12 hrs theatre arts, including THEA 201 and 202 and 412/812.**Description:** Theory and practice of scene design. Rendering techniques, period research, and multi-set productions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 814 Stage Lighting III****Crosslisted with:** THEA 414**Prerequisites:** THEA 411/811 or equivalent.**Description:** Advanced lighting design through the rendering of light story boards.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 815 Production Design for Film and Television****Crosslisted with:** THEA 415**Prerequisites:** THEA 413/813 or THEA 489/889.**Description:** Theory and practice of production design for the camera. Research, design techniques, tools, and aspects specific to film and television.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 816 Computer Aided Design (CAD) for the Theatre****Crosslisted with:** THEA 416**Prerequisites:** 12 hrs theatre arts, including THEA 201, and permission.**Description:** Computer Aided Design (CAD) as it applies to scenic, costume, and lighting design. Emphasis on two-dimensional drafting, three-dimensional modeling, and computer graphics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 818 Costume Design I****Crosslisted with:** THEA 418**Prerequisites:** 12 hrs theatre arts, including THEA 201 and 202.**Description:** Theory and practice of stage costume designs. Principles of design as they apply to theatrical costuming. Development of costume designs for the characters in a play through sketches, drawings, and color plates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** THEA 408**THEA 819 Costume Design II****Crosslisted with:** THEA 419**Prerequisites:** THEA 418/818.**Description:** In-depth costume design in the areas of design conception and techniques of design communication. Application of principles learned in Costume Design I.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 820 Problems in Technical Production****Crosslisted with:** THEA 420**Prerequisites:** THEA 201, THEA 410/810, THEA 412/812, or equivalent and permission.**Description:** In-depth theoretical and practical application of organization, materials, and techniques necessary for the planning, execution, maintenance, and use of stage scenery, and the proper and safe use and maintenance of the stage and shop facilities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 821 Drafting for the Theatre****Crosslisted with:** THEA 421**Description:** Advanced techniques and practice in technical drafting as applied to theatrical scenic construction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 822 Theatre Architecture****Crosslisted with:** THEA 422**Description:** Practice in planning of a theatre facility, including program writing, working with consultants and architects, equipment specification, space allocation, codes and regulations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 823 Rendering for the Theatre****Crosslisted with:** THEA 423**Description:** Techniques and practice of rendering for scene and costume design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

THEA 826 Lighting for Film**Crosslisted with:** THEA 426**Prerequisites:** THEA 411/811 or THEA 489/889**Description:** Advanced application of film lighting concepts and techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 827 The American Theatre I****Crosslisted with:** THEA 427**Prerequisites:** 12 hrs theatre arts, including THEA 112G, 335 and 336 or equivalent.**Description:** History and development of the professional American theatre from the beginning to 1900. Includes selected American plays which best characterize the period under consideration.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 828 The American Theatre II****Crosslisted with:** THEA 428**Prerequisites:** 12 hrs theatre arts, including THEA 112G, 335 and 336 or equivalent.**Description:** History and development of the professional American theatre from 1900 to the present day. Includes selected American plays which best characterize the period.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 829 Advanced Stage Lighting Technology****Crosslisted with:** THEA 429**Prerequisites:** THEA 210.**Description:** Strengthen design aesthetic and understanding of modern technology that is commonly seen in the theatre through hands-on exploration of lighting consoles, automated and LED fixtures that will sharpen design skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL**THEA 830 Master Electrician****Crosslisted with:** THEA 430**Prerequisites:** THEA 210.**Description:** Prepare to be a master electrician for live performances by learning basic crew management, principles of electricity, dimmers and general stage lighting equipment as well as common tools used by those in the trade.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Offered:** FALL/SPR**Groups:** Introductory**THEA 831 Advanced Playwriting****Crosslisted with:** THEA 431**Prerequisites:** 12 hrs theatre arts, including THEA 112G or 115, 331 or equivalent, and permission.**Description:** Practice leading to the composition of a three-act play or equivalent long play.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Format:** LEC**THEA 832 Scene Painting****Crosslisted with:** THEA 432**Prerequisites:** 12 hrs theatre arts including THEA 201, or permission.**Description:** Techniques and practice of scene painting for theatre, film, and television. Texture simulation, faux finishes, and realistic drop painting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 833 Advanced Costume Construction****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**THEA 835 Period Patterning****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Format:** SDO**THEA 836 Costume Rendering****Description:** Practice in using various media and plate design; rendering techniques and costume plate experimentation to achieve variety in the portfolio, reflecting the mood and texture of each theatrical work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**THEA 837 Costume Design III****Description:** Advanced costume design techniques in specific types of performance arts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** SDO**THEA 838 Film: Directing****Crosslisted with:** THEA 438**Prerequisites:** THEA 489**Description:** Develop the skills required to successfully direct a film.

Critically analyze a script; shape an actor's performance and balance the technical demands of each scene.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

THEA 840 Continental Drama**Crosslisted with:** THEA 440**Prerequisites:** Junior standing or permission.**Description:** Most frequently produced plays 1652-1989 on European stages (excluding England). Structural aspects and reasons for the play's popularity among performers and audiences.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 845 Dramatic Theory and Practice****Prerequisites:** Permission of Instructor**Description:** Significant questions in dramatic theory and practice of theatre and film production, beginning with Aristotle and continuing to film theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 850 Sound Design I****Crosslisted with:** THEA 450**Prerequisites:** THEA 201 or permission**Description:** Theory and practice of sound design for live theatre. Extensive work with recording, mixing, effects, and playback devices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 851 Sound Design II****Crosslisted with:** THEA 451**Prerequisites:** THEA 450/850 or permission**Description:** Advanced work with recording, editing, and playback devices. Training in digital editing using the ProTools LE platform. Planning and execution of full-length, realized, sound designs for departmental mainstage productions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 854 Sound for Film****Crosslisted with:** THEA 454**Prerequisites:** THEA 489/889 or THEA 451/851.**Description:** Advanced application of studio and field recording techniques and Digital Audio Workstation (DAW) editing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 855 Musical Theatre Techniques****Crosslisted with:** THEA 455, MUOP 455, MUOP 855**Description:** Advanced training in the integration of acting, movement, and singing skills for the performance of musical theatre. Training in artistic decision making that generates a character within a musical. Focus on a discipline of preparation and the resulting practice of performance; practical experiences with solos, duets, and ensembles from American Musical Theatre Repertoire.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Opera/Music Theatre Performanc**THEA 857 Stage Rigging I****Crosslisted with:** THEA 457**Prerequisites:** THEA 201 or permission**Description:** Theory and practice of rigging for live theatre. Extensive work with fly systems, rope systems, and standard rigging hardware.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 860 Script Analysis****Prerequisites:** Permission.**Description:** Analysis of selected plays from ancient Greeks to postmodernism.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 863 Director/Designer Communication****Prerequisites:** Undergraduate major in theatre**Description:** Projects, planning, and execution of various forms and styles involving the communication process between director and designer.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 870 Introduction to Pedagogy****Description:** Introduces the graduate student to contemporary university level teaching theories and their classroom applications.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Format:** LEC**THEA 880 Technological Innovations in Film Production****Crosslisted with:** THEA 480**Prerequisites:** Senior standing and 3.0 GPA.**Description:** History of technological innovation in film. Sound, film format, color systems, lenses and lighting that have enhanced the finished product in the film industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

THEA 881 Screenwriting: The Short Script**Crosslisted with:** THEA 481**Prerequisites:** BRDC 370 or ENGL 252 or 254 or 259A or THEA 331 or permission.**Description:** Character development, story structure, and problem solving. Writing for the short film.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** THEA 486, THEA 886**THEA 882 Film Production I****Crosslisted with:** THEA 482**Prerequisites:** BRDC 269; THEA 114, 201 and 202; BRDC 474/874 or ENGL 252 or 254 or 259A or THEA 331 or permission.**Description:** Film grammar and non-sync film production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 884 Advanced Projects in Film Production and/or New Media****Crosslisted with:** THEA 484**Prerequisites:** THEA 489/889.**Description:** Projects in screenwriting, film production, digital animation, and new media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 885 Post Production for Film and New Media****Crosslisted with:** THEA 485**Prerequisites:** THEA 489/889.**Description:** Advanced studio software and techniques.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 886 Film: Producing****Crosslisted with:** THEA 486**Prerequisites:** THEA 481/881 and THEA 489/889**Description:** The budgeting, organizational, managerial and supervisory skills required by a creative film producer - from financing to distribution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**THEA 887 Digital Motion Graphics****Crosslisted with:** THEA 487**Prerequisites:** THEA 489 or by permission.**Description:** Creating moving text and images using compositing and animation software. Introduction to basic 3D animation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** THEA 473; THEA 474**THEA 889 Film Production II****Crosslisted with:** THEA 489**Prerequisites:** THEA 481/881, THEA 482/882, and permission.**Description:** Advanced film production techniques including sync-sound, lighting, lab post-production and film business. Small group production of Cinema Verite's Experimental and Narrative short films.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** THEA 479; THEA 486, THEA 886; THEA 488; THEA 496; THEA 838, THEA 438**THEA 891 Advanced Projects in Directing and/or Theatre Management and/or Stage Management****Crosslisted with:** THEA 491**Prerequisites:** THEA 202; THEA 300 or 301; and permission.**Description:** Selected projects in directing, theatre management, or stage management in University Theatre or Theatrix.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Format:** IND**THEA 894 Internship in Theatre or Film****Crosslisted with:** THEA 494**Prerequisites:** Permission**Description:** Structured internships with professional organizations or individuals outside the University of Nebraska-Lincoln campus or with Nebraska Educational Telecommunications.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Format:** FLD**THEA 898 Special Topics in Theatre Arts****Prerequisites:** Permission.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Format:** LEC**THEA 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**THEA 940 Seminar in Theatre Design****Prerequisites:** Undergraduate major in theatre arts**Notes:** Prereq or parallel: THEA 810, 812, 818 and 932.**Description:** Problems and theories of scenery, costume, and lighting design for ballet, opera, musicals, and legitimate plays. Discussion of student projects and designed full-scale productions.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Format:** LEC

THEA 956 Seminar in Theatre History

Prerequisites: Undergraduate major in theatre arts including 9 hrs theatre history and evolution of dramatic theory

Description: Specialized topics in theatre history.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Format: LEC

Turfgrass and Landscape Management (TLMT)

TLMT 813 Turfgrass and Landscape Weed Management

Crosslisted with: AGRO 813, HORT 813

Description: Fundamental terminology associated with turfgrass and landscape weed management. Weed identification and the cultural practices and herbicide strategies to limit weed invasion and persistence.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

TLMT 814 Turfgrass Disease Management

Crosslisted with: AGRO 414, AGRO 814, HORT 414, HORT 814, PLPT 414, PLPT 814, TLMT 414

Prerequisites: BIOS/PLPT 369 or one semester of introductory plant pathology.

Description: Pathogens, epidemiology, and control of diseases specific to turfgrass.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

TLMT 827 Turfgrass Systems Management

Crosslisted with: AGRO 427, HORT 427, TLMT 427, AGRO 827, HORT 827

Prerequisites: TLMT 227 and TLMT 327.

Description: Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

TLMT 840 Turfgrass and Landscape Integrated Pest Management

Crosslisted with: HORT 840

Description: Principles of turfgrass and landscape plant pest management and tools to implement Integrated Pest Management (IPM) approaches. Creating healthy landscapes and effectiveness of IPM alternatives.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

TLMT 880 Modified Rootzones

Crosslisted with: AGRO 480, HORT 480, TLMT 480, AGRO 880, HORT 880

Notes: Offered as a five-week course.

Description: Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Veterinary and Biomedical Sciences (VBMS)

VBMS 805 Introduction to Mechanisms of Disease

Prerequisites: ASCI 240 or equivalent, BIOC/BIOS/CHEM 831, VBMS/BIOS 841

Description: Offered odd-numbered calendar years. Designed for students of biological, animal, and veterinary sciences. Introduction to general pathology emphasizing etiology, pathogenesis, morphologic features, and fundamental alterations associated with the fundamental changes of disease.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: VBMS 975

VBMS 808 Functional Histology

Crosslisted with: BIOS 408, BIOS 808, VBMS 408

Prerequisites: BIOS 101 and 101L or LIFE 120 and 120L or BIOS 112; BIOS 213 or ASCI 240 or ASCI 340.

Description: Microscopic anatomy of the tissues and organs of major vertebrate species, including humans. Normal cellular arrangements of tissues and organs as related to their macroscopic anatomy and function, with reference to sub-cellular characteristics and biochemical processes. Functional relationships among cells, tissues, organs and organ systems, contributory to organismal well being. General introduction to pathological processes and principles underlying some diseases.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VBMS 811 Introduction to Veterinary Epidemiology

Prerequisites: Permission

Description: Offered summer semester of odd-numbered years.

Introduction to concepts of epidemiology including definition and uses of epidemiology. Casual web theory of causation discussed and compared to the Henle-Koch postulates. Students use sampling methods to define population characteristics, detect disease and test hypotheses. Practical application of confidence, power, and sample size. Use of descriptive epidemiology to discuss population characteristics.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: VBMS 920; VBMS 921; VBMS 925

VBMS 820 Molecular Genetics

Crosslisted with: BIOS 420, BIOS 820, MBIO 420

Prerequisites: BIOS 206 and Senior standing.

Description: Molecular basis of genetics. Gene structure and regulation, transposable elements, chromosome structure, DNA replication, and repair mechanisms and recombination.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BIOS 945; BIOS 964, VBMS 964; FDST 908B

VBMS 824 Basic Molecular Infectious Diseases

Crosslisted with: VBMS 424

Prerequisites: BIOS 312.

Notes: Offered spring semester of odd-numbered calendar years.

Description: Introduction to the molecular, genetic and cellular aspects of microbial pathogenesis in humans and animals. Critical reviews of original scientific literature and development of manuscript and proposal writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Offered: SPRING

VBMS 830 Veterinary Anatomy I

Crosslisted with: VMED 630

Prerequisites: For VBMS 830: none. For VMED 630: First year standing in the Professional Program in Veterinary Medicine

Description: Comparative and topographic anatomy of the dog, cat, and pig.

Credit Hours: 6

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Prerequisite for: VMED 631, VBMS 831

VBMS 831 Anatomy II

Crosslisted with: VMED 631

Prerequisites: VBMS 830

Description: Gross anatomy of domestic ruminants, horses, and birds. An advanced course in detailed gross anatomy incorporating intensive dissection laboratory sessions and classroom lectures.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VBMS 840 Microbial Physiology

Crosslisted with: BIOS 440, BIOS 840, MBIO 440

Prerequisites: BIOS 312; BIOS 313 or BIOS 314.

Description: Molecular approaches to the study of prokaryotic cell structure and physiology, including growth, cell division, metabolism, and alternative microbial life styles.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 841 Pathogenic Microbiology

Crosslisted with: BIOS 441, BIOS 841, VBMS 441, VBMS 441H

Prerequisites: BIOS 312

Description: Fundamental principles involved in host-microorganism interrelationships. Identification of pathogens, isolation, propagation, mode of transmission, pathogenicity, symptoms, treatment, prevention of disease, epidemiology, and methods of control.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: VBMS 805; VBMS 949

VBMS 841L Pathogenic Microbiology Laboratory

Crosslisted with: VBMS 441L

Prerequisites: BIOS 312.

Description: Application of diagnostic microbiological techniques to the isolation, propagation and identification of common pathogens of human beings and animals. Case studies used, in the laboratory setting, to explore and test fundamentals of transmission, epidemiology and pathogenesis of selected infectious agents and to relate these to disease signs, treatments and methods of control.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LAB

VBMS 842 Endocrinology

Crosslisted with: ASCI 442, ASCI 842, BIOS 442, BIOS 842

Prerequisites: A course in vertebrate physiology and/or biochemistry.

Description: Mammalian endocrine glands from the standpoint of their structure, their physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 843 Immunology

Crosslisted with: BIOS 443, BIOS 843, MBIO 443

Prerequisites: BIOS 206; CHEM 251 or CHEM 255 or CHEM 261.

Description: Fundamental consideration of cellular and humoral mechanisms of immunity, the structure and function of immunoglobulins, antigen-antibody interactions; hypersensitivity; transplantation and tumor immunity; immune and autoimmune disorders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: BIOS 966, VBMS 966; VBMS 852; VBMS 908; VBMS 910; VBMS 948; VBMS 949

VBMS 845 Animal Physiology I**Crosslisted with:** VMED 645, ASCI 845**Prerequisites:** Undergraduate courses in biochemistry, biology and physiology.**Notes:** Primarily for students in animal or biological sciences or veterinary medicine.**Description:** Mammalian physiology and cellular mechanisms. Physiology of the cell, embryology, and neuro-sensory, neuromuscular, endocrine, and reproductive systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**VBMS 846 Animal Physiology II****Crosslisted with:** VMED 646, ASCI 846**Prerequisites:** ASCI/VBMS 845 or BIOS 813**Notes:** ASCI/VBMS 846/BIOS 814/VMED 646 is designed for students in animal or biological sciences or veterinary medicine.**Description:** Mammalian physiology and cellular mechanisms. Physiology of the digestive, cardiovascular, respiratory, and renal systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC**VBMS 847 Interdisciplinary Concepts in Beef Production****Crosslisted with:** ASCI 847**Prerequisites:** Degree in veterinary medicine or animal science, or allied agricultural degree**Notes:** Classroom attendance is required during each of the modules. Between modules distance education technologies (laptop computer, Internet access, a computer operating system with a word processor, spreadsheet, and presentation software, email, etc.) are used and required for discussion and assignments.**Description:** The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC**VBMS 847A Interdisciplinary Concepts in Beef Production I****Crosslisted with:** ASCI 847A**Description:** The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** ASCI 847B, VBMS 847B**VBMS 847B Interdisciplinary Concepts in Beef Production II****Crosslisted with:** ASCI 847B**Prerequisites:** VBMS 847A**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 848 Introduction to Veterinary Biotechnology****Prerequisites:** 12 hours of veterinary and biomedical sciences or DVM degree, or equivalent and permission**Description:** Information and assignments for VBMS 848 exchanged in the classroom and via Internet. Theoretical basis for emerging cellular, molecular and reproductive technologies, and their potential applications and impacts in the practice of food animal veterinary medicine.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**VBMS 852 Molecular Virology and Viral Pathogenesis****Prerequisites:** BIOS 843**Notes:** Offered even-numbered calendar years.**Description:** Introduction to virology with emphasis on molecular biology and pathogenesis. Concepts of virus replication strategies, virus-host interactions and virus pathogenesis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** BIOS 950, VBMS 950; BIOS 966, VBMS 966; VBMS 949**VBMS 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Format:** IND**VBMS 901 Diagnostic Techniques****Description:** Application of the principles of pathology to current problems in the diagnostic laboratory.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** LEC**VBMS 908 T Cell Biology: Repertoire and Effector Functions****Prerequisites:** BIOS 843**Notes:** Offered even-numbered calendar years.**Description:** Analysis of the literature of the cellular and molecular biology of T cell recognition and effector functions. Subject areas: Scientific Methodologies; Antigen Presentation; T Cell Receptor and Coreceptor; Thymic Structure and Self/Nonself Discrimination; T Cell Regulation; Allergy and Autoimmune Diseases; and T-Cell-Mediated Inflammation and Cytokine Network.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 909 Seminar****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Format:** LEC

VBMS 910 Topics in Immunology

Prerequisites: VBMS 843 or BIOS 843

Description: Basics of immunology; critical analysis of reports taken from scientific literature of immunology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 919 Regulation of Eukaryotic Gene Expression

Prerequisites: 1) BIOC 818 or 820; 2) BIOC 832; and 3) BIOC 838 or BIOS 837 or related laboratory experience

Notes: Offered even-numbered calendar years.

Description: Basic mechanisms regulating gene expression in eukaryotes during various physiological states. Emphasis on understanding specific and unique mechanisms in mammalian systems. Techniques used to study gene regulation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 920 Measurement of Animal Disease and Production

Prerequisites: VBMS 811

Notes: Offered odd-numbered calendar years.

Description: Measurements of disease and production, the basic tenants of epidemiology, taught in detail including incidence density, risk rates, morbidity, mortality, cause specific rates, and life tables. Methods and implications of measuring disease at the farm, regional, and national levels. Sampling strategies and the impact of these on the standard error of the estimate. Implications and biases of using retrospective production data versus prospective data. Clinical epidemiology which includes definition of tests in veterinary medicine, individual and herd level sensitivity and specificity, receiver operating characteristics curves, positive and negative predictive values, serial and parallel interpretation of tests, Kappa statistics, and issues of precision, validity, and accuracy.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

Prerequisite for: VBMS 921; VBMS 925

VBMS 921 Analytic Observational Studies in Veterinary Epidemiology

Prerequisites: VBMS 811 and 920

Notes: Offered odd-numbered calendar years.

Description: Design, implementation, and analysis of cross-sectional, cohort, and case-control studies and field trials. Limitations, biases, implications of the results, and current uses of each. Evaluation of these methods as used in the scientific literature. Analyses includes chi-square tests, Cochran Chi-square tests, and epidemiologic measures of strength of association, effect, and total effect. Design, implementation, analysis and interpretation of field trials taught specifically as they relate to the practitioner.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VBMS 925 Critical Reading of the Epidemiology Literature

Prerequisites: VBMS 811 or 920; or permission

Notes: May be repeated for credit.

Description: Analysis of current epidemiology and animal health literature. Critical evaluation of study design, methods of analysis, biases, field applicability, and basis for conclusions.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 4

Format: LEC

VBMS 930 Advanced Food Animal Production Medicine

Prerequisites: Permission

Notes: Offered spring semester of even-numbered calendar years.

Description: Inter-relationships between animal health, disease, and well-being as they relate to the productivity and profitability of food animal production units. Integrates aspects of veterinary medicine, animal science, and agricultural economics. General concepts related to cattle, swine and sheep production systems, followed by specific issues that relate to different species.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VBMS 942 Genetics, Genomics, and Bioinformatics of Prokaryotes

Crosslisted with: BIOS 942

Description: Prokaryotic gene regulation, DNA exchange, DNA recombination and repair, comparative prokaryotic genomics and computer-based methods of analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 944 Immunovirology

Prerequisites: Permission; organic chemistry; biochemistry; immunology and/or concepts in virology and virolopathogenesis

Description: Pathogenic microbiology recommended. Description of virus and immune system interactions, with emphasis on mouse and human models. Mechanism of antigen presentation of viral proteins and relationship to health and disease. Analysis of the hosts immune response to selected viral infections of the major systems: neural, respiratory, gastrointestinal and immune.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 948 Concepts in Experimental Immunology

Prerequisites: BIOS 843

Description: Recent advances in immunological techniques and review of conventional methods.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VBMS 949 Vaccinology**Prerequisites:** VBMS/BIOS 841; BIOS 843, VBMS 843; VBMS/BIOS 852**Description:** Analysis of the theory and mechanisms involved in the development of efficacious vaccines. Microbiological and immunological aspects as well as the manufacturing and regulatory aspects of vaccine development.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**VBMS 950 Medical Molecular Virology****Crosslisted with:** BIOS 950**Prerequisites:** BIOS/CHEM/BIOC 431/831 and 432/832; VBMS 852**Notes:** Offered odd-numbered calendar years.**Description:** Current topics in molecular virology relevant to the natural history and pathogenesis of viral diseases of humans and animals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 951 Advanced Molecular Infectious Diseases****Prerequisites:** BIOC 832 or equivalent; 18 hours of biological, biomedical and/or veterinary sciences, including fundamental microbiology and genetics**Notes:** VBMS 824 and 843 or equivalent recommended. Offered spring semester of even-numbered years.**Description:** Molecular and cellular aspects of microbial pathogenesis. Key literature, synthesis of scientific problems into research proposals.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 964 Signal Transduction****Crosslisted with:** BIOS 964**Prerequisites:** BIOS 820.**Description:** Molecular basis of genetics in eukaryotes. Gene structure and regulation, transposable elements, chromosome structure, DNA replication and repair mechanisms and recombination.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 966 Advanced Viral Pathogenesis****Crosslisted with:** BIOS 966**Prerequisites:** BIOS 843; VBMS 852 or equivalent introductory course in virology or experience**Description:** Advanced analysis on the mechanisms of cell and tissue damage by viruses, the spread of viruses through the body, and the host response.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**VBMS 975 Seminar in Veterinary Histopathology****Prerequisites:** VBMS 805, or equivalent and permission**Notes:** May be repeated for credit.**Description:** Descriptive veterinary histopathology covering diseases of all body systems in animal species including domestic, laboratory, wildlife, birds, fishes, reptiles, and amphibians. Source material is worldwide in scope.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**VBMS 996 Research on Selected Problems in Veterinary Science****Credit Hours:** 2-10**Min credits per semester:** 2**Max credits per semester:** 10**Max credits per degree:** 10**Format:** IND**VBMS 998 Special Topics in Veterinary Science****Prerequisites:** Permission**Description:** The subject will be dependent on student demand and availability of staff. Reviews of specialized subject areas.**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 10**Format:** LEC

Veterinary Medicine (VMED)

VMED 501 Veterinary Medicine Terminology**Prerequisites:** Must be admitted to the UNL-ISU Veterinary Medicine Program**Description:** Overview of medical terminology used by veterinarians.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Format:** LEC**VMED 511 Foundations of Veterinary Medicine****Prerequisites:** Must be admitted to the UNL-ISU Veterinary Medicine Program**Description:** Basic behavior, animal handling and restraint; medical record keeping; physical examination; and clinical cases.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Prerequisite for:** VMED 512**VMED 512 Foundations of Veterinary Medicine II****Prerequisites:** Must be admitted to the UNL-ISU Veterinary Medicine Program. VMED 511.**Description:** Animal welfare issues, clinical cases, animal handling and restraint.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Format:** LEC**Prerequisite for:** VMED 513

VMED 513 Foundations of Veterinary Medicine III

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program. VMED 512.

Description: Ethical issues in veterinary medicine, clinical cases, animal handling and restraint.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: VMED 514

VMED 514 Foundations of Veterinary Medicine IV

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program. VMED 513.

Description: Ethical issues in veterinary medicine, clinical cases, animal handling and restraint.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VMED 521 Cattle Production Systems I

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Notes: Field trips to the Mead Facility will be made as necessary to complete certain objectives. Some field trips may be required on weekends.

Description: Overview of tools and methods veterinarians use to optimize productivity and improve financial success for beef cattle producers, including how to evaluate and monitor production/management strategies and how to integrate the many factors involved in decision making. Specific topics will include late winter feeding, managing cows for breeding, managing replacement heifers, estrus synchronization, artificial insemination, preparing for calving, handling newborn calves, herd genetics, bull selection, vaccines, parasite control, prebreeding health programs, branding, bull management, and marketing strategies.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Prerequisite for: VMED 522

VMED 522 Cattle Production Systems II

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program; Cattle Productions Systems I.

Notes: Field trips to the Mead Facility will be made as necessary to complete certain objectives. Some field trips may be required on weekends.

Description: Overview of tools and methods veterinarians use to optimize productivity and improve financial success for beef cattle producers, including how to evaluate and monitor production/management strategies and how to integrate the many factors involved in decision making. Specific topics will include pre-weaning processing, record analysis, data entry, reproductive management, pregnancy diagnosis, replacement heifer selection, weaning data, pregnancy diagnosis data, replacement heifer data, winter nutrition, and feedlots.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

VMED 531 Introduction to Animal Welfare

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: The objective of this course is to develop knowledge of the fundamental principles of animal welfare, in terms of science, ethics and cultural components.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

VMED 550 Nutritional Biochemistry

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Introduce basic biochemical aspects of metabolism and function of energy, protein, fat, minerals and vitamins in the diet. Determine nutrient requirements of food animals, pets and horses under various physiological states. Understand fate of various nutrients in simple stomached animals, ruminants and cecal fermenters. Discuss clinical nutrition problems specific to each species.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VMED 583 Principles of Surgery I

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: General principles of surgery for and common surgical problems in animals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Prerequisite for: VMED 589

VMED 584 Veterinary Clinical Pathology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Integration of hematology, clinical chemistry and cytology in mechanisms of disease.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 589 Anesthesiology and Small Animal Surgery

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program. VMED 583.

Description: Anesthetic equipment, agents and procedures for domestic animals. General principles of surgery of small/companion animal surgery.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: LEC

VMED 596 Special Topics in Veterinary Medicine

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Aspects of veterinary medicine not covered elsewhere in the curriculum presented as the need arises. Topic varies.

Credit Hours: 3.00

Max credits per semester: 3

Max credits per degree: 6

Format: LEC

VMED 596A Independent Study: Gross Systematic Pathology Lab

Prerequisites: Second year students in the Professional Program of Veterinary Medicine

Description: Evaluation, description and pathogenesis of gross pathologic images of most vertebrate species.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LAB

VMED 630 Veterinary Anatomy I

Crosslisted with: VBMS 830

Prerequisites: First year standing in the Professional Program in Veterinary Medicine

Description: Comparative and topographic anatomy of the dog, cat, and pig.

Credit Hours: 6

Max credits per semester: 6

Max credits per degree: 6

Format: LEC

Prerequisite for: VMED 631, VBMS 831

VMED 631 Anatomy II

Crosslisted with: VBMS 831

Prerequisites: VBMS 830

Description: Gross anatomy of domestic ruminants, horses, and birds. An advanced course in detailed gross anatomy incorporating intensive dissection laboratory sessions and classroom lectures.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 637 Veterinary Neuroanatomy

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Concepts of nervous system functioning, problem identification, and neurologic diseases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VMED 642 Veterinary General, Cellular and Molecular Pathology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: General mechanisms of disease and lesion development in animals at the molecular, cellular, and organ levels. Topics include: introduction to pathology; basic terminology; overview of normal cell biology; cellular and tissue responses to injury; vascular disorders and thrombosis; acute inflammation; chronic inflammation and wound healing; diseases of immunity; neoplasia and tumor biology.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 645 Animal Physiology I

Crosslisted with: ASCI 845, VBMS 845

Prerequisites: First year standing in and admission to VMED.

Notes: Primarily for students in animal or biological sciences or veterinary medicine.

Description: Mammalian physiology and cellular mechanisms. Physiology of the cell, embryology, and neuro-sensory, neuromuscular, endocrine, and reproductive systems.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: FALL

VMED 646 Animal Physiology II

Crosslisted with: ASCI 846, VBMS 846

Prerequisites: First year standing in and admission to VMED.

Notes: ASCI/VBMS 846/BIOS 814/VMED 646 is designed for students in animal or biological sciences or veterinary medicine.

Description: Mammalian physiology and cellular mechanisms. Physiology of the digestive, cardiovascular, respiratory, and renal systems.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

Offered: SPRING

VMED 650 Anatomical Radiology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: The study of normal radiographic anatomy of the dog and cat. Emphasis on patient positioning and proper selection of image modalities based on the anatomic area in question.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

VMED 654 Pharmacology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: General principles; drug disposition; drugs acting on the nervous, cardiovascular, renal, gastrointestinal and endocrine systems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VMED 660 Veterinary Histology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Fundamental eukaryotic cell biology and early development, microscopic structure of basic cell types, tissues and organs of the body, following a system/apparatus approach.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 672 Veterinary Systemic Pathology I

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: The course will study the pathological changes that occur in the body and emphasize selected animal and zoonotic diseases or syndromes which occur with each system.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 673 Veterinary Systemic Pathology II

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program.

Notes: Continuation of VMED 672.

Description: Emphasis on disease process, immunopathology and pathogenesis and mechanisms of disease in domestic animals and select enzootic disease of wildlife and birds.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VMED 676 Veterinary Parasitology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Biology of parasites of major veterinary importance. The understanding required for control of parasitism.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

VMED 680 Veterinary Immunology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Principles and mechanisms underlying the immune system.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Format: LEC

VMED 686 Veterinary Microbiology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Bacteria and fungi of veterinary importance. Mechanisms of disease production and laboratory diagnostic methods.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Format: LEC

VMED 687 Veterinary Virology

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: The unique biological features of viruses in terms of their life cycle and tropism in their hosts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

VMED 688 Veterinary Public Health

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program

Description: Fundamentals of epidemiology, zoonotic diseases, occupational health, food safety, and other public health topics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Water Science (WATS)

WATS 881 Stream and River Ecology

Crosslisted with: WATS 481, BIOS 481, NRES 481

Prerequisites: NRES 222 or equivalent.

Description: Fundamental physical drivers operating in stream and river ecosystems and how those vary in space and time. Major classes of organisms associated with stream ecosystems and their functional roles. Fundamental controls on biotic diversity in stream and river ecosystems and its variance. Major aspects of stream ecosystem function including energy flow and nutrient cycling. Ecosystem services provided by stream and river ecosystems and causes and consequences of human impacts on streams and rivers. Underlying principles of bioassessment and current methods of stream restoration.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Format: LEC

WATS 884 Water Resources Seminar

Crosslisted with: AGRO 484, GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, AGRO 884, GEOG 884, GEOL 884

Description: Seminar on current water resources research and issues in Nebraska and the region.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Format: LEC

Women's and Gender Studies Program (WMNS)

WMNS 801K LGBTQ Drama and Popular Culture

Crosslisted with: ENGL 401K, ENGL 801K, WMNS 401K

Prerequisites: Junior standing.

Description: Overview of lesbian, gay, bisexual, transgender, and queer drama and popular culture.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Format: LEC

Groups: Literary and Cultural Studies

WMNS 802 Sexuality in Nineteenth and Twentieth Century America**Crosslisted with:** HIST 402, HIST 802, WMNS 402**Description:** Sexual practices and ideologies in American history from the 1800's to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**WMNS 810 Gender: An Anthropological Perspective****Crosslisted with:** ANTH 410, ANTH 810, WMNS 410**Prerequisites:** 6 hrs ANTH**Description:** Theoretical approaches to gender. Emphasis is placed on cross-cultural differences in gender socialization of as it pertains to sexual behavior, power within domestic and public spheres, and the impact of gender on individual aspirations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Cultural Anthropology**WMNS 810A Body, Dress and Identity****Crosslisted with:** TMFD 410, TMFD 810, WMNS 410A**Prerequisites:** Senior standing; 3 hrs PSYC or SOCI; TMFD 123.**Description:** Theories and research findings about the social, cultural, and psychological aspects of clothing and appearance in relation to the self and others. Special emphasis will be placed on relationship(s) between the body, dress, and personal and social identities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 814 Women's Literature****Crosslisted with:** ENGL 414, ENGL 814, WMNS 414**Prerequisites:** Junior standing.**Description:** A particular historical or other groups of literature by and about women, seen in their aesthetic and intellectual context.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 814B Modern and Contemporary Women Writers****Crosslisted with:** ENGL 414B, ENGL 814B, WMNS 414B**Prerequisites:** Junior standing.**Description:** Selected women writers from the twentieth and twenty-first century.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Literary and Cultural Studies**WMNS 821 Psychology of Gender****Crosslisted with:** PSYC 421, PSYC 821, WMNS 421**Prerequisites:** 12 hrs PSYC.**Description:** Theory and research on the role of gender in human behavior and attitudes. Diverse theoretical positions on the development of gender and the biological, social, and cultural bases that influence the relationship between gender and a variety of areas of human experience (e.g., intelligence and achievement, emotion, relationships, sexuality, physical fitness, stress, and coping).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 840 Gender and Sexuality in the Ancient World****Crosslisted with:** CLAS 440, CLAS 840, WMNS 440**Description:** Ancient Greek and Roman evidence pertaining to the fields of women's studies, gender studies, and the study of sexuality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 841 Seminar in U.S. Women's and Gender History****Crosslisted with:** HIST 441, HIST 841, WMNS 441**Description:** In-depth, advanced thematic seminar that cultivates historical research and writing skills.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** United States or Canadian Hist**WMNS 845 Gender Economics and Social Provisioning****Crosslisted with:** ECON 445, ECON 845, WMNS 445**Prerequisites:** ECON 211 or ECON 212.**Description:** Introduction to the field of feminist economics. Critiques of economic theory and methodology along with gender and household decision-making, the care economy, international migration, development, globalization, the feminization of labor markets, and macroeconomics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** General Economics and Theory**WMNS 847 Working with Gay, Lesbian, Bisexual and Transgender (GLBT)****Youth in Professional Context****Crosslisted with:** CYAF 847, CYAF 447, WMNS 447**Description:** Contextual considerations and research-informed guidelines for working with Gay, Lesbian, Bisexual, and Transgender (GLBT) youth in professional settings such as education, mental health, medical, and community outreach. The systemic context of GLBT youth, including developmental transitions, unique stressors, peer relationships, familial environments, and ways to help GLBT youth thrive**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

WMNS 859 Women and Gender in African Societies**Crosslisted with:** HIST 459, HIST 859, ETHN 459, WMNS 459**Description:** Explores how the contemporary women's movement has emerged within Africa and its relationship to social change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**WMNS 875A Rhetorical Theory: Rhetoric of Women Writers****Crosslisted with:** ENGL 475A, ENGL 875A, WMNS 475A**Prerequisites:** Junior standing.**Description:** Rhetoric and rhetorical theory of women writers and speakers and its implications for literature, composition, literacy, feminist theory, and women's and gender studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Writing,Rhetoric,Culture**WMNS 876A Gender and Sexuality in Latin America****Crosslisted with:** HIST 476A, ETHN 476A, WMNS 476A, HIST 876A**Prerequisites:** Junior standing.**Description:** Experience of femininity and masculinity compared according to time and place, revealing the intimate connections with nation, modernity, race, and ethnicity.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**Groups:** Lat Am,Asian,Middle East Hist**WMNS 877 Gender and Material Culture****Crosslisted with:** TMTD 477, TMTD 877, WMNS 477, ANTH 467, ANTH 867**Prerequisites:** Junior Standing; 3 hours in any of the following areas: ANTH, SOCI, HIST, AHIS, TMTD or WMNS.**Description:** In depth analysis of the relationship between material culture and gender roles, categories, and performances. Engages with theoretical frameworks for material culture and gender, as well as topics such as the body, clothing, the built environment, technology and media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 885 Feminist Theories, Feminists' Perspectives****Crosslisted with:** WMNS 485**Prerequisites:** WMNS major or minor.**Description:** Introduction to feminist and gender theory. Important theoretical frameworks upon which Women's Studies is based and the implications of these theories in practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 890 Sociology of Gender****Crosslisted with:** SOCI 490, SOCI 890, WMNS 490**Prerequisites:** 9 hours of SOCI, or Senior standing.**Notes:** SOCI 200 is strongly recommended.**Description:** Evaluation and application of scholarly theory and research on gender in societal context. The nature and effects of sex stratification, gendered culture, institutionalized sexism, feminist theory and sociology of knowledge.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 891 Special Topics in Women's and Gender Studies****Description:** Advanced graduate level seminar in Women's and Gender Studies. Topics vary by semester.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 892 Special Topics in Masculinities****Crosslisted with:** WMNS 492**Description:** Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC**WMNS 896 Independent Study in Women's and Gender Studies****Prerequisites:** Permission**Description:** Individual or group study on a topic in Women's and Gender Studies under supervision and evaluation of a Women's and Gender Studies faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** IND**WMNS 897 Internship in Women's and Gender Studies****Prerequisites:** Permission.**Description:** Experiential and service learning designed to deepen understanding of classroom concepts related to study of women and gender in society.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Format:** FLD**WMNS 898 Special Topics in Women's and Gender Studies****Crosslisted with:** WMNS 498**Description:** Topics vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Format:** LEC

WMNS 951 History of Women and Gender**Crosslisted with:** HIST 951**Description:** A comparative approach, offering readings on a central theme from a variety of periods and/or areas. Themes vary.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Format:** LEC

Graduate Studies Policies

This section of the catalog covers policy specific to Graduate Studies.

Any questions about these policies should be directed to Graduate Studies (<http://www.unl.edu/gradstudies/contact>).

It is the responsibility of the student to be familiar with the information in this catalog and on the Graduate Studies website (<http://www.unl.edu/gradstudies>), **and to know and observe all regulations and procedures relating to the program he or she is pursuing.** In no case will a regulation be waived or an exception granted because a student pleads ignorance of, or contends that he or she was not informed of, the regulations or procedures. A student planning to graduate should be familiar with the dates relating to application for graduation and other pertinent deadlines.

The University of Nebraska–Lincoln expressly reserves the right to: add or delete courses from its offerings and to change times or locations; change academic calendars without notice; cancel any course for insufficient registrations; modify, consolidate, or delete any program; and revise or change rules, charges, fees, schedules, courses, requirements for degrees, and any other regulation affecting students including, but not limited to, evaluation standards, whenever considered necessary or desirable.

Graduate Policy Contents

General (p. 490)

- Conduct, Academic Integrity, and Related Policy (p. 490)
- Governance (p. 491)
- Guidelines for Good Practice in Graduate Education (p. 491)

Admission (p. 494)

- Admission Categories (p. 495)
- Admission into Concurrent or Combined Programs (p. 496)
- Admission of Faculty and Staff (p. 496)
- Admission of International Students (p. 497)

Registration, Credit, and Grades (p. 497)

- Registration Requirements (p. 501)
- Tuition and Fees (p. 502)
- Academic Leave of Absence (p. 498)
- Graduate Credit (p. 500)
- Grades and Incompletes (p. 499)

Academic Program Requirements (p. 503)

- Majors, Minors, and More (p. 503)
- Doctoral Degrees (p. 504)
- Master's Degrees (p. 508)
- Educational Specialist Degree (p. 509)
- Certificate Programs (p. 510)
- Probation and Termination (p. 510)

Funding (p. 511)

- Assistantships (p. 511)
- Fellowships (p. 513)
- Loans and Need-Based Funding (p. 513)

Faculty (p. 514)

- Graduate Faculty and Associates (<https://catalog.unl.edu/graduate-professional/graduate/faculty/grad>)
- Graduate Lecturers (<https://catalog.unl.edu/graduate-professional/graduate/faculty/lecturers>)

General

Graduate Studies

In this section:

- Conduct, Academic Integrity, and Related Policy (p. 490) covers the Student Code of Conduct, academic integrity, professional conduct, nondiscrimination, sexual harassment, and student privacy.
- Governance (p. 491) covers the administration of Graduate Studies within UNL and NU.
- Guidelines for Good Practice in Graduate Education (p. 491) provides guidance for faculty and graduate students in the areas of professionalism and ethics, teaching, research, and advising and mentoring.

Conduct, Academic Integrity, and Related Policy

Graduate Studies

Student Code of Conduct

It is the responsibility of each student to understand and adhere to the Student Code of Conduct (<http://stuafs.unl.edu/dos/code>) at all times.

All graduate students are expected to conduct themselves in a professional, respectful manner in all aspects of their graduate education and in all interactions with peers, faculty, staff, and other members of the academic community.

Academic Integrity

Academic integrity is a universal principle in the scholarly community, fundamental to the work graduate students do as researchers, teachers, and students. The Student Code of Conduct (<http://stuafs.unl.edu/dos/code>) outlines the University's expectations regarding academic integrity and an Academic Integrity (<http://www.unl.edu/gradstudies/current/integrity>) page provides additional information. Graduate students are expected to know, understand, and comply with the Code and the university's policies on academic integrity, and act at all times with unwavering integrity.

Academic misconduct, when discovered, has serious consequences. In accordance with the established procedures as described in the Code, students who commit acts of academic dishonesty are subject to disciplinary action. These students are granted due process and the right to appeal any decision. Questions regarding procedures for incidents of academic dishonesty may be directed to the Dean for Graduate Studies.

Professional Conduct

Approved by the UNL Graduate Council, November 2015.

Graduate education must take place in an environment in which free expression, free inquiry, intellectual honesty, and respect for the rights and dignity of others can be expected. Ethical standards of conduct should help ensure, not compromise, these features of the university environment.

All graduate students are expected to maintain the highest standards of academic and professional conduct in all aspects of their training and in all interactions with peers, faculty, staff, and other members of the academic community. Any failure to do so may be grounds for being placed on probation and/or dismissal.

Professional conduct violations consist of behavior that is inconsistent with the ethical standards in the professional roles for which the student is being trained that are not covered by policies governing academic integrity. This may include the student's performance in the role of researcher or scholar, teacher or mentor, supervisor, service provider or colleague. Of particular note in this regard are behaviors that make the workplace hostile for colleagues, supervisors or subordinates (e.g., undergraduate students).

Graduate students are expected to adhere to ethical standards in a variety of work settings (e.g., offices, classrooms, clinics, and laboratories) within the explicit standards set by university policies. Being physically or verbally threatening, disruptive, abusive or hostile can make the workplace so unsafe or unpleasant that others cannot do their work.

Nondiscrimination

In accordance with UNL's Notice of Nondiscrimination (<http://www.unl.edu/equity/notice-nondiscrimination>): UNL is committed to creating a diverse and inclusive work and learning environment free from discrimination and harassment. UNL is dedicated to creating an environment where everyone feels valued, respected and included. UNL does not discriminate on the basis of race, ethnicity, color, national origin, sex (including pregnancy), religion, age, disability, sexual orientation, gender identity, genetic information, veteran's status, marital status, and/or political affiliation in its programs, activities and employment. UNL complies with all local, state and federal laws prohibiting discrimination, including Title IX, which prohibits discrimination on the basis of sex.

The following persons have been designated to handle inquiries regarding non-discrimination policies:

- Title IX or Discrimination Inquiries: Institutional Equity and Compliance (<http://www.unl.edu/equity>)
- Disability or Discrimination Inquiries: Christy Horn (http://webapp.nebraska.edu/4in1/show_info.aspx?i=16558310), ADA/504 Compliance Officer

Sexual Harassment

The University of Nebraska-Lincoln reaffirms that all women and men – administrators, faculty, staff, and students – are to be treated fairly and equally with dignity and respect. Any form of sexual harassment is prohibited.

Sexual harassment is unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of sexual nature when:

- submission to such conduct is made either explicitly or implicitly a term of condition of an individual's employment or academic standing;
- submission to, or rejection of, such conduct by an individual is used as the basis for employment decisions or academic decisions affecting such individual, or
- such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working/academic environment.

Sexual harassment will not be condoned during the work or school day, nor will acts of sexual harassment be permitted outside the work or school environment if such acts affect the normal work environment or student/teacher relationship. UNL provides grievance procedures for violations of this policy. For further information, contact Institutional Equity and Compliance (<http://www.unl.edu/equity>).

Appropriate corrective action will be taken in those instances where the foregoing policies have been violated. Any student or employee who is found to have violated any of the aforementioned policies will be subject to disciplinary action.

Student Privacy

Overseen by the Office of the University Registrar, directory information will be available to the public upon request and may be included in student directories published electronically and/or in hard copy. Students have the right to have directory information withheld from the public. See Directory Information (<http://registrar.unl.edu/directory-information>) for details on which pieces of data are included and how to manage your privacy settings.

Beyond public directory information, the Family Educational Rights and Privacy Act (FERPA) (<http://ferpa.unl.edu>) governs the release of student information.

Governance

Graduate Studies

Graduate studies at UNL are organized and conducted according to the rules and bylaws of the Graduate College of the University of Nebraska. The **UNL Dean for Graduate Studies** is responsible for coordinating and administering graduate-level programs and policies at the University of Nebraska-Lincoln. This Dean also maintains a close liaison relationship with the **Executive Dean of the Graduate College of the University of Nebraska**.

The governance of graduate programs that are principally lodged at UNL is by and through the graduate program committees and the **UNL Graduate Council**, in accordance with the policies and regulations of the University-wide Graduate College. The UNL Graduate Council serves as an advisory body to the Dean for Graduate Studies. The Council is composed of eight Graduate Faculty and two graduate students from the University of Nebraska-Lincoln.

Guidelines for Good Practice in Graduate Education

Graduate Studies

Intro

For Faculty and Graduate Students

Graduate programs help to advance human knowledge, educate professionals, and resolve problems to address societal needs. Graduate faculty and graduate students have a joint responsibility to accomplish these goals. Each graduate student should develop an understanding of and capacity for scholarship, independent judgment, academic rigor, and intellectual honesty. Faculty and students must work together to create an atmosphere that ensures freedom of inquiry, fosters mutual respect, and demonstrates professional integrity.

Good practice in graduate education centers on responsible interactions between graduate students and graduate faculty, supported by college and department staff. The following guidelines are based on the collective experience and wisdom of the major research universities. These guidelines are intended to be constructive and instructive to faculty and graduate students; as such, they do not constitute statements of institutional policy or requirements.

Each category below provides information for students and faculty members on their individual roles and responsibilities.

Professionalism and Ethics

High quality graduate education depends upon the professional and ethical conduct of the participants. Faculty members and graduate students have complementary responsibilities in the maintenance of academic standards and the creation of high quality graduate programs. Excellence in graduate education is achieved when both faculty and students are highly motivated, possess the academic and professional backgrounds necessary to perform at the highest level, and are sincere in their desire to see each other succeed.

Graduate Student Role

- Take primary responsibility to inform themselves of the specific policies and procedures governing their graduate studies (p. 490) at the University of Nebraska-Lincoln.
- Interact with faculty, staff and other students in a mature, professional, and civil manner in accordance with University policies.
- Conduct the whole of one's academic career with unwavering integrity.
- Talk with a trusted faculty member if there are concerns about integrity and ethics.
- Work with diverse faculty and peers regardless of their race, gender, religion, sexual orientation, or national origin.
- Exercise the highest integrity in taking examinations and in collecting, analyzing, and presenting research data.
- Participate in university, departmental, or program governance as a component of professional development.
- Participate in discipline-based activities, such as seminars and conferences, as a component of professional development.
- Manage time effectively for maximum professional development as well as personal health and well being, balancing competing demands such as being a student, a graduate assistant, a parent, a spouse, a caregiver, etc.
- Recognize that faculty and staff have many other professional responsibilities in addition to graduate education.

Faculty Role

- Inform themselves of the specific policies and procedures governing graduate studies (p. 490) at the University of Nebraska-Lincoln.
- Create an environment of the highest ethical standards and insist that students behave ethically in all their professional activities.
- Interact with students in a professional and civil manner in accordance with the University policies and relevant laws.
- Ensure a reasonable degree of confidentiality in communicating with students, taking care not to discuss a student's performance, research results, or behavior with other students.
- Impartially evaluate student performance regardless of religion, race, gender, sexual orientation, nationality, or other criteria that are not germane to academic evaluation.
- Serve on graduate student committees without regard to the religion, race, gender, sexual orientation, or nationality of the graduate student candidate.
- Prevent personal rivalries with colleagues from interfering with their duties as graduate advisors, committee members, or colleagues.
- Excuse themselves from serving as advisors on graduate committees or supervising assistantship work when there is a familial or other relationship between the faculty member and the student that could result in a conflict of interest.
- Not impede a graduate student's progress and completion of his/her degree in order to benefit from the student's proficiency as a teaching or research assistant.
- Encourage students to learn creatively and independently respect the academic freedom of students to express opinions that may differ from those of faculty.
- Provide oral or written comments and evaluation of students' work in a timely manner.
- Discuss laboratory and/or departmental authorship policy with graduate students before entering into collaborative projects.
- Ensure an absence of coercion with regard to the participation of graduate students as human research subjects in the faculty advisor's research.
- Refrain from requesting students to do tasks unrelated to their academic or professional development for the personal advantage of a faculty member.
- Familiarize themselves with policies that affect their graduate students.

Teaching

No matter what career a graduate student enters after degree completion, experience in teaching will be useful; presentations, evaluation and assessment, leading discussions, and the like, are activities that take place not only in the academy, but in a wide range of business, industrial, and government settings. Teaching includes interactions with students about instructional issues, such as holding office hours, reviewing tests or paper scores/evaluations with students, answering questions in special teaching centers in the discipline, tutoring, conducting labs, leading discussions, assisting students to solve problem sets, commenting on studio work, lecturing, or mentoring undergraduate researchers. Graduate students and faculty should work together to enhance student learning and promote the professional development of the graduate teaching assistant.

Graduate Student Role

- Work cooperatively with supervising faculty and other teaching assistants to accomplish the tasks set out by the TA assignment.
- Give adequate attention to the teaching role by conscientious efforts in planning, preparing, and implementing TA assignments.
- Achieve an appropriate balance between teaching responsibilities and other essential activities
- Take advantage of orientation and training opportunities offered as professional development; use the library and other services provided by Graduate Studies on teaching and learning.
- Proactively seek varied teaching opportunities.
- Engage in reflective evaluation of teaching activities.

Faculty Role

- Provide adequate training for teaching assistants appropriate for the responsibilities they will assume; in some cases training may be available through campus-wide or department training programs.
- Provide appropriate communication with and mentorship for teaching assistants to enhance their professional development and to ensure the quality of student learning.
- Develop a clear understanding with graduate students about their specific TA responsibilities, including division of authority and labor, expectations for performance, and the like.
- Observe the student's teaching to provide feedback on, and assistance for, current activities and recommendations for the student's future employment.
- Identify appropriate departmental and campus resources to assist graduate students in their professional development as teaching scholars.
- Foster opportunities for students to attain teaching competence.

Research

A student's academic performance and a faculty member's scholarly interest may coincide during the course of instruction and research/creative activity/performance. As the faculty-graduate student relationship matures and intensifies, direct collaborations may involve the sharing of authorship or rights to intellectual property developed in research or other creative activity. Such collaborations are encouraged and are a desired outcome of the mentoring process.

Graduate Student Role

- Learn the research methods, ethical dimensions, and historical knowledge bases of the discipline.
- Abide by the University's policy on research misconduct. This policy applies to researchers in all disciplines.
- Recognize that the faculty advisor, in nearly every case, will determine when a body of work is ready for publication and what is an acceptable venue, since the faculty advisor bears responsibility for overseeing students' performance and ensuring the validity of the research.
- Recognize that the faculty advisor provides the intellectual and instructional environment in which the student conducts research, and may, through access to teaching and research funds, also provide the student with financial support.
- Maintain absolute integrity in collecting, analyzing, and presenting research data.

- Preserve the data collected during experiments or noted during research (with precise identification of sources) to avoid future confusion or disputes about access or ownership.
- Acknowledging the contributions of the faculty advisor and other members of the research team to the student's work in all publications and conference presentations. (It is also appropriate to acknowledge the sources of financial support).
- Expect that their research results, with appropriate recognition, may be incorporated into progress reports, summary documents, applications for continuation of funding, and similar documents authored by the faculty advisor, to the extent that the student's research is related to the faculty's research program and the grants which support that research.
- Recognize that the faculty advisor is responsible for monitoring the accuracy, validity, and integrity of the student's research. Careful, well-conceived research reflects favorably on the student, the faculty advisor, and the University of Nebraska.
- Maintain the confidentiality of the faculty advisor's professional activities and research prior to presentation or publication, in accordance with existing practices and policies of the discipline.

Faculty Role

- Provide students with knowledge of the current frontiers and opportunities in disciplinary and inter- or cross-disciplinary research.
- Clarify expectations for specific research responsibilities, including time lines for completion of research and the thesis or dissertation.
- Provide appropriate guidelines, including expected timetables, for completion of research projects, and respect students' research interests/goals.
- Acknowledge student contributions to research presented at conferences, in professional publications, or in applications for copyrights and patents
- Openly discuss authorship and intellectual property policies with graduate students.

Advising and Mentoring

The relationship between the graduate student and their graduate faculty supervisor is central to excellent graduate education. Graduate students develop best in a closely monitored environment in which the faculty provide both high expectations and high support.

Graduate student progress toward educational goals at the University of Nebraska is directed and evaluated by a graduate faculty advisor, the relevant graduate committee, and the student's supervisory committee. The advisor and the individuals on the committee provide intellectual guidance in support of the scholarly/creative activities of graduate students. The advisor, the supervisory committee, and the graduate committee also are charged with the responsibility of evaluating a graduate student's performance in scholarly/creative activities. The graduate student, the advisor, the supervisory committee, and the graduate committee comprise the basic unit of graduate education at UNL. It is the quality, breadth, and depth of interaction within this unit that largely determines the outcome of the graduate experience.

Graduate Student Role

- Devote an appropriate amount of time and energy toward achieving academic excellence and earning the advanced degree.
- Recognize time constraints and other demands imposed on faculty members and program staff.

- Initiate regular communications with faculty advisors, especially in matters related to research and progress within the graduate program.

Faculty Role

- Provide clear maps of the requirements each student must meet, including course work, languages, research tools, examinations, and thesis or dissertation, and delineate the amount of time expected to complete each step. A graduate student handbook, including written documentation of departmental policies, program requirements and expectations for satisfactory performance can serve this purpose.
- Evaluate student progress and performance in regular and informative ways consistent with the practice of the field; offer fair opportunities for students to correct deficiencies in their work.
- Set aside adequate time to meet with students.
- Help students develop artistic, interpretive, writing, oral, and quantitative skills, in accordance with the expectations of the discipline.
- Assist graduate students in the development of grant writing skills, where appropriate.
- Take reasonable measures to ensure that each graduate student initiates a thesis or dissertation research in a timely manner.
- When appropriate, encourage graduate students to participate in professional meetings or perform or display their work in public settings.
- Create an ethos of collegiality so that learning takes place within a community of scholars.
- Provide a realistic view of the field and the current job market and make use of professional contacts for the benefit of their students, as appropriate.

Source

This is an updated version of the *Guidelines for Good Practice in Graduate Education* approved for distribution by the UNL Graduate Council in 1997. We gratefully acknowledge the earlier work of the of the following institutions: the Graduate College and Graduate Council at the University of Arizona; the Office of Graduate Studies at the University of California at Davis; the Office of Graduate Studies at the University of Southern California; the Graduate School at North Carolina State University and the Graduate Council at the University of Oregon. These guidelines are intended to be constructive and instructive to faculty and graduate students. They do not constitute a contract with current or prospective students.

Admission

Graduate Studies

INTERESTED IN APPLYING FOR ADMISSION?

If so, this policy handbook probably isn't what you want. Instead, check out our Prospective Students (<http://www.unl.edu/gradstudies/prospective>) section for Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs>), Steps to Admission (<http://www.unl.edu/gradstudies/prospective/steps>), and more.

Prospective students apply for admission using the Prospective Students (<http://www.unl.edu/gradstudies/prospective>) section of the main Graduate Studies site; most do so without needing to consult this catalog for policy details.

Eligibility

The Graduate College (UNL Graduate Studies) is open to graduates of all colleges of this University and to graduates of other universities and colleges of recognized standing whose requirements for graduation are substantially the same as those in the corresponding colleges of this University. Students are selected on the basis of academic preparation, ability, and the availability of space in the desired academic program. *The University of Nebraska is a public university committed to providing a quality education to a diverse student body, and the University's nondiscrimination policy* (<https://catalog.unl.edu/graduate-professional/graduate/admission/%20graduate-professional/graduate/general/conduct/#nondisc>) *is applicable to all University activities, including admissions.*

Applicants must hold a **baccalaureate or higher degree** from an institution that is regionally **accredited**, an institution that is accredited by an organization recognized by the Council on Higher Education Accreditation (CHEA), or from an accredited foreign institution that is recognized by Graduate Studies.

Special groups:

- **UNL seniors within 9 hours of graduation** may apply and be granted admission to UNL Graduate Studies. This admission and continued enrollment would be contingent upon receipt of the baccalaureate within the calendar year and would make one ineligible to continue any undergraduate scholarship or financial aid, but would allow one to apply for any financial support, fellowships, or assistantships open to graduate students.
- International Students (p. 497)
- Faculty Seeking Additional Degree (p. 496)

Persons who have been **dismissed** from another institution for academic dishonesty or violations of student codes of conduct are not eligible for admission to UNL Graduate Studies.

Procedure and Materials

All materials submitted become the **permanent property** of Graduate Studies and will not be photocopied for individual use, returned, or forwarded to other agencies.

Information given falsely or withheld will affect the decision on an application and may make the applicant ineligible for admission and/or enrollment.

Most students apply and enroll toward just one graduate degree program at a time. It is possible, however, to **apply to two programs** simultaneously. To do so, treat each application as a completely separate entity, supplying for each an application, application fee, and any departmental materials. If accepted by both programs the applicant must select one program to enter, unless admission is for a double-major or dual-degree (p. 496) program. When an enrolled student plans to pursue a new program upon completion of another, it is advisable to apply for admission to the new program early in the academic year in which one plans to graduate.

Change of program: A graduate student, formerly or currently enrolled, who wishes to pursue a degree objective other than the one originally sought, must initiate a formal application for the new program by filing a new graduate application form, supplementing existing records,

and fulfilling any departmental requirements prior to review by the departmental Graduate Committee and the College.

Admission Decisions

Acceptance for admission to a program leading to a master's degree, a doctoral degree, an educational specialist degree or a certificate is determined by the Graduate Committee within the academic unit and the Dean for Graduate Studies. This decision is based upon the applicant's record, experience, personal qualifications, and proposed area of study.

Departmental or area Graduate Committees make recommendations on all degree applications, but the final admission decision is the responsibility of the Dean for Graduate Studies. Notification of acceptance by a department Graduate Committee or faculty member is advisory only. Admission is granted solely by Graduate Studies and is confirmed by the issuance of a **Certificate of Admission**.

Academic departments will notify applicants concerning awards of financial assistance.

Negative admission decisions are not appealable.

Entry (Initial Enrollment)

Entry into UNL Graduate Studies is valid for the **specific semester indicated on the Certificate of Admission**.

US Military Veterans: All men and women who plan to attend the University and will be affected by the educational assistance and vocational rehabilitation laws administered by the Veterans Administration should inquire at the Office of the University Registrar (<http://registrar.unl.edu>) before registering for classes. See also: Veterans Resources (<http://registrar.unl.edu/veterans-resources>).

A newly admitted student may **defer enrollment** for a maximum of two terms if he or she meets certain Graduate College requirements and if the department in which graduate study would be pursued consents to the delay. Any funding offered for the original entry term is not guaranteed for the later entry term. Graduate Studies retains the right to revoke the earlier admission on the basis of new information or limited resources. International students who wish to delay their enrollment may be required to provide updated financial information for a new I-20 or DS-2019 immigration form.

Admitted students who neither defer nor enroll must reapply.

Admission Categories

Graduate Studies

INTERESTED IN APPLYING FOR ADMISSION?

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Graduate students may be admitted into one of the following categories.

Degree or Graduate Certificate

Admission to the Graduate College as a degree-seeking or graduate-certificate-seeking student requires application to both Graduate Studies and the Graduate Committee within an academic unit. Applicants must submit an application, application fee, and one official transcript

from all post-secondary schools attended, and fulfill any additional requirements the department specifies such as statement of goals, test scores, portfolios, etc. Requirements specific to each program are listed in Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs>).

A current student who wishes to change to a different program should consult the Master's Specialist (<http://www.unl.edu/gradstudies/current/degrees/masters>) or Doctoral Specialist (<http://www.unl.edu/gradstudies/current/degrees/doctoral>); in some cases a new application is not necessary.

Non-Degree

Non-degree, post-baccalaureate admission to the Graduate College is completed through Graduate Studies. Applicants are reviewed for minimum standards upon receipt of an application, application fee and one official transcript showing conferral of a baccalaureate or higher degree.

Special Categories and Objectives

- Students seeking another undergraduate degree should contact Undergraduate Admissions for advising and assistance.
- Students seeking a non-degree admission for an initial teacher certification, renewal of a teacher certification, or additional teaching endorsements should refer to the College of Education and Human Sciences' Teacher Certification and Renewal (<http://cehs.unl.edu/cehs/applying-your-teaching-certificate>).

Limitations

- Non-degree admission carries no guarantee of future admission to a degree program, nor does it guarantee that coursework completed as a non-degree student can later be applied toward a degree.
- Non-degree admission does not qualify students for assistantships or fellowships. Financial aid (<http://financialaid.unl.edu>) in the form of student loans is limited to those taking only undergraduate hours as prerequisites for admission to a specific graduate or professional program.
- Non-degree admission is not available to international students on F-1 student visas.

Changing From Non-Degree to Degree Status

It is imperative that any non-degree student who expects to later enter a degree program consult that program's academic department about the limitations on credit hours that may be completed prior to entry into the program. To enter a degree program, the student must apply to it through Graduate Studies and be recommended for admission by the degree program's Graduate Committee prior to completing half the hours required by the program. **There is no guarantee that credits earned as a non-degree student will be applied toward a graduate degree.** Some graduate-level hours completed by non-degree students prior to degree program enrollment may be included in a plan of study at the discretion of the major and/or minor department and with the approval of the Dean for Graduate Studies.

Visiting and Intercampus

Visiting From Outside NU

Admission is available to applicants who are actively pursuing graduate studies at U.S. institutions other than the University of Nebraska campuses, and requires submission of an application, application fee, and letter of good standing from the home institution. Enrollment

is limited to two consecutive terms (semesters and/or full summer enrollment).

Intercampus Within NU

Students already attending one NU campus (UNL, UNK, UNMC, or UNO) may take a few courses at another NU campus while retaining their admission at their degree-objective (home) campus by submitting the Request for Intercampus Enrollment (<http://go.unl.edu/intercampus>), subject to approval by both campuses.

Admission into Concurrent or Combined Programs

Graduate Studies

INTERESTED IN APPLYING FOR ADMISSION?

If so, this policy handbook probably isn't what you want. Instead, check out our Prospective Students (<http://www.unl.edu/gradstudies/prospective>) section for Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs>), Steps to Admission (<http://www.unl.edu/gradstudies/prospective/steps>), and more.

See Majors, Minors, and More: Concurrent or Combined Programs (p. 503) for definitions and additional policies pertaining to Double Major, Dual Degree, and Joint Degree.

Admission to a Double Major

The professional and scholastic goals of some graduate students may be enhanced substantially by acquiring more knowledge than is provided by earning a minor. They can do this by studying in a second field as a double major.

1. **Applying to Two Majors at Once:** New applicants submit one application for each major program and only one application fee, and specify in the form's comment section that they are seeking a double major.
 - The applicant completes each program's application requirements, and each program's graduate committee reviews the application.
 - A decision by one graduate committee does not affect the decision of the other; criteria for acceptance may differ.
 - Acceptance to one or both does not guarantee admission for a double-major degree. Final approval rests with the Dean for Graduate Studies.
2. **Adding a Second Major to a Degree in Progress:** If a student currently in a degree program decides to pursue a second major, a new application is required for the second major.
 - The student declares the intent to add a second major (rather than switch majors) in the form's comment section.
 - The new application is subject to approval by the original major's graduate committee prior to review by the second major's committee.

Admission to a Dual Degree

To be a degree-seeking graduate student in more than one UNL degree program, a student must apply separately to both programs and receive admission to both programs, with the approval of graduate chairs for both programs and the Dean for Graduate Studies.

When a student has received admission for two master's programs, the same course credit will not be accepted for more than one degree without prior approval of the Graduate Program Committees through which the programs are administratively assigned and the Dean for Graduate Studies.

See Majors, Minors, and More (<https://catalog.unl.edu/graduate-professional/graduate/admission/dual-double-joint/%20/graduate-professional/graduate/degrees/majors>) for a list of established dual degree programs. See program summaries (<http://www.unl.edu/gradstudies/prospective/programs>) for application instructions and departmental contacts.

Admission of Faculty and Staff

Graduate Studies

INTERESTED IN APPLYING FOR ADMISSION?

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Faculty

Faculty Seeking Additional Degree

A member of the faculty in an instructional department who holds the rank or equivalent rank of assistant professor or above, or who holds an appointment for a specific term, or a member of the administrative staff holding the rank of assistant professor or above, may pursue a graduate degree at NU only after receiving special permission from the cognizant academic dean or administrative supervisor and from the campus Graduate Council responsible for the program which the faculty member wishes to pursue.

The degree cannot be in the faculty member's own department or in a closely-related department or area. Whether it is **too closely related** shall be determined by the Dean for Graduate Studies of the campus involved, in consultation with the Graduate Committees of the two departments or areas. Permission may be granted to pursue a degree in the equivalent department on another NU campus.

Graduate Faculty will have that status suspended upon receiving permission to pursue an advanced degree in the Graduate College.

- With **permission** from the appropriate campus Dean for Graduate Studies and Graduate Committee, they are eligible to continue to teach graduate courses, supervise graduate students at a level commensurate with their former rank in the Graduate Faculty, and serve on graduate supervisory and examining committees.
- Upon completing or withdrawing from an advanced degree program, the original Graduate Faculty status shall be **reinstated** upon recommendation by at least two-thirds of the Graduate Faculty of the department or area if the person returns to the same department in which they held an appointment originally. A change of appointment to another department requires that the person follow the established procedure for obtaining Graduate Faculty status.

Faculty Non-Degree Admission

Members of the university community employed on a permanent full-time basis and holding the rank of Assistant Professor or above may be admitted on a non-degree basis to take courses for personal and

professional growth by supplying an Application for Graduate Admission and the application fee.

Staff

All other University staff members are eligible for admission to all graduate admission categories and are subject to standard admission requirements.

Admission of International Students

Graduate Studies

INTERESTED IN APPLYING FOR ADMISSION?

If so, this policy handbook probably isn't what you want. Instead, check out our Prospective Students (<http://www.unl.edu/gradstudies/prospective>) section for Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs>), Steps to Admission (<http://www.unl.edu/gradstudies/prospective/steps>), and more.

The University of Nebraska-Lincoln welcomes students from all countries as part of the student body and Graduate Studies encourages applications from qualified students throughout the world.

Eligibility

It is recognized that educational systems in other countries differ from that of the United States. Comparability of international course work and degrees will be determined by departmental Graduate Committees and by Graduate Studies. Generally, a four-year first university degree from an academic institution outside the U.S. will be accepted as comparable to the U.S. bachelor's degree (<http://www.unl.edu/gradstudies/prospective/international/degrees>) if the degree grants eligibility for graduate study at institutions within the same country.

How and When to Apply

Application materials from international students must include uploaded copies of all college- or university-level transcripts or mark sheets (<http://www.unl.edu/gradstudies/prospective/international/transcripts>) (records of courses and marks earned), with certificates, diplomas, and degrees plus certified English translations. These unofficial documents will be used for application review. Official documents are required from all students who are admitted and enroll. Photocopies of certified records cannot be used. Students enrolled in other U.S. institutions may have certified copies of all foreign records sent directly to Graduate Studies.

It is recommended that applicants outside the U.S. begin applying approximately one year in advance of the desired first enrollment. See Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs>) for deadlines for each program.

All international applicants seeking F-1 student visas must apply for degree programs rather than non-degree, post-baccalaureate status.

Funding Requirements

Evidence of adequate financial resources (<http://www.unl.edu/gradstudies/prospective/international/financial>) for tuition and living expenses is required of all international students seeking F-1 or J-1 visas, including those who received their baccalaureate degrees at UNL. Students should not assume funds or work opportunities will be available at a later date, and should be prepared to have their living and educational expenses increase annually. University-wide fellowships may

be sought after one year of graduate study in the U.S. More information is available to eligible candidates from Graduate Studies.

English Proficiency

See English Proficiency (<http://www.unl.edu/gradstudies/prospective/international/english>) in our Prospective Students section for additional information.

When Applying: TOEFL or IELTS

Applicants to the Graduate College whose native language is not English are required to submit a Test of English as a Foreign Language (TOEFL) score of at least 550 on the paper-based TOEFL; 79 on the Internet-based TOEFL or an International English Language Testing System (IELTS) overall band score of at least 6.5. Some departments require higher scores for admission.

Upon Arrival: English Language Test (ELT)

Typically all new international students are required to take the ELT upon arrival in Lincoln if they are not native speakers of English and their scores are:

- A TOEFL iBT writing score below 25 or a TOEFL total below 100
- An IELTS writing score or total IELTS score below 7.0

Each international student's Certificate of Admission will state whether they are required to sit for the ELT. Exemptions from the ELT requirement may be granted based on sufficiently high TOEFL or IELTS writing scores, or for non-native speakers who have received a bachelor's or more advanced degree from a U.S. university or a university outside the U.S. at which English is the official language of instruction.

International Teaching Assistant Institute

New holders of teaching assistantships (p. 511) who are non-native speakers of English must attend the International Teaching Assistant Institute (<http://www.unl.edu/gradstudies/current/ita>).

Registration

Graduate Studies

General

Procedures and dates pertaining to registration are provided by the Office of the University Registrar (<http://registrar.unl.edu>) and the Academic Calendar (<http://registrar.unl.edu/academic-calendar>). Additional questions concerning graduate-level registration may be referred to Graduate Studies.

Enrollment eligibility closes after three consecutive terms without enrollment. Formerly-enrolled graduate students who have not attended classes for one year or more may request reactivation by emailing graduate@unl.edu.

Drop and Add

Students may drop or add classes from the beginning of priority registration through the last day on which classes may be added for a term, as published in the Academic Calendar (<http://registrar.unl.edu/academic-calendar>).

- Students who do not register for classes until after the beginning of the term will be charged a late registration fee.

- After the end of the add period, a course may be added to a student's record only with permission from the instructor and Graduate Studies.
- Tuition liability for a course begins after the add period for a term.

Impacts of Withdrawal

Before withdrawing from courses, some students should seek information on the ramifications of withdrawal:

- **Graduate assistants** should contact their department Graduate Chair.
- Students withdrawing **after the term's last day to add classes** should contact the Office of Scholarships and Financial Aid (<http://financialaid.unl.edu>) about potential impacts on eligibility for aid or loan deferral.
- **International students** should consult the International Student and Scholar Office (<http://isso.unl.edu>).

All courses dropped after the **second week** of the term are noted on the student's academic record (transcript) with a grade of "W" (withdrawn).

Timing of Withdrawal

Before the 3/4 point of the term, students may withdraw from classes regardless of circumstance. A course drop becomes effective for tuition and grade purposes on the date the transaction is processed by the student.

After the 3/4 point of the term, any withdrawal from classes must be for extraordinary circumstances and will be granted only **by petition** through Graduate Studies, based on the following documentation:

1. A written request from the student within 60 days of the end of the term.
2. Written permission from the instructor.
3. Documentation for illness, death in the family or abrupt change in work schedule.

Correction of Registration Errors

A graduate student who has registered in error (for example, for the undergraduate level of a 400/800 course) should correct the error through the **normal drop and add process** during the term in which the error occurred.

In the event the error is not recognized until a grade is posted, the student may request correction of registration within **sixty days** of the posting of the grade to the Office of the University Registrar (<http://registrar.unl.edu>). Changes to a student registration record will not be made more than sixty days after grades are posted.

Auditing a Course

Auditing gives a student the privilege of attending class, but **credit is not earned** and a grade of AU is assigned when auditing a class. All persons wishing to audit a course must be admitted and eligible to enroll in classes for the term in which they audit. Tuition and fees for audited courses are the same as for graded courses. Audited courses cannot be applied toward a graduate degree or certificate.

To audit a course:

1. Register for the class online.
2. Pick up a Permit to Audit Card at the Office of the University Registrar (<http://registrar.unl.edu>).

3. Obtain the instructor's permission to audit the course by having him or her sign the Permit to Audit Card.
4. Turn in the signed Permit to Audit Card at the Office of the University Registrar no later than the last day to add a class for the term.

Academic Leave of Absence

Graduate Studies

Purpose

Graduate students are expected to maintain active status through continuous registration from the time they matriculate until they graduate. In the event that a student is unable to continue active participation, the student must complete an Academic Leave of Absence to temporarily suspend his or her graduate studies and the pursuit of a degree.

Policy

An Academic Leave of Absence may be granted to students for illness or injury, to provide care or assistance for family and dependents, to meet military service obligations, or for other personal reasons.

A leave can be used to suspend study for **one semester or more (up to a full academic year)** during which the student is not expected to make progress toward their degree.

- The one-year time limit can be **extended** for military service or in other cases subject to approval by Graduate Studies.
- A leave can be granted for **current and/or future** semesters only, not for prior semesters.

Students granted a leave are **not required to register for any credit hours** for the period covered by the leave.

- With no enrollment, no tuition and fee costs are accrued during the leave.
- The time limit for reaching candidacy or for completing the Ph.D. is extended only by the number of semesters the student is on leave.
- For Ph.D. students in candidacy, an approved leave satisfies the continuous enrollment requirement (p. 507).

Students **returning** from an approved leave do not need to be readmitted.

Eligibility

- Be a graduate student in good standing (3.0 or above), with at least one semester of prior graduate enrollment at UNL.
- Get approval from their graduate program.
- Have no course enrollments for the duration of the leave. If already enrolled during the leave, students must officially withdraw from those courses.
- If international, get approval from the International Student and Scholars Office (ISSO). SEVIS updates may be needed and immigration regulations may restrict eligibility; ISSO can help to identify other possible courses of action.

Implications

Students should expect to make **no academic progress** during a leave. A student on leave cannot:

- Take qualifying examinations for advancement to candidacy or final examinations for the degree (although language competency examinations are allowed)
- File a thesis or dissertation
- Make extensive use of faculty/staff time or resources (except for planning a return from leave)
- Receive academic credit for work done during the leave at another institution (unless approved in advance by the faculty advisor and Graduate Studies)

It is the responsibility of any student with **federal financial aid or loans** to consult the Office of Scholarships and Financial Aid and/or their loan agency before applying for a leave, to determine how a leave could affect aid, eligibility to defer loan repayment, and loan status.

A student on leave is not registered for classes and **does not receive the benefits, services, and eligibility** associated with registered-student status, including:

- Graduate assistantships or other student work titles and their benefits (e.g., tuition remission, student insurance, @unl.edu email address)
- UNL Libraries (unless applying for a “community member” library card)
- University Health Center and student health insurance
- UNL Campus Recreation Centers
- UNL fellowship support and research grants
- UNL graduate awards
- Most forms of University financial support
- Access to laboratories, equipment, and other controlled-access campus facilities

Students considering a leave are strongly encouraged to explore alternatives, discuss the impact on their plan of study with the graduate chair and their faculty advisor, and develop a strategy for completing the degree program.

In many cases students are better served by **alternatives that maintain enrollment and eligibility for student services**, for example:

- Modifying program expectations
- Reducing coursework, research, teaching or other educational responsibilities
- Working at a slower pace
- Delaying milestone deadlines
- Taking incompletes in the current semester with a plan to address them at a later time

Procedures

Requesting a Leave

1. Students consult their faculty advisor and their department’s graduate chair to determine whether a leave is the most appropriate course of action.
2. The student submits a completed Academic Leave of Absence form (http://www.unl.edu/gradstudies/current/Academic_Leave_Request_Form.pdf) to Graduate Studies with the required signatures.

3. Upon approval by Graduate Studies, an email notification with a copy of the signed form is sent to the student, graduate chair, and faculty advisor.

Extending a Leave

To extend an approved leave, students must notify the graduate program chair and their advisor at least four weeks prior to the end of the semester in which the leave terminates. An extension requires approval of the department and (if international) ISSO.

Returning from Leave

Students on academic leave must notify Graduate Studies of their intent to return: in writing, to graduate@unl.edu, at least four weeks prior to the end of the leave. The Master’s or Doctoral Specialist will notify the graduate chair and the faculty advisor of the student’s intent to return.

Grades (Including In Progress and Incomplete)

Graduate Studies

Grading System

The University uses an A through F grading system.

- Letter grades with point value:
 - A+ (4.0), A (4.0), A- (3.67)
 - B+ (3.33), B (3.0), B- (2.67)
 - C+ (2.33), C (2.0), C- (1.67)
 - D+ (1.33), D (1.0), D- (0.67)
 - F (0)
- Grades without point value:
 - W (dropped/withdrew)
 - I (incomplete), IP (in progress), XP (no progress)
 - P (pass/C or better), N (no pass)

Graduate students taking undergraduate classes for deficiencies generally have a grade requirement set by the department. However, if no specific standard has been set, the graduate student is required to meet the same standard an undergraduate would be held to. That is, if the class is taken Pass/No pass, pass is the equivalent of a C or better.

Scholastic Grade Requirements

Credit in graduate-level courses is attained as follows:

- Within the student’s major department or area, for 800-level courses with 400 or lower counterparts:
 - Minimum grade of B required.
 - Courses graded B- or lower, or pass/no-pass (P/N), cannot be used on a Memorandum of Courses (master’s) or Program of Study (doctoral).
- Otherwise: For 900-level courses, 800-level courses without 400 or lower counterparts, or courses in minor, collateral, or supporting areas of work:
 - Minimum grade of C or P (pass) required.
 - Courses graded C- cannot be used on a Memorandum or Program.
 - The comprehensive exam for the minor may be waived only if all grades in the minor are at least a B or P (pass).

Graduate students who do not maintain satisfactory progress may be placed on probation, terminated from a degree program, and/or denied permission to continue graduate studies in the University.

In Progress vs. Incomplete

IP and XP: For research, thesis, and dissertation hours

- **In Progress (IP)** indicates satisfactory work in progress. The student is making progress or effort as determined by the faculty supervisor (research effort, literature review, draft chapters, etc.).
 - The IP stands until successful defense and acceptance of the research project, thesis, or dissertation, when a **P or letter grade** is submitted.
- **No Progress (XP)** indicates lack of adequate progress.
 - Because XP is not used in GPA calculation, no direct academic sanction (such as academic dismissal from the University) will be imposed for earning one or more XP grades. However, graduate programs may use a series of XP grades as a **basis for terminating a student** from the program. Graduate committees should define these criteria, document them in graduate student handbooks, and discuss the process with their students.

On a transcript IP and XP count toward attempted hours, but for Financial Aid they count differently. Any IP or XP grades remaining at graduation will convert to I, if not graded as P or with a letter grade.

Use of IP and XP instead of I for graduate research, thesis, and dissertation hours is recommended by the UNL Graduate Council as of October 9, 2014. The I grade impacts satisfactory academic progress (SAP) (<http://financialaid.unl.edu/sap.shtml>) assessments in ways that can result in a student's federal financial aid being suspended, while IP and XP differentiate whether progress is being made, enabling more appropriate assessment and avoiding unnecessary aid suspensions and appeals.

I: For any other courses/hours

The grade of **Incomplete (I)** should be used only for courses that are **not** graduate research, thesis, or dissertation hours.

For any I grade in a graduate course, the instructor of the course determines the requirements and deadlines for completing it. It is helpful to have these expectations in writing to prevent miscommunication.

- A student with a grade of I **should not re-register for that course** within the time frame for the removal of the I. Re-registration will incur new tuition charges.
- **If the instructor leaves the University** prior to the date set for the completion of a course, the chair of the academic department of the course will assume the role of the instructor.

When requirements are satisfied, the instructor replaces the I with a grade indicating completion. Some courses must become graded (not I).

- All Incomplete **courses on the Memorandum of Courses or Program of Study** must become graded prior to graduation.
- Graduate courses **not on the Memorandum or Program** and not to be used to complete the degree may remain I. The grade of I will be on the transcript but will not affect the GPA.
- **Undergraduate courses** receiving an I will lapse into the grade of F after one calendar year.

Grade Appeals

Appeal of grades in graduate-level courses shall be made through the graduate student grade appeal procedures for the campus through which the grade was awarded.

- Students who believe their evaluation in a course has been prejudiced or capricious must first attempt to resolve the matter with the **Course Instructor** within 30 days of the posting of the grade report by the Office of the University Registrar.
- If unsuccessful, the student may then file a written appeal to the **Graduate Chair** for consideration by the Graduate Committee responsible for the administration of the course. This appeal must be filed within 60 days of the posting of the grade report by the Office of the University Registrar. If the department does not have a graduate program, the standing grade appeal committee of the department would consider the appeal. A written determination of the appeal shall be presented to the student and instructor.
- If the matter is unduly delayed or not resolved, the student may present the original appeal documentation to the **Dean of Graduate Education** who shall request a review by a subcommittee of the Graduate Council. A final appeal may be made to the full Graduate Council, if it agrees to hear the case. Since awarding grades in courses occurs at the individual campus level, the decision of the Graduate Council shall be final and is not subject to further appeal beyond the campus.
- If the instructor's grade is overturned, the instructor of record has the right of appeal, in writing, at the same successive levels of review.

SOURCE: Graduate Council Minutes (March 9, 1993; revised August 16, 2018)

Graduate Credit

Graduate Studies

Course Levels

Courses by number level:

- 800s and 900s: These are graduate courses. 800-level courses without counterpart 400-level or lower numbers, as well as 900-level courses, are open exclusively to graduate students except by permission of the Dean for Graduate Studies.
- 500s, 600s, and 700s: These are professional courses in law, dentistry, and architecture. Law courses carry graduate credit only if the letter "G" follows the course number.
- 400 or lower: These are undergraduate courses and cannot be applied toward a graduate degree.

A student who enrolls in a course must have completed the general prerequisite, including any specific prerequisite indicated for the course. In graduate-level courses there is a required differentiation of faculty expectation regarding student performance and grading criteria.

Credit by Examination

Credit by examination cannot be earned in graduate level courses or applied to graduate degree programs.

Transfer Credit

For any graduate degree, at least 50 percent of the minimum number of graduate credits required for the degree must be completed at the University of Nebraska.

To be accepted as transfer credits, graduate credits must be:

- Earned at an institution fully accredited to offer graduate work in the field of the student's major.
- For graduate coursework, not professional coursework.
- *To be accepted toward a master's degree:* Not older than 10 years or applied toward any previous graduate degree.
- *To be accepted toward a doctoral degree:* Not applied toward any previously completed doctoral degree.
- Approved by the graduate committee for quality, suitability, and being equal to or superior to offerings available at UNL.
- Approved by Graduate Studies.

It is the responsibility of the student to ensure that official transcripts of graduate work taken elsewhere are received by Graduate Studies well before the student plans to complete all other requirements for the UNL degree.

Graduate Credit for Undergraduates

Seniors at UNL may be permitted up to 12 hours of credit for graduate courses taken in addition to the courses necessary for their undergraduate degree, provided that these credits are earned the calendar year prior to receipt of the baccalaureate. **Holding graduate credit keeps a senior in an undergraduate college; the student should consult Scholarships and Financial Aid** (<http://financialaid.unl.edu>) regarding continuation of any undergraduate scholarships or financial aid.

- Before registering for graduate courses, seniors must obtain approval from Graduate Studies using the Grad Credit for Undergraduate Students form (<http://research.unl.edu/gradstudies/credit>).
- Courses taken prior to completion of a bachelor's degree do not always transfer as graduate credit to other institutions, nor can there be a guarantee from Graduate Studies that these courses will apply toward a particular graduate program.
- The general prerequisite for taking 800-level courses as an undergraduate is at least 12 hours of work in the same department or area of study. The general prerequisite for 900-level courses is at least 18 hours in the same department or area of study.
- Intercampus enrollment allows undergraduates at other University of Nebraska campuses to take graduate-level coursework at UNL. Any arrangement to hold for graduate credit must be made at the student's bachelor's-degree campus; UNL can certify graduate credit only for those students graduating from UNL. Students from outside the University of Nebraska must wait until they qualify as graduate students to receive graduate credit.

Double-Counting

"Double-counting" refers to the use of a limited number of credit hours toward the requirements of two separate degrees or programs. This allows the student to earn two degrees for fewer total credit hours than would normally be required if both programs were taken independently.

At the departmental level, graduate committees may stipulate that credits for core-requirement courses cannot be double-counted in their programs.

Two Master's Degrees: In general, no more than nine credits may be double-counted. Both degrees must be completed within the time allowed and awarded at the same commencement. If awarded at separate commencements, double-counting is not allowed.

Master's and Doctorate (Distinct Disciplines): In general, no more than nine credits may be double-counted. Both degrees are completed within the time allowed. The master's degree must be awarded before the doctoral degree.

Master's En Route to Doctorate (Same Discipline): Upon recommendation by the graduate program, a doctoral candidate may earn a master's degree in the same discipline, upon completion of the master's degree requirements or upon successful passing of the comprehensive exam. The degree may not be awarded retroactively.

Established Dual Degrees: Generally, there can be no more than a 30% credit overlap between degrees based on the lower credit requirements. Policy is specific to the dual degree programs at UNL.

Graduate and Professional (e.g., PhD-JD, MCRP-MArch): Generally, there can be no more than a 30% credit overlap between degrees based on the lower credit requirements. Both degrees must be completed within the time allowed.

Graduate Degree and Graduate Certificate: Certificate courses may be used toward the completion of a degree as determined by the departmental or interdepartmental Graduate Committee administering the certificate program. Contact the program's Graduate Chair for more information.

Two Graduate Certificates: Double-counting is not allowed.

Accelerated Master's: In general, no more than 12 credits may be double-counted between the bachelor's and master's programs.

Registration Requirements

Graduate Studies

Summary

Minimum enrollment requirements for certain statuses or outcomes are as follows. Full-Time Certification (p. 502) is abbreviated here as FTC.

Status or Result	Min Enr. Fall or Spring	Min Enr. Summer
Full-time status	9 cr, 1 cr if FTC	6 cr, 1 cr if FTC
Eligibility for typical assistantship (some depts. require more)	1 cr	0 cr
Exemption from FICA/Medicare withholding on assistantship	4 cr, 1 cr if FTC	4 cr, 1 cr if FTC
Access to UNL services (Libraries, Health Center, Rec Center as described below)	1 cr	1 cr

Access to Services

Registration is required for services such as door access, the Recreation Center, the University Health Center, and some Library resources.

Students who pay the University Health Center (UHC) fee are able to access reduced-cost healthcare services at the UHC. Students enrolled in less than 7 cr per term pay a reduced University Program and Facilities Fee (UPFF) that does not include the UHC fee; to use the UHC they may pay the UHC fee or procure UHC services on a fee-for-service basis.

Doctoral Candidacy

Doctoral students who have advanced to candidacy status must be registered every fall and spring semester until they graduate, in accordance with the Guidelines for Registration During Doctoral Candidacy (p. 507). Failure to maintain registration may result in the termination of the student's program.

Full-Time Status

Hour Requirements

Graduate students are considered full time when registered for 9 credit hours during an academic semester or at least 6 credit hours during the summer.

Status	Academic Year	Summer
Full-time (F)	9 cr	6 cr
3/4-time (T)	6-8 cr	4-5 cr
1/2-time (H)	4-5 cr	3 cr
Less than 1/2-time (L)	1-3 cr	1-2 cr

Full-Time Certification

Thesis-option master's students (Option I) (p. 509) and doctoral students in candidacy may request full-time certification (<http://research.unl.edu/gradstudies/fulltime>) each semester they are under-enrolled, for the time allowed for their degree.

- Eligibility: The student must be currently registered for at least one credit hour and have been registered at least half time (i.e., at least 4 credits) in the fall and spring terms prior to the initiation of the full-time certification status.
- Limitations: Master's students may use full-time certification no longer than 3 consecutive terms; doctoral candidates may use it no longer than 24 consecutive months.

Summer Assistantship

Graduate assistants are not required to register for courses during the summer term. Graduate assistants employed in the summer but who are not registered for 4 credit hours or certified full-time during the summer term are subject to FICA and Medicare taxes.

Financial Aid

Status	Academic Year	Summer
Full-time (F)	9 or more cr	8 or more cr
3/4-time (T)	6-8 cr	6-7 cr
1/2-time (H)	4-5 cr	4-5 cr

Summer minimum registration for financial aid is 4 credit hours. These credits may be in different summer sessions; aid is disbursed in the session the student reaches half-time enrollment.

Employment

Graduate students holding any **fellowship(s)** are required to be enrolled as a **full-time** student as defined above. Students with external or departmental fellowships must follow the specific granting agency requirements.

Graduate students holding a **traineeship** are required to be enrolled **full-time** or be full-time certified during the tenure of their traineeship. Other remunerative employment must follow the granting agency requirements.

Graduate assistants may not work more than **19.6 hours per week**, all jobs considered, including assistantship(s) and paid internships. Internships are considered work in a training environment related to the student's educational career for which they receive pay; an assistantship and an internship may not be held by a student simultaneously if the total hours between the two equal more than 19.6 hours per week. This applies to fall and spring terms only.

Graduate students **not employed**, or graduate research assistants performing duties that are **100% thesis related**, may register for a maximum of 15 credit hours during an academic year semester, 6 credit hours during one five-week summer session, 9 credit hours during one eight-week summer session, or 3 credit hours during the pre-session.

Maximum Registration Guidelines

Graduate students who are employed are advised not to exceed the following registration guidelines established by the Graduate Council.

Hours Employed Per Week	Fall or Spring	Summer 8-Week	Summer 5-Week	Summer 3-Week(1)
0 hrs	15 cr	9 cr	6 cr	3 cr
8-16 hrs	12 cr	8 cr	5 cr	2 cr
17-20 hrs	10 cr	6 cr	4 cr	2 cr
Full-time	6 cr	4 cr	3 cr	1 cr

¹ One course permitted in the Summer 3-Week term for a maximum of 3 credit hours.

These guidelines reflect the fact that graduate-level course work serves mainly as a guide for independent, scholarly study. Graduate students are expected to master subjects and to devote substantial time in independent library and laboratory investigation beyond minimum credit hour requirements.

For courses offered within a summer session, a general guideline is a maximum registration of 1 credit hour per week of instruction.

Tuition and Fees

Graduate Studies

Rates

Tuition and fee rates are published by Student Accounts (<http://studentaccounts.unl.edu>) and subject to change at the direction of the Board of Regents.

Regulations pertaining to **Nebraska resident status for tuition purposes** are established by the Board of Regents. Initial determination of resident status is made at the time of admission and is noted on the Certificate of Admission. If a non-resident student wishes to change status, it is necessary to file a residency application with Graduate Studies. Requirements for resident status are included with the Application for Residency Classification for Tuition Purposes (PDF) (<http://go.unl.edu/residency>).

Refunds

Students who withdraw from the University within the first four weeks of a semester, or within the first two weeks of a summer session, may be entitled to a fractional refund of tuition, as listed in the Academic Calendar (<http://registrar.unl.edu/academic-calendar>). The conditions of eligibility for refunds are subject to change.

Graduate Assistants

Students holding a benefits-eligible graduate assistantship (p. 511) may receive tuition remission of up to 12 hours per semester during the fall and/or spring semesters plus a portion of the student's health insurance premium.

- Payment of the student's portion of the health insurance premium, University program and facilities fees, library fees, technology fees, registration fees, special course fees, are the student's responsibility.
- If a graduate assistant resigns or terminates the assistantship during the semester before four full months of service, all benefits will be lost. The student then is responsible for the total tuition payment and health insurance premiums.

University Staff Scholarship

Members of the academic-administrative, managerial-professional, and office-service staffs employed full time are eligible for the Employee and Dependent Scholarship Program (<http://hr.unl.edu/general/dependentscholarship.shtml>).

Academic Program Requirements

Graduate Studies

The University of Nebraska-Lincoln offers over 160 different graduate programs: master's degrees, doctoral degrees, Educational Specialist degrees, and graduate certificates.

See Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs/colleges>) for current counts and offerings.

Majors, Minors, and More

Graduate Studies

Majors and Degrees

Approved major-degree programs are listed in Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs/colleges>). Graduate Studies requirements for completing a program are described in master's (p. 508), doctoral (p. 504), and Ed.S. (p. 509) overviews.

Concurrent or Combined Programs

Definitions

In all three cases, work for both programs must be completed at the same time.

- **Double Major:** One degree is conferred, with one diploma; two majors are completed and both are listed on the transcript.
- **Dual Degree:** Two degrees are conferred, with two diplomas. The degrees may be from two different institutions within the University of Nebraska (UNL, UNK, UNO, UNMC).
- **Joint Degree:** One degree from two institutions within the University of Nebraska. There is currently one approved joint degree program offered in Educational Administration (UNL-UNO or UNL-UNK).

Master's Degree with Double Major

After earning Admission to a Double Major (p. 496), students must meet minimum requirements for each of the majors. A minimum of **half the hours** must come from each major; the number of credits may vary based on the total required hours for each major. For each of the two majors, students must take a minimum number of credits, as specified for their Option, (p. 509) in courses open only to graduate students.

The student must satisfy the **comprehensive examination** requirements for each major.

- The examining committee shall consist of two graduate faculty members from each of the major departments/areas; it shall be co-chaired by one from each.
- All committee members must be resident Graduate Faculty, Graduate Faculty Associates, or courtesy members. At least one of the two members from each department must be Graduate Faculty or Graduate Faculty Associates.

Doctoral Degree With Double Major

At the doctoral level, five double majors are approved. Any other major pairings are subject to approval by the departmental graduate committees and the Dean for Graduate Studies.

- Statistics & Agricultural Economics
- Statistics & Agronomy
- Statistics & Animal Science
- Statistics & Economics
- Statistics & Natural Resource Sciences

Completed Degrees

After a degree is conferred, a second major cannot be added to it. Instead a student may apply for admission to a second program, and once admitted, complete all requirements of a full independent program.

Dual Degree Programs

The following dual degree programs have been established. *Individualized dual degree programs not listed here may be approved on a case-by-case basis by graduate chairs and the Dean for Graduate Studies.*

- Architecture (MArch) and business (MBA)
- Architecture (MArch) and community and regional planning (MCRP)
- Civil engineering (MS) and community and regional planning (MCRP)
- Law and accountancy (MPA)
- Law and business administration (MBA)
- Law and community and regional planning (MCRP)
- Law and educational studies (PhD)

- Law and journalism and mass communications (MA)
- Law and political science (MA)
- Law and psychology (MA or PhD)
- Legal Studies (MLS) and Psychology (PhD)

Second Master's Degree

Students who have earned a previous graduate degree at any institution may pursue additional degrees at the master's level. The subsequent master's degree(s) may be in the same discipline as the previously earned degree, or in a different discipline.

As described in Double-Counting (p. 500) policy:

- No graduate credits **from a graduate degree previously awarded** at any institution, including UNL, will be accepted toward a subsequent master's program.
- Graduate credits **not previously applied** toward a degree may be considered for transfer to a subsequent master's if the graduate credits were earned within 10 years prior to completing the master's degree at UNL.

Minors

A minor is a course of study in addition to the major, effectively an abbreviated second major.

- For any major approved to offer a master's degree (<http://www.unl.edu/gradstudies/prospective/programs/colleges>), a minor of the same name is offered.
 - For example, an MA in History exists so a minor in History is available.
- A few additional minors have been established without a corresponding master's-level major. Some of these are also available as specializations.
 - Beef Cattle Nutrition
 - College STEM Education
 - Construction Management
 - Developmental and Learning Sciences
 - Medieval and Renaissance Studies
 - Quantitative, Qualitative, and Psychometric Methods (also available as a specialization)
 - Water Resources Planning and Management (also available as a specialization)
 - Women's and Gender Studies (also available as a specialization)

Master's Minor

A master's student may declare a minor on the Memorandum of Courses.

- A minor under any Option must consist of at least 9 credit hours.
- Depending on the Option (p. 509), a minor may be optional, required, or unavailable.
- A faculty member from the minor department must sign the Memorandum of Courses and the Final Examination Report.

Doctoral Minor

A doctoral student may declare a minor in their Program of Studies.

- The minor's credit hours are included in the total for the doctoral program and must include at least 15 hours, with 6 hours in courses open exclusively to graduate students (900 level, or 800 level without 400 level or lower counterparts).

- A graduate faculty member from the minor program must be a member of the student's Supervisory Committee.

Specializations

A specialization is a well-defined focus within a particular major or set of majors, typically 9 to 12 hours, established by approval of the UNL Graduate Council.

A student may choose a specialization while applying for admission or later when filing a plan of study. Once added to a student's program, the specialization is listed with the major on official records and transcripts.

Areas of Study

Areas — also known as concentrations or emphases — are informal and do not appear in official records.

Doctoral Degrees

Graduate Studies

Doctoral Overview

Doctoral Programs Offered

UNL Graduate Studies oversees four doctoral degrees:

- Doctor of Philosophy (PhD)
- Doctor of Education (EdD)
- Doctor of Musical Arts (DMA)
- Doctor of Audiology (AuD) — *As of October 1, 2016, the AuD is administered by Graduate Studies. Revisions to this catalog to include the AuD are not yet complete.*

See Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs/colleges>) for a current list of degrees and majors, Majors, Minors, and More (p. 503) for related policy, and the Graduate School Glossary (<http://www.unl.edu/gradstudies/glossary/#degrees>) for a better understanding of the different degrees.

UNL also offers additional professional doctoral programs — e.g., JD, DPH, DVM — which are not overseen by Graduate Studies or covered by Graduate Studies policy.

Core Doctoral Requirements

To qualify for a doctoral degree, it is the student's responsibility to meet the following requirements as part of the Doctoral Degree Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral>):

1. Establish a Supervisory Committee (p. 505) prior to completion of one half of the doctoral coursework.
2. Complete a Program of Studies (p. 505), approved by the Supervisory Committee and filed in Graduate Studies prior to completion of one half of the doctoral coursework.
3. Achieve academic residency (p. 506).
4. Pass a comprehensive examination (p. 506) — written and potentially also oral — in the major and minor fields of study.
5. Achieve candidacy (p. 507) and satisfy requirements for registration during candidacy.
6. Prepare a dissertation (for PhD or EdD) or doctoral document (for AuD or DMA), pass a final examination (p. 507) (defense), and submit the approved final version to the University.

7. Complete all work for the doctoral degree within eight years of filing the Program of Studies in Graduate Studies.

Research Responsibility

All research involving human or animal subjects must receive approval from the Institutional Review Board (IRB) and/or the Institutional Animal Care and Use Committee (IACUC). The IRB New Protocol Submission form is completed online via NUGrant (<http://nugrant.unl.edu>); the Application to Use Animals is available from the Office of Research Responsibility (<http://research.unl.edu/researchresponsibility/forms>).

Approval must be secured prior to the initiation of the research; the IRB and IACUC will not review projects already in progress. Evidence of IRB/IACUC approval must be submitted at the time the final dissertation is filed.

Supervisory Committee

Committee Requirements

A Supervisory Committee is established **before a doctoral student has accumulated 45 credit hours**, including any transfer hours but excluding research or language tools, to assure that students are under careful advisement and mentoring throughout their careers.

The Supervisory Committee is appointed by the Dean for Graduate Studies based on a recommendation of the departmental Graduate Committee in the student's major, prior to the approval of the program of study.

The Supervisory Committee consists of at least four resident Graduate Faculty (<https://catalog.unl.edu/graduate-professional/graduate/faculty>) members.

- All committee members must be either Graduate Faculty or Graduate Faculty Associates approved to perform specified Graduate Faculty duties.
- The committee must include at least one Graduate Faculty member external to the academic department or program in which the degree is to be granted but within the University of Nebraska system. If the student is pursuing a minor, the Graduate Faculty member from the minor department may serve as the outside representative.

Member Roles

An **Appointment of Supervisory Committee form**, signed by the Graduate Committee Chair, should be filed with Graduate Studies as described in the Doctoral Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral>).

- **Chair:** The Chair of a doctoral student's committee serves as the advisor and mentor of the student. The Chair may not serve as the Outside Representative or a designated reader.
- **Member:** All members of the committee vote to allow the student into candidacy, request an extension and determine the outcome of the student's dissertation defense. Members may serve as the reader or outside representative.
- **Reader:** Two members of the committee are designated as readers. They and the Chair read the draft(s) of the dissertation to determine whether the student is ready to defend. They sign the *Application for Final Oral* if the student is approved to move forward with the defense. Special members may serve as readers.
- **Outside Representative:** One member must be external to the student's major program but within the University of Nebraska

system. If the student is seeking a minor, the faculty member representing the student's minor may serve as the Outside Representative. He or she may serve as a reader on the student's committee.

- **Special Member:** A faculty member from another institution outside the University of Nebraska system may serve as a fifth committee member on the student's committee. Special members may serve as readers and have voting rights for the student's committee. Only one special member may serve per committee. A special member may not serve as outside representative.

Changes to the Committee

Changes may be made to a Supervisory Committee any time prior to the submission of the Application for Final Oral Exam using a change request form as described in the Doctoral Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral>).

If the Supervisory Committee **chair** leaves the employ of the University, or retires or is otherwise unable to serve on the Committee, Graduate Studies must be notified immediately and a change in the Committee made as follows:

- If the student has achieved Candidacy, the former chair who has left may continue to serve as co-chair of the Supervisory Committee, with approval of the departmental Graduate Committee and the Dean for Graduate Studies. A second co-chair must be appointed who is a resident Graduate Faculty member.
- If the student has not achieved Candidacy, a new chair of the Supervisory Committee who is a resident Graduate Faculty member must be appointed immediately, with the agreement of the departmental/school Graduate Program Committee and the Dean for Graduate Studies.

If a **member other than the chair** leaves the employ of the University or retires, a replacement should be appointed who is a resident graduate faculty member. When continuing expertise is needed and the faculty member is willing to continue serving, he/she may continue as a member of the Supervisory Committee, with the approval of the Supervisory Committee Chair and the concurrence of the Dean for Graduate Studies.

Graduate faculty with **emeritus status** may co-chair the supervisory committees of doctoral students with a resident graduate faculty member and may continue to serve as members of committees, with approval of the graduate committee chair.

Program of Studies

Program Requirements

The Program of Studies must be filed in Graduate Studies prior to completion of half the coursework for the doctoral program.

- At least half of the graduate work, including the dissertation, will be completed in the student's major.
- It must contain sufficient credit hours:
 - PhD: At least 90 credit hours, including 12 to 55 hours of dissertation research.
 - EdD: At least 96 credit hours, including 6 hours of research tools and 12 to 55 hours of dissertation research.
 - DMA: At least 90 credit hours, including a minimum of 3 hours doctoral document research.
 - AuD: At least 89 credit hours.

- It must include any departmental language or research tool requirements.
- It must be filed within the same semester as the appointment of the Supervisory Committee.
- The time limit on granting the doctoral degree is eight years from the time of filing the student's Program of Studies in Graduate Studies.

Any subsequent change in the program is approved by the Supervisory Committee and the action reported to Graduate Studies in writing.

The Supervisory Committee will determine what course work taken prior to filing of a Program of Studies, including hours earned toward the master's degree(s), will be accepted as part of the program's 89-96 hours.

- The Supervisory Committee is not obligated to reduce the doctoral Program of Studies by applying course work completed prior to its appointment.
- Prior course work is assessed in relation to its contribution to framing a research foundation for the degree. Each course accepted must be current and relevant in relation to the desired degree.
- No graduate credit will be accepted from a previously awarded doctoral degree at any institution, including UNL.

Language and Tools

There is no uniform language or research tool requirement for UNL Graduate Studies. Students should contact their Graduate Chair for specific departmental requirements.

All required language or research tools requirements for the student's program should be listed on the Program of Studies by the Supervisory Committee and be satisfied prior to filing the Application for Admission to Candidacy, which is due at least seven months before the scheduled final oral examination.

Interdisciplinary Program

An Individualized Interdisciplinary Doctoral (IID) program of studies is designed for students who wish to tailor a program to meet their professional interests and research endeavors across programs. A student in an IID program may select a field of study that integrates material offered in two or more departments without meeting the specific major requirements of one program.

Although an IID program allows a high degree of flexibility, it requires the approval of Graduate Studies as well as the participating academic units. It is not an alternative for students who cannot gain admission to other programs. Also, it is not a mechanism for offering the PhD degree within units which do not have their own authorized PhD programs; an IID program may be developed only with programs which offer a doctoral degree.

For information on developing an IID Program of Studies, contact the Doctoral Specialist (<http://www.unl.edu/gradstudies/current/degrees/doctoral>) in Graduate Studies.

Academic Residency

Academic residency requires the doctoral student to enroll in a specified number of hours related to the degree within a specific timeframe. This ensures that each doctoral program is reasonably compact, continuous, and cohesive, and that a substantial portion is done under close supervision by the University. No additional hours over and above those for the required program of studies will be needed to fulfill academic residency.

For a student beginning a doctoral program:

- With a **bachelor's degree**: The requirement is 27 hours of graduate work within a consecutive 18-month period, and 15 of these 27 hours must be taken after receiving a master's along the way or completing 30 hours.
- With a **master's degree**: The requirement is 27 hours of graduate work within a consecutive 18-month period.
- As **University staff or a person employed full-time in their major field**: The requirement is 24 credit hours of graduate work within a consecutive two-year period, and 12 of these 24 hours must be taken after receiving a master's along the way or completing 30 hours. For registration restrictions, refer to University Staff Exemption (<http://nebraska.edu/faculty-and-staff/benefits/employee-and-dependent-scholarships.html>).

The academic residency requirement must be met **prior to the scheduling of the final oral exam**.

In exceptional circumstances, where it is clear that the purpose of residency will be fulfilled although the above formal conditions are not met, the student's Supervisory Committee may, with the approval of the Dean for Graduate Studies, designate an alternative procedure for satisfying the residency requirements.

Comprehensive Examination

When a student has substantially completed studies in the doctoral program, the student must pass a written comprehensive examination in the major and minor fields of study.

Requirement and Scheduling

The Supervisory Committee arranges for comprehensive examinations — written and potentially also oral — at least seven months prior to the final oral examination (defense).

- The **written** comprehensive examination is an investigation of the student's breadth of understanding of the field of knowledge of which his/her special subject is a part. It is not a repetition of course examinations.
- An **oral** comprehensive examination may be required at the discretion of the Supervisory Committee. The oral exam may include the minor or related fields in addition to the major field of study. If an oral exam is required, it is part of the comprehensive exam requirements to be met before candidacy.

Examination Results

Upon successful completion of comprehensive exams, an **Application for Candidacy** should be filed as described in Doctoral Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral/#candidacy>).

Otherwise, if the Supervisory Committee determines that the student has failed the comprehensive examination:

1. A letter is submitted by the chair of the Supervisory Committee to the Dean for Graduate Studies stating the conditions under which the student may attempt another examination.
2. Only one attempt may be made per academic term. Only two attempts overall are permitted, unless additional attempts are approved by the Supervisory Committee.

Candidacy

The Supervisory Committee files the **Application for Admission to Candidacy** as described in Doctoral Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral>) once the student has:

- Met any provisional admission requirements
- Satisfied language and research tool requirements
- Passed the comprehensive examination(s)

This form must be filed in Graduate Studies at least seven months prior to the final oral examination (defense).

Continuous Registration

Once candidacy is achieved, the student must register for **at least one credit hour each fall and spring** until they graduate, even after meeting the total dissertation hours on their Program.

- **Failure to register will result in termination of candidacy and program.**
- Academic Leave (p. 498) can, for eligible students, provide an exception to the continuous registration requirement.
- Candidates do not need to register for **summer** unless required by their department during an assistantship, for a student visa, to defer student loans, or for Health Center access.

Credit Hours

Doctoral candidates may need to register for additional hours due to the following factors.

- To be exempted from withholding for FICA (Social Security) and Medicare, candidates being paid as graduate assistants must either have full-time status or register for 4 cr each term.
- Campus Services/Facilities: Graduate students registered for at least 1 cr per term are able to access the University Health Center (<http://health.unl.edu>), University Libraries (<http://libraries.unl.edu>), and Campus Recreation Center (<http://crec.unl.edu>). Additional charges may be incurred based on use.
- Health Insurance (<http://www.unl.edu/gradstudies/current/health>): All UNL students enrolled in at least 6 cr or full-time certified are eligible to purchase this plan. Graduate assistants and international students are automatically enrolled in health insurance.
- Eligibility for financial aid (<http://financialaid.unl.edu/eligibility.shtml>) typically requires enrollment of 4 cr per fall or spring. It also involves the fraction of attempted credit hours completed successfully (<http://financialaid.unl.edu/sap.shtml>) and whether the student has exceeded a maximum number of credit hours allowed for a degree objective.

Full-Time Status

Full-time status normally requires 9 cr each fall and spring. However, Candidates enrolling in at least 1 credit hour per term can be classified as full-time if they request and are approved for Certification of Full-Time Status (<http://research.unl.edu/gradstudies/fulltime>) before each term.

Doctoral students may use full-time certification for a maximum of two consecutive years. To maintain full-time status beyond that, a candidate must again register for at least 9 cr each fall/spring.

Tuition and Fees

Retaining Resident Rate: Candidates who were classified as Nebraska residents for tuition purposes and relocate out of the state while maintaining continuous enrollment remain eligible for resident tuition.

All But Dissertation (ABD): Students who have completed all courses on the Program and who are registering for dissertation (999) hours in excess of the requirements of the Program to maintain continuous registration are eligible for a waiver of the non-resident portion of tuition. To qualify for this benefit, students must (1) have grades for all courses on the Program of Studies except for dissertation (999) hours and (2) send email to the Doctoral Specialist (<http://www.unl.edu/gradstudies/current/degrees/doctoral>) requesting this benefit. Once approved, this status remains in effect until the student graduates.

Dissertation and Final Oral Exam

Dissertation Requirements

The **dissertation** is of no fixed length. Students work with their advisor and/or Supervisory Committee to determine the subject of the dissertation.

The **dissertation abstract** may not exceed 350 words in length.

See Preparing a Dissertation (<http://www.unl.edu/gradstudies/current/degrees/guidelines>) for formatting required by Graduate Studies. Style guidelines are determined by the student's specific discipline.

Reading Committee

Following approval by the major advisor, the dissertation and abstract should be presented to the Reading Committee for review at least four weeks prior to the oral examination. The Reading Committee consists of two members from the Supervisory Committee, excluding the Chair or Co-chair.

An Application for Final Oral Exam (<http://www.unl.edu/gradstudies/current/degrees/doctoral/#examform>) is due in Graduate Studies at least two weeks prior to the scheduled defense, indicating that the committee chair(s) and the readers have read the dissertation, find it suitable for a defense, and grant permission for the defense to be held. All committee members should be given sufficient time to read the dissertation prior to the defense.

If only one member of the Reading Committee dissents, the dissertation defense or oral exam may proceed upon written recommendation by the supervisory committee, accompanying the Application for Final Oral Exam.

Final Oral Examination

Preparation

Once the candidate's dissertation has been reviewed and approved by the Reading Committee and Supervisory Committee Chair(s), a final oral examination may be scheduled.

The final oral examination must be scheduled for a date when a majority of the Supervisory Committee, including the Chair(s), are available for the examination. Exceptions may be made only by permission of the Dean for Graduate Studies.

Examination

The final examination for the doctoral degree is oral and open to the University community and the public.

- The Supervisory Committee determines the defense's character and length. The examination may be devoted to the special field of the dissertation or to the Candidate's general knowledge, or it may be designed to test judgment and critical powers.
- All persons may be present during the dissertation presentation and general questioning. However, this is followed by a closed questioning portion of the examination for which all persons except the Candidate, Supervisory Committee, and invited faculty must be excused.
- The final oral examination over the dissertation may be waived only with the consent of the Dean for Graduate Studies.

Results

The Supervisory Committee reports the results of the final oral examination to Graduate Studies.

1. If the committee agrees unanimously that the student has passed: A Report of Completion (<http://www.unl.edu/gradstudies/current/degrees/doctoral/#oralexam>) is signed by all committee members present for the defense.
2. If only one member dissents: The dissenting member files a letter of explanation in Graduate Studies, but the student is approved for the degree and a Report of Completion is signed accordingly.
3. If more than one member dissents: The student fails to pass the final oral exam. The committee files a report on the failure in Graduate Studies, indicating what the student must do before attempting another examination. A student may attempt a final oral exam only once per term.

Depositing

Following the successful completion of the oral examination, the student should complete the remaining Doctoral Milestones (<http://www.unl.edu/gradstudies/current/degrees/doctoral/#oralexam>).

Only abstracts and dissertations that meet all published requirements can be approved and stamped for depositing.

Depositing also involves payment of a processing fee and, if applicable, a fee to register a copyright.

Master's Degrees

Graduate Studies

Master's Programs Offered

See Programs Offered (<http://www.unl.edu/gradstudies/prospective/programs/colleges>) for a current list of degrees and majors, Majors, Minors, and More (p. 503) for related policy, and the Graduate School Glossary (<http://www.unl.edu/gradstudies/glossary/#degrees>) for a better understanding of the different degrees.

UNL's professional master's programs — e.g., MArch, LLM — are not overseen by Graduate Studies or covered by Graduate Studies policy.

Core Requirements

A student progresses toward a master's degree by completing the sequence of Master's Degree Milestones (<http://www.unl.edu/gradstudies/current/degrees/masters>) before their posted deadlines and while following these policies:

For All Master's Degrees

The **Memorandum of Courses** is filed before the halfway point — before grades (letter grades, no reports, or Incompletes) have been received in more than one half of the courses listed on the Memorandum — and on recommendation of the major and minor departments and approval of Graduate Studies.

- A student may NOT file a Memorandum and graduate in the same term.
- Students have **ten years** from the oldest course listed on the Memorandum to complete the degree. Courses exceeding this limit may not be used toward a master's degree.

A student is admitted to **Candidacy** for the master's degree when **admission deficiencies** have been removed and the Memorandum of Courses has been filed.

The student must **apply to graduate**.

The **Final Examination Report** is due in Graduate Studies at least four weeks (three weeks in summer) before the final exam, if required, but in no case later than four weeks before the final date for oral exams. The report will be accepted after all courses on the Memorandum have been completed or are in progress, and any Incompletes have been removed.

- **Written examinations** in major and minor fields, if required, must be passed at least one week prior to the oral exam.
- An **oral examination**, if required, is administered by the examining committee.
- See Examinations for the Master's Degree (p. 509) for full policy.

Additional For Option I (Thesis)

The **subject** of the thesis must be approved by the departmental Graduate Committee, and the thesis must conform in **style and form** to the guidelines in Preparing a Thesis or Dissertation (<http://www.unl.edu/gradstudies/current/degrees/guidelines>).

The **preliminary thesis and abstract** must be approved prior to the oral exam.

- A Candidate is eligible to apply for the final oral exam or its waiver only after the completed thesis is **approved by the advisor**.
- An electronic copy of the thesis is due in **Graduate Studies** at least two weeks (one week in summer) prior to the oral exam, or if the oral exam is waived, no later than two weeks before the final date for oral exams.
- The thesis must be presented to the **examining committee** at least two weeks prior to the oral exam.

After successful completion of the oral exam, the **finalized thesis** is due in Graduate Studies for **final approval** prior to **upload and deposit**.

Research Responsibility

All research involving human or animal subjects must receive approval from the Institutional Review Board (IRB) and/or the Institutional Animal Care and Use Committee (IACUC). The IRB New Protocol Submission form is completed online via NUGrant (<http://nugrant.unl.edu>); the Application to Use Animals is available from the Office of Research Responsibility (<http://research.unl.edu/researchresponsibility/forms>).

Approval must be secured prior to the initiation of the research; the IRB and IACUC will not review projects already in progress. Evidence of IRB/IACUC approval must be submitted at the time the final thesis is filed.

Thesis and Non-Thesis: Options I, II, and III

The NU Graduate College offers master's degrees under **three Options**, except in a few departments where such a choice is not feasible.

For All Options

- No courses older than **10 years** will apply toward master's degree requirements at UNL.
- A written or oral **comprehensive examination** is required.
- Courses open only to graduate students are those numbered at the 900 level, or at the 800 level without counterparts at the 400 level or below.

Option I

- Minimum **30 cr**, including 20-24 cr of regular coursework.
- **Thesis required**, equivalent to 6-10 cr. At least half of the required work, including thesis, must be in one major subject.
- Minor optional, at least 9 cr.
- 8 cr, in addition to the thesis, must be in graduate-only courses.

Option II

- Minimum **36 cr**, a major and one or two minors.
- **No thesis** required.
- Minor required, at least 9 cr.
- At least 12 of the 36 cr must be in graduate-only courses.

MEd is only available as Option II.

Option III

- Minimum **36 cr**.
- **No thesis** required.
- **No minor** available.
- At least 18 of the 36 cr must be in graduate-only courses.

Accountancy MPA is only available as Option III; its students must earn at least 20 cr in graduate-only courses and at least 15 cr of those must be in Accountancy.

Change of Option

Students may change their declared Option at any time during the program of study with written approval from the advisor, the Chair of the Graduate Committee in the student's major, and the Dean for Graduate Studies. **The only exception to this policy is that students may not change from Option I to any other Option if certification of full-time status has been utilized.**

Comprehensive Examinations

Examination Requirement

All master's students are required to complete a **comprehensive examination – written and/or oral** as required by the appropriate academic departments.

- The **written exam**, if required, must be completed within **24 months** prior to the date of graduation.

- When an **oral examination** is required, the **examining committee** will consist of at least **three members** representing the major department and the minor department (if applicable), recommended by the major department and approved by Graduate Studies.
 - All professors on the examining committee must have Graduate Faculty status – full or Associate.
 - If a committee member **leaves the employ of the University or retires**, a replacement should be appointed. When continuing expertise is needed and the faculty member is willing to continue serving, the departing faculty member may remain as a member or co-chair of the committee, with approval of the department Graduate Committee and Graduate Studies.

For an **Option I** student's oral examination to be waived, the student must have completed a written examination within the 24 month time requirement, and the thesis must be approved in writing by a Graduate Faculty member in addition to the major advisor.

When the program includes a **minor**, the comprehensive examination in the minor field(s) (written and/or oral) may be waived subject to the approval of the minor department(s) provided all grades in the minor are at least a B or pass.

Examination Results

Upon **successful completion** of the examination(s), the student proceeds with steps outlined in the Master's Degree Milestones (<http://www.unl.edu/gradstudies/current/degrees/masters>).

- When the examining committee's "pass" decision is **not unanimous** but only one examiner dissents, the student is to be approved for the degree. The dissenting member files a letter of explanation in Graduate Studies.
- If a student **fails to pass** the final oral or written examination, the committee files a report on the failure in Graduate Studies and indicates what the student must do before taking another examination. Another examination may not be held during the same term.

Educational Specialist Degree

Graduate Studies

A student progresses toward the Ed.S. degree by completing the sequence of Ed.S. Milestones (<http://www.unl.edu/gradstudies/current/degrees/specialist>) before their posted deadlines and while following these policies:

The **Supervisory Committee** is established prior to completion of 42 credit hours of the Ed.S. program's required coursework. A Supervisory Committee consisting of three graduate faculty is appointed with approval by the department's Graduate Committee Chair.

The **Program of Studies** is filed prior to completion of 42 credit hours of the Ed.S. program's required coursework.

- A minimum of **66 credit hours** beyond the baccalaureate degree is required for the Ed.S. The student must complete **at least 24 credit hours after approval of the Program**.
- While specific requirements are determined by departments, in general 40 to 50 hours will be in core courses within the unit or closely related units, 3 hours or more will be research, 6 hours or more will be practicum, and 6 or more hours will be electives.

- The time limit on granting the Ed.S. degree is **six years** from the time of filing the Program in Graduate Studies.

A written **Comprehensive Examination**, developed by the Supervisory Committee, is administered when the program is substantially complete. The committee determines the nature and duration of the examinations.

Once the student has met all requirements for the Ed.S. degree, a **Final Report Form** is signed by all Supervisory Committee members and submitted to Graduate Studies.

Certificate Programs

Graduate Studies

Graduate Certificates

Graduate certificate programs are designed for post-baccalaureate, graduate, or post-graduate students. See Programs: Graduate Certificates (p. 4) for course requirements and links to application instructions. A graduate certificate typically requires at least 12-15 credit hours of work past the bachelor's degree, but no more than 20 hours.

After completing the prescribed set of coursework, students receive a graduate certificate rather than a degree. Completion of the certificate is indicated on the UNL graduate transcript.

Graduate certificate programs may function independently of degree programs. Hours earned in certificate programs may be applied to a degree program (p. 500).

State Certifications for Educators

Educator certifications — in particular, the Teaching Certificate (initial or renewal), Administrative Certificate (initial or renewal), and various endorsements — are granted by the State of Nebraska's Department of Education (<http://www.education.ne.gov/TCERT>) rather than by UNL.

For more information refer to Programs: Teacher Certification (p. 12) or consult UNL's certification officer (<http://cehs.unl.edu/cehs/renewing-your-teaching-certification>).

Educational Administration and Supervision

The Department of Educational Administration offers a graduate-level administrator preparation program leading to a Certificate of Specialization in Educational Administration and Supervision (EDAS-SXCT). The minimum requirement is 66 semester credit hours, in a Program of Studies specified by the Department.

Requirements for the student:

1. Apply for admission as indicated for Educational Administration (<http://www.unl.edu/gradstudies/prospective/programs/EducationalAdministration>), get and accept an offer of admission to the program, and enroll.
2. Complete certificate requirements within six consecutive calendar years of acceptance into the program. At the time of completion, none of the credit hours approved may be more than ten years old, except for hours earned in a previous degree program.
3. Apply for graduation via MyRED. Once all requirements are complete, the department will notify Graduate Studies so the student may receive the certificate through Graduation Services.

Probation and Termination

Graduate Studies

Grounds

For all graduate students at UNL, probation or termination recommendations may be made under the following conditions:

- Failure to make academic progress as defined in the program's graduate student handbook
- Violations of the Student Code of Conduct (<http://stuafs.unl.edu/dos/code>)
- Failure to satisfy Scholastic Grade Requirements (p. 499)
- Failure in qualifying examinations, preliminary examinations, comprehensive examinations or final degree examinations
- Failure to master the methodology and content of one's field in a manner that is sufficient to complete a successful thesis or dissertation
- In fields leading to licensure or certification, ethical misconduct or lack of professional promise in the professional field
- Failure to satisfy conditions required for removal of probationary status or provisional admission

Graduate Committees employing additional conditions for probation or termination must specify these conditions in writing and inform all students affected by these conditions.

Process

How It Happens

Graduate students who do not maintain satisfactory progress may be placed on probation, terminated from a degree program, and/or denied permission to continue graduate studies in the University.

1. Probation or termination is initiated when the student's advisor or supervisory committee submits a recommendation to the departmental Graduate Committee.
2. If the Graduate Committee approves a recommendation for termination, the graduate chair must communicate it in writing to the Dean for Graduate Studies and the student.

After Termination or Dismissal

Students **dismissed from the University** due to violations of the Student Code of Conduct are ineligible to reapply for graduate study at UNL.

Students whose UNL **graduate program has been terminated** may apply for admission to another degree program or admission as a non-degree seeking student only with the approval of the Dean for Graduate Studies.

Termination Appeals

Standard Appeal Procedure

In all cases, appeals are made **in writing** to the appropriate advisor, committee, or council.

1. The initial appeal is to the student's **advisor**.
2. *Doctoral students with an established supervisory committee:* If denied, the appeal may be submitted to the student's **supervisory committee**.
3. If denied, the appeal may be submitted to the departmental or interdepartmental area **Graduate Committee** administratively responsible for the student's graduate program.

- If denied, an appeal may be made to the campus **Graduate Council** as described below. Normally this is the final appeals body; for exceptions see NU Executive Graduate Council section below.

When the appeal concerns graduate-level **qualifying examinations, comprehensive examinations, or final examinations**, the student is responsible for making reasonable efforts to ascertain the results of the examination within **30 days** after its completion, and the student's written initiation of the appeal must be filed within **30 days** following the student's receipt of notification of the evaluation.

When the appeal concerns a **termination of program**, the student's written initiation of the appeal must be filed within **30 days** following the student's receipt of the official written notification by Graduate Studies.

Graduate Council As Appeal Board

- When a student's graduate program consists of registration **essentially or entirely on one campus**, the Graduate Council of the campus administratively responsible for the program will constitute the appeal board.
- When a student's graduate program includes substantial registrations **on a campus other than the one administratively responsible** for the program, three members of the Graduate Council for the other campus will be designated by the Dean for Graduate Studies on that campus to augment the Graduate Council on the campus administratively responsible for the program. In this case, the augmented Council will constitute the appeal board. The decision concerning augmentation of a campus Graduate Council for a specific appeal involving registrations on a campus other than the one administratively responsible for the student's program will be made by the Deans for Graduate Studies on the campuses involved.

Appeal to the NU Executive Graduate Council

- There is no absolute right of appeal to the Executive Graduate Council. The Executive Graduate Council will accept appeals only in those cases where in the exercise of its sole discretion it shall first find that one or more of the following grounds for accepting the appeal exist:
 - That the campus Graduate Council has violated some element of fair procedure (i.e., has failed to allow the parties concerned to present their cases fully to their campus Graduate Council);
 - That the campus Graduate Council has failed to examine or give adequate weight to important evidence relevant to one party's position;
 - That the campus Graduate Council has given undue weight to evidence not pertinent to the case; or
 - That some gross miscarriage of justice would be perpetrated if the decision of the campus Graduate Council is allowed to stand.

A decision by the Executive Graduate Council not to accept jurisdiction of an appeal shall be final and is not subject to further appeal.

- Appeals to the Executive Graduate Council must be made in writing and must specifically outline the grounds for the appeal. Such appeal must be made within 20 working days of the day the decision of the campus Graduate Council is received (working days shall not include those days the University is not in session).
- The Executive Graduate Council must make a decision to hear the appeal or not to hear the appeal within 30 working days after receipt of the appeal. Acceptance or denial of jurisdiction over the appeal will be made in writing.

- The decision of the Executive Graduate Council on the merits of the case will be made and transmitted to the concerned parties within 40 working days after the decision to hear the appeal.
- No person who was a member of the department or campus Graduate Council involved in the case will be eligible to participate in the decisions of the Executive Graduate Council either to decide whether the case should be heard or to decide the merits of the case. However, the Dean for Graduate Studies may replace members of the Executive Graduate Council not eligible for participation in the decision to hear the appeal or in the appeal itself.

Funding

Graduate Studies

Funding for graduate study is primarily in the form of assistantships (p. 511) and fellowships (p. 513). Additionally, the Office of Scholarships and Financial Aid maintains information on other forms of financial support such as loans and need-based funding (p. 513).

Assistantships

Graduate Studies

Intro

A graduate assistantship provides financial support for a graduate student for a set period of time during which the student is expected to pursue activities towards the advanced degree.

Time Required

Work required by an assistantship and not directly related to the student's degree program cannot exceed **13-19.6 hours per week (.33 to .49 FTE)**.

Although students on graduate assistantships may not have employment exceeding 19.6 hours per week from all sources both on and off campus during the period of the assistantship, there is no limit to time spent on studies and research relating to the advanced degree.

Because of the potential for exploitation of graduate students, any assignment of responsibilities, such as teaching a course, must be associated with a fair and reasonable compensation. Graduate students may not volunteer for any significant service to the department without an appropriate stipend.

Types of Assistantships

In each case, the student is expected to continue working towards the advanced degree while a graduate assistant.

- A **teaching assistantship** provides a stipend to a student who is typically assisting in an academic department's teaching program, i.e., grading, assisting a professor with a course, etc.
- A **research assistantship** provides a stipend to a student who is typically assisting a professor with a research project, enabling the graduate student to work towards an advanced degree.
- Other graduate assistantships** provide a stipend to a student who is assisting an academic or nonacademic department with a wide variety of functions.

Eligibility

To hold a graduate assistantship a student must be admitted for a specific graduate degree objective and enrolled for credit during the tenure of the assistantship.

Individual departments make assistantship appointments. Students who wish to be considered for assistantships in their major should direct inquiries to the graduate chair of their department. All **international** graduate students who are to be teaching assistants at UNL must attend the Institute for International Teaching Assistants (<http://www.unl.edu/gradstudies/current/ita>).

Benefits

Benefits Offered

Tuition remission of up to 12 hours per semester is provided as a benefit of eligible assistantships. Students holding eligible assistantships are provided basic individual **student health insurance** coverage with related benefits. The University subsidizes part of the student health insurance (<http://www.unl.edu/gradstudies/current/health>) premium for eligible graduate assistants.

Within departments and within each level of differentiation (master's or doctoral, new or experienced, number of work hours), stipends should generally be equivalent. Guidelines used to determine stipend levels should be available to students through the department.

Assistants may be given **@unl.edu email addresses**; those accounts close at the end of the assistantship.

Eligibility For Benefits

Eligibility for assistantship benefits requires meeting all of the following criteria:

- A continuous appointment for four full months within the semester dates.
- The stipend meets the minimum salary level set by the University.
- The assistantship or combination of assistantships in one or more departments totals at least 13.33 hours per week employment.

Resignation or Termination

If a graduate assistant resigns or their assistantship is terminated during the semester **before four full months** of consecutive service (e.g., 120 consecutive days within the semester dates, August-December or January-May) **all benefits will be lost** and the student will be responsible for the total tuition payment and health insurance premiums.

Summer Tuition

If a graduate assistant, while on an appointment during both semesters of the preceding academic year, was paid a stipend meeting the **minimum qualification** for summer tuition, the student is not charged tuition for the first 6 hours during the summer sessions. If such a stipend met the **next level of qualification**, the student is not charged tuition for the first 12 hours during the summer sessions. (Specific dollar amounts are available each year in the Guidelines for Graduate Assistantships (<http://www.unl.edu/gradstudies/facstaff/funding>).)

Non-Benefits-Eligible Assistantships

A student on a non-benefits-eligible graduate assistantship is charged tuition at resident rates if the stipend received is equal to, or greater than,

the total of the amount set by the University for the relative summer session.

Hiring and Renewal

The responsibilities of the graduate assistant and the method by which the student will be evaluated should be provided in writing to the student by the immediate supervisor at the beginning of the assistantship.

General Responsibilities

Each department or unit shall establish its own documented procedures for recruitment, selection, retention and dismissal of graduate assistants in accordance with UNL graduate policy and Affirmative Action/Equal Opportunity guidelines. These procedures shall be made available to each graduate student and posted in the department. Individual departments may establish a required minimum course load (p. 501) for funded students.

Departments must provide students with an official signed offer letter (<http://www.unl.edu/gradstudies/facstaff/funding>), informing them of assistantship expectations, responsibilities, and compensation. A graduate assistant's duties are assigned by the departmental chair/head, graduate committee chair, administrative supervisor, or others.

Graduate assistants are expected to be assigned relevant professional work that may include, among other tasks:

- teaching or assisting in a course (under the supervision of a director or mentor)
- grading for a course
- working in a department-sponsored laboratory or instructional center
- assisting a professor on a research project, professional conference development, tutoring, or development of administrative skills

No graduate assistant should be assigned to a project which is primarily clerical or housekeeping. A portion of any project may have clerical elements, but all projects should incorporate decision-making, judgment, analysis and evaluation skills. All projects must be supervised by a member of the graduate faculty or administrative staff.

Renewal and Performance Evaluation

Assistantships without a fixed term specified in the initial letter of offer may, at the discretion of the department, be renewed if the following criteria are met:

1. Funding is available.
2. The student is making satisfactory academic progress.
3. The student's assistantship performance is judged to be satisfactory by his or her supervisor.

Where the number of years of funding is within those specified in the initial letter of offer, an assistantship must be renewed if these three criteria are met.

The faculty member or staff person who supervises the assistant's work should conduct a timely written evaluation of the student's performance (<http://www.unl.edu/gradstudies/facstaff/funding/#eval>) and provide a copy of that evaluation to the student and to the chair/director for placement in the student's file.

Evaluations of performance shall not be influenced on the basis of sex, age, disability, race, color, religion, marital status, veteran's status, national or ethnic origin, or sexual orientation, nor shall they be

influenced by students' exercise of their First Amendment freedoms of expression and association.

Academic Freedom of GTAs

The academic freedom of graduate teaching assistants (GTAs) is not necessarily coextensive with that of faculty. All GTAs are engaged in supervised teaching or instruction. Supervisors are responsible for defining the nature, scope and manner of instruction to be used for each course. Supervisors should communicate the extent to which GTAs have discretion to introduce additional material. Graduate teaching assistants should follow the instructions of the supervisor. Graduate teaching assistants may not be penalized for expressing their own views on matters within the scope of the course, provided they adequately represent these views as their own.

In interpreting teaching evaluations, supervisors shall make every effort to distinguish legitimate critiques of the course from negative evaluations due to

- a. prejudice against the GTA on the basis of race, sex, sexual orientation, religion or other protected status, or
- b. disagreement with viewpoints expressed by the GTA or by students in the class.

Fellowships

Graduate Studies

Fellowships are awarded on a competitive basis in recognition of a student's demonstrated scholarship, scholastic and creative promise, and/or financial need. There is no service or work requirement associated with fellowship awards. A student holding a fellowship or a traineeship must be a full-time student during the period of appointment.

See also: fellowships for current students (<http://www.unl.edu/gradstudies/current/funding/fellowships>).

Eligibility

To be eligible for a fellowship a student must be admitted to a department or area with a specific graduate degree objective and enrolled in graduate academic coursework.

- Students enrolled in certificate-only programs with no degree objective are ineligible.
- International students must have completed one year of study at a US institution of higher education to be eligible.
- Employees of the University of Nebraska, other than graduate assistants, are ineligible.

Types of Fellowships

Tuition Fellowships remit tuition for the full or partial cost of graduate courses according to the specific fellowship guidelines for the term of the award. Recipients of tuition fellowships are responsible for university program and facilities fees unless specifically included in the award announcement. Recipients must be admitted to a graduate program with a specific graduate degree objective.

Full Support Fellowships from Graduate Studies (Presidential and Fling Fellowships) provide stipend payments for recipients of these awards. Fellowship recipients are required to be full-time students (at least 9 credit hours or full-time certification) during the period of

appointment and may hold another major fellowship. They may not engage in remunerative employment, including a graduate assistantship or traineeship.

Partial Support Fellowships allow students to hold other fellowships and assistantships.

External Fellowships such as those from NSF-GRFP, AAUW, or the Smithsonian are not awarded by UNL but recipients should notify the Fellowship Specialist in Graduate Studies.

Continuation

Continuation of graduate fellowships may be denied to recipients under any of the following conditions:

- Failure to satisfy Scholastic Grade Requirements (p. 499).
- Violations of the Code of Conduct (p. 490).
- Failure in qualifying examinations, preliminary examinations, comprehensive examinations or failure to make satisfactory progress as defined by the graduate program.

Assistantship Impact

Fellowship awards cannot have any impact on the amount of a graduate assistantship stipend unless there is an accompanying decrease in the teaching or research assignment and the corresponding FTE.

Loans and Need-Based Funding

Graduate Studies

Scholarships and Financial Aid

The Office of Scholarships and Financial Aid (OSFA) (<http://www.unl.edu/scholf>) does not participate in the granting of fellowships or assistantships but does maintain current information on **other forms of financial support** available to students.

FAFSA

To apply for Federal Work-Study, Federal Perkins Loans, Federal Stafford Loans, or Unsubsidized Federal Stafford Loans, students submit a Free Application for Federal Student Aid (FAFSA) as **early** as possible.

Federal Perkins Loans and Federal Work-Study are awarded on a **first-come, first-serve basis to domestic students** with a completed financial aid file as long as funds are available. *International students are ineligible to apply for federal loans.*

To have a completed file, a student must:

1. Submit a FAFSA.
2. Be admitted to a degree program (contact OSFA for exceptions).
3. If coming to UNL as a transfer student or after attending another postsecondary school as an undergraduate, submit a financial aid transcript to OSFA from all schools attended. A financial aid transcript is required even if you did not receive financial aid.
4. Submit all documentation requested by OSFA as required for verification.

Satisfactory Progress

Satisfactory progress toward a degree is a requirement for receiving financial aid. Maintaining satisfactory progress requires:

1. successful completion of a minimum number of hours and
2. completion of the degree prior to reaching the maximum credit hour limit.

For details refer to the Office of Scholarships and Financial Aid: Satisfactory Academic Progress (<http://financialaid.unl.edu/sap.shtml>).

Faculty

Graduate Studies

Graduate Faculty Full Membership

The Graduate Faculty is composed of all faculty members in tenure leading positions, including pre-tenured faculty, who are automatically appointed as Graduate Faculty at the time of hire. Faculty members in non-tenure leading positions—including professors of practice, research professors and adjunct faculty—may be nominated for appointment to the Graduate Faculty. Full membership status lasts for the duration of the faculty member's appointment with the University.

The Graduate Faculty may teach graduate courses, serve on final examining committees, serve on supervisory committees, and chair supervisory committees for both masters and doctoral students. The Graduate Faculty may vote on any matter presented to the Graduate Faculty, including the election of the University's Graduate Council. They may also hold any elected office in the Graduate College. Graduate Faculty have the additional responsibility of voting on certain nominations of Graduate Faculty in their department, school or interdepartmental area program.

Procedure for Nominating Graduate Faculty

Faculty members in non-tenure leading positions may be nominated for membership to the Graduate Faculty. Nominees must meet the following criteria:

1. Hold the rank of senior lecturer, assistant professor (including practice, research and adjunct faculty) or above;
2. Hold the terminal degree normally accepted for academic employment in the discipline or its clear equivalent as determined by the Graduate Committee of the nominee's department, school or interdepartmental area;
3. Be actively involved in scholarly activity and/or graduate teaching as part of his or her regular duties; and
4. Have demonstrated clear evidence of continuing scholarly activity at the national level and potential in the discipline, beyond teaching.

Using the nomination form for graduate faculty (https://www.unl.edu/gradstudies/facstaff/Nomination_GraduateFaculty.pdf), and assuming all criteria are met, the Graduate Faculty in the relevant department will vote on the nomination. A two-thirds majority of the Graduate Faculty must support the nomination. Submit the following to the UNL Dean of Graduate Education: (1) The nomination form with signatures and (2) a letter from the graduate committee chair explaining the reasons for supporting the nomination. After campus-level review, the nomination is forwarded to the Provost and Dean of the Graduate College (for the NU system), who will either approve or defer the nomination. If approved,

the Provost/Dean formally appoints the faculty member to the Graduate Faculty.

SOURCE: Graduate College Policy Handbook (revised, June 2018)

Graduate Faculty Associates Provisional Status

Graduate Faculty "Associates" are non-tenure track faculty who are nominated and appointed to serve in a limited capacity as Graduate Faculty. The provisional status is granted for a limited term not to exceed a period of four years from the start of the individual's faculty appointment. Provisional status is not renewable after the term expires. Faculty who have provisional status can be nominated for full Graduate Faculty membership at any time.

Graduate Faculty Associates may teach graduate courses, direct master's theses, serve on or chair master's degree examining committees, and serve on doctoral supervisory committees. Associates may not chair or co-chair doctoral supervisory committees. Associates do not have a vote on the Graduate Faculty, nor can they hold any elected office in the Graduate College.

Procedure for Nominating Associates

Faculty members in non-tenure leading positions may be nominated for provisional membership to the Graduate Faculty. Nominations must meet the following criteria:

1. Nominee shall have the terminal degree and the rank of assistant professor (including practice, research and adjunct faculty) or above;
2. Nomination is submitted during the first four years of the individual's faculty appointment.

Using the nomination form for associates (https://www.unl.edu/gradstudies/facstaff/Nomination_GradFacAssoc.pdf), the nominee must be supported by a majority of the departmental or interdepartmental graduate committee. The nomination form must have the signatures of the graduate committee chair and the department chair/head. Submit the following to the UNL Dean of Graduate Education: (1) The nomination form with signatures and (2) the nominee's curriculum vitae. If approved, the Dean formally appoints the nominee to provisional membership, indicating the end date of the appointment.

SOURCES: Graduate College Policy Handbook (revised, June 2018); Graduate Council Minutes (September 24, 1996)

Graduate Faculty Emeriti

Upon recommendation of the departmental, school or interdepartmental graduate committee, retired Graduate Faculty who have been appointed to emeritus status may retain the rights and privileges associated with their Graduate Faculty status. These rights and privileges include permission to teach graduate courses, to serve as members of graduate programs, or to co-chair the supervisory committees of doctoral students with a resident Graduate Faculty member.

Procedure for Recommending Graduate Faculty Emeriti

Using the recommendation form for emeriti (https://www.unl.edu/gradstudies/facstaff/Nomination_GradFacEmeriti.pdf), an emeritus faculty member can be reappointed annually to the Graduate Faculty by recommendation of the department graduate committee. The recommendation form must have the signatures of the graduate committee chair and the department chair/head. Submit the form to the

Dean of Graduate Education. If approved, the Dean formally appoints the emeritus faculty member to a one year term on the Graduate Faculty.

SOURCE: Graduate College Policy Handbook (revised, June 2018)

Graduate Lecturers

A staff member who does not qualify for Graduate Faculty status may be recommended as a lecturer for a graduate level course. The lecturer appointment is valid only for the semester for which it is approved.

Procedure for Requesting Graduate Lecturers

Eligible staff members must hold the terminal degree normally accepted for employment in the discipline OR have achieved some extraordinary accomplishments as determined by the graduate committee of the recommending department.

Using the request form for graduate lecturers (https://www.unl.edu/gradstudies/facstaff/Nomination_GradFacLecturer.pdf), the recommendation must be endorsed by both the departmental graduate committee and the department chair/head. Submit the following to the Dean of Graduate Education for approval: (1) The nomination form with signatures and (2) the nominee's curriculum vitae.

SOURCE: Graduate Council Minutes (September 8, 1982)

Special Committee Members

Students may request the appointment of a faculty member from another institution outside the University of Nebraska system to serve on their supervisory committee. These external "special" members must hold a terminal degree appropriate to the discipline and have academic accomplishments comparable to the criteria for Graduate Faculty. Special Members are appointed as voting members of the supervisory committee and must be willing to participate in the student's doctoral program in a manner consistent with this role. The Special Member may serve as one of the two appointed readers; but may not serve as committee chair, co-chair, or outside representative.

Procedure for Requesting Special Committee Members

Special Members are appointed on an individual student committee basis; a separate nomination must be submitted for each supervisory committee on which a Special Member intends to serve. In addition, only one Special Member may serve on each supervisory committee, and the committee must include a minimum of four members of the Graduate Faculty.

Using the request form for special members (<https://www.unl.edu/gradstudies/current/Doctoral-SpecialCommitteeMember.pdf>), the nomination must be endorsed by both the supervisory committee chair and the departmental graduate committee chair. Submit the following to the Dean of Graduate Education for approval: (1) The nomination form with signatures and (2) the nominee's curriculum vitae.

SOURCE: Graduate Council Minutes (September 28, 1995; February 12, 2009)

Professional Studies Policies

Policy for professional programs has not yet migrated into this catalog. Refer to program websites instead:

- Master of Architecture (<http://architecture.unl.edu/prospective-student/professional-programs>)

- Doctor of Veterinary Medicine (<http://vetmed.unl.edu>) (with Iowa State University)
- Doctor of Plant Health (<http://dph.unl.edu>)
- See also: Law Catalog (<https://catalog.unl.edu/law>)

Archived Catalogs

2017-2018 and later years

Not yet archived.

Prior to 2017-2018

Graduate Studies Archive

Prior to 2017-2018, catalog information for Graduate Studies was published as the Graduate Bulletin. The following are available in PDF format:

- Graduate Bulletin 2016-2017 (1MB) (http://www.unl.edu/gradstudies/bulletin/UNL_GraduateBulletin_2016-2017.pdf)
- Graduate Bulletin 2015-2016 (1MB) (http://www.unl.edu/gradstudies/bulletin/UNL_GraduateBulletin_2015-2016.pdf)
- Graduate Bulletin 2014-2015 (1MB) (http://www.unl.edu/gradstudies/bulletin/UNL_GraduateBulletin_2014-2015.pdf)
- Graduate Bulletin 2013-2014 (328kb) (http://www.unl.edu/gradstudies/bulletin/UNL_GraduateBulletin_2013-2014.pdf)
- Graduate Bulletin 2012-2013 (12MB) (http://www.unl.edu/gradstudies/bulletin/UNL_GraduateBulletin_2012-2013.pdf)
- Graduate Bulletin 2011-2012 (5.6MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin1112.pdf>)
- Graduate Bulletin 2010-2011 (6.1MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin1011.pdf>)
- Graduate Bulletin 2009-2010 (6.1MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0910.pdf>)
- Graduate Bulletin 2008-2009 (2.8MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0809.pdf>) – first web-based bulletin year
- Graduate Bulletin 2007-2008 (1.2MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0708.pdf>) – final year for paper-based bulletin
- Graduate Bulletin 2005-2007 (1.5MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0507.pdf>)
- Graduate Bulletin 2002-2004 (22MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0204.pdf>)
- Graduate Bulletin 2000-2002 (16MB) (<http://www.unl.edu/gradstudies/bulletin/gradbulletin0002.pdf>)

Professional Studies Archive

Contact a professional program to inquire about availability of archived materials.

INDEX

A

Academic Leave of Absence	498
Academic Program Requirements	503
Accounting (ACCT)	22
Actuarial Science (ACTS)	26
Admission	494
Admission Categories	495
Admission into Concurrent or Combined Programs	496
Admission of Faculty and Staff	496
Admission of International Students	497
Advertising and Public Relations (ADPR)	28
Agribusiness (ABUS)	30
Agricultural Economics (AECN)	30
Agricultural Engineering (AGEN)	33
Agricultural Leadership Education & Communications (ALEC)	36
Agricultural Sciences (AGRI)	40
Agronomy (AGRO)	40
Animal Science (ASCI)	49
Anthropology (ANTH)	55
Architectural Engineering (AREN)	61
Architecture (ARCH)	66
Archived Catalogs	515
Art History and Criticism (AHIS)	72
Art Theory and Practice (ARTP)	75
Art-Ceramics (CERM)	76
Art-Drawing (DRAW)	77
Art-Graphic Design & Illustration (GRPH)	77
Art-Painting (PANT)	78
Art-Photography (PHOT)	78
Art-Printmaking (PRNT)	79
Art-Sculpture (SCLP)	79
Art-Special Topics (ARTS)	80
Art-Watercolor (WATC)	80
Assistantships	511
Astronomy (ASTR)	80

B

Biological Chemistry (BIOC)	81
Biological Sciences (BIOS)	83
Biological Systems Engineering (BSEN)	94
Biomedical Engineering (BIME)	97

Broadcasting (BRDC)	97
---------------------------	----

C

Certificate Programs	510
Chemical and Biomolecular Engineering (CHME)	99
Chemistry (CHEM)	102
Child, Youth and Family Studies (CYAF)	110
Civil Engineering (CIVE)	124
Classics (CLAS)	131
Communication Studies (COMM)	132
Community and Regional Planning (CRPL)	134
Community Development (CDEV)	137
Computer Science and Engineering (CSCE)	142
Conduct, Academic Integrity, and Related Policy	490
Construction Engineering (CONE)	151
Construction Management (CNST)	153
Courses	20
Criminology and Criminal Justice (CRIM)	156

D

Doctoral Degrees	504
------------------------	-----

E

Economics (ECON)	157
Education and Human Sciences (CEHS)	163
Education (EDUC)	163
Educational Administration (EDAD)	163
Educational Psychology (EDPS)	173
Educational Specialist Degree	509
Electrical and Computer Engineering (ECEN)	183
Engineering (ENGR)	191
Engler Agribusiness Entrepreneurship Program (EAEP)	193
English (ENGL)	194
Entomology (ENTO)	203
Entrepreneurship (ENTR)	207
Environmental Engineering (ENVE)	207
Ethnic Studies (ETHN)	208

F

Faculty	514
Fellowships	513
Finance (FINA)	209
Food Science and Technology (FDST)	211
Forensic Science (FORS)	216
French (FREN)	217

Funding 511

G

General 490

Geography (GEOG) 219

Geology (GEOL) 224

Geosciences (GEOS) 229

German (GERM) 230

Gerontology (GERO) 233

Governance 491

Grades (Including In Progress and Incomplete) 499

Graduate and Professional Catalog 4

Graduate Business Administration (GRBA) 235

Graduate Certificates 4

Graduate College (GRDC) 238

Graduate Credit 500

Graduate Studies Policies 490

Great Plains Study Program (GPSP) 239

Greek (GREK) 239

Guidelines for Good Practice in Graduate Education 491

H

Hebrew (HEBR) 239

History (HIST) 239

Horticulture (HORT) 248

Hospitality, Restaurant and Tourism Management (HRTM) 254

Human Sciences (HUMS) 255

I

Industrial and Management Systems Engineering (IMSE) 256

Integrative Biomedical Sciences (IBMS) 256

Interior Design (IDES) 256

J

Journalism - Graduate (JGRD) 259

Journalism & Mass Communications-New Core (JOMC) 257

Journalism (JOUR) 258

Judaic Studies Program (JUDS) 261

L

Landscape Architecture (LARC) 261

Latin (LATN) 261

Law (LAW) 261

Life Sciences (LIFE) 316

Loans and Need-Based Funding 513

M

Majors, Minors, and More 503

Management (MNGT) 316

Marketing (MRKT) 320

Master's Degrees 508

Materials Engineering (MATL) 323

Mathematics (MATH) 325

Mechanical Engineering (MECH) 334

Mechanized Systems Management (MSYM) 342

Medieval and Renaissance Studies (MRST) 344

Meteorology (METR) 345

Modern Languages (MODL) 349

Music - Applied (MUAP) 360

Music - Composition (MUCP) 363

Music - Ensembles (MUEN) 363

Music - Opera (MUOP) 366

Music Education (MUED) 366

Music Ensemble (credit only) (MUCO) 369

Music Ensemble (degree credit) (MUDC) 369

Music (MUSC) 350

N

Natural Resources (NRES) 370

Nutrition and Health Sciences (NUTR) 382

P

Philosophy (PHIL) 388

Physics (PHYS) 391

Plant Health Program (DPLH) 393

Plant Pathology (PLPT) 394

Political Science (POLS) 395

Post-Baccalaureate Teacher Certification 12

Probation and Termination 510

Professional Studies Policies 515

Programs 4

Psychology (PSYC) 398

R

Raikes School of Computer Science and Management (RAIK) 405

Registration, Credit, and Grades 497

Registration Requirements 501

Religious Studies Program (RELG) 406

Russian (RUSS) 406

S

Science Literacy (SCIL)	407
Social Work (SOCW)	407
Sociology (SOCL)	407
Spanish (SPAN)	411
Special Education (SPED)	414
Speech-Language Pathology and Audiology (SLPA)	424
Statistics (STAT)	430
Supply Chain Management and Analytics (SCMA)	436
Survey Research and Methodology (SRAM)	438

T

Teaching, Learning and Teacher Education (TEAC)	440
Textiles, Merchandising and Fashion Design (TMFD)	468
Theatre Arts (THEA)	475
Tuition and Fees	502
Turfgrass and Landscape Management (TLMT)	480

V

Veterinary and Biomedical Sciences (VBMS)	480
Veterinary Medicine (VMED)	484

W

Water Science (WATS)	487
Women's and Gender Studies Program (WMNS)	487