

GRADUATE STUDIES CATALOG 2022–2023



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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. 3).

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 the 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.

Governance and Responsibilities

- The Graduate College Governance and Organization covers the administration of Graduate Studies within UNL and NU.
- Student Conduct and Responsibility covers standards, regulations, and procedures.
- Guidelines for Good Practice in Graduate Education provide guidance for faculty and graduate students in the areas of professionalism and ethics, teaching, research, and advising and mentoring.

The Graduate College Governance and Organization

Graduate studies at UNL are organized and conducted according to the policies and rules of the Graduate College of the University of Nebraska. The governance of graduate programs principally lodged at UNL is by and through the programs' Graduate Committees, the UNL Graduate Council, and the Dean for Graduate Studies in accordance with the policies and rules of the Graduate College. The UNL Graduate Catalog is the primary source of the policies and rules in effect on the UNL campus.

Dean for Graduate Studies

The UNL Dean for Graduate Studies is recommended for appointment by the UNL Chancellor and by the President, University of Nebraska. Appointment is made by the Board of Regents. The Dean for Graduate Studies is administratively responsible for the welfare of all graduate programs at UNL, and for implementing the policies and rules concerning graduate studies. The Dean for Graduate Studies acts as liaison officer

between the UNL Chancellor and the system-wide Dean of the Graduate College.

Graduate Council

The UNL Graduate Council serves as the administrative body for graduate studies acting on behalf of the UNL Graduate Faculty. The Graduate Council also serves as an advisory body to the Dean for Graduate Studies. The Graduate Council is an elected body and subject to the authority of the Graduate Faculty. The Council is composed of eight elected members of the Graduate Faculty, two graduate students, and the Dean for Graduate Studies who serves as chair of the Graduate Council.

Graduate Committees

Each department, school or interdepartmental area offering major work leading to the master's or doctoral degree shall have a Graduate Committee consisting of not less than three members of the Graduate Faculty, one of whom shall serve as Committee Chair. Membership on the Graduate Committee is determined by the Graduate Faculty of the department, school or interdepartmental area. Under the leadership of the Committee Chair, the Graduate Committee is responsible for the general supervision of graduate work in the department, school or interdepartmental area.

The Committee Chair is recommended by the department chair/head or school director for approval and appointment by the Dean for Graduate Studies. The Committee Chair acts as liaison between their Graduate Committee and the Dean for Graduate Studies. The Committee Chair is charged with ensuring fair and consistent compliance with all Graduate College and UNL policies that govern graduate education. The Committee Chair coordinates the oversight of all graduate degrees, majors, specializations, minors and certificate programs to ensure that every graduate student and member of the graduate faculty is held to the highest standards of academic integrity.

Organizational Chart of the Graduate College:

Source: Graduate College Policy Handbook (revised June 28, 2018)

Student Conduct and Responsibility STANDARDS

Students at the University of Nebraska are members of an academic community in which academic integrity and responsible conduct are essential for the community to function. To ensure that students know what is expected of them, the University has adopted the Standards of Academic Integrity and Responsible Conduct ("Standards"), as described in the Student Code of Conduct (<https://studentconduct.unl.edu/student-code-conduct/>). It is the responsibility of each student to understand and adhere to the Standards at all times.

Graduate students are also expected to maintain a high level of professionalism in all aspects of their training and engagement with peers, faculty, staff, and other members of the academic community. Graduate students often assume the role of researcher, scholar, teacher, mentor, supervisor, service provider, and member of professional societies. These roles require graduate students to act professionally at all times as representatives of the University of Nebraska.

REGULATIONS AND PROCEDURES

It is the responsibility of graduate students to be familiar with the information presented in this Graduate Catalog and to observe all regulations and procedures relating to the program they are pursuing. In no case will a regulation be waived or an exception granted because a student pleads ignorance of, or contends that they were not informed of, the regulations or procedures.

Responsibility for following all policies and meeting all requirements for graduate programs rests with the student. A student progressing toward degree completion should be familiar with all milestone dates and deadlines described in Steps to Degree Completion (<https://www.unl.edu/gradstudies/academics/degrees/>).

Graduate students may abide by the requirements of the Graduate Catalog in force at the time they are admitted to, and begins course work in, a degree program; or they may, with the consent of their adviser, graduate under a subsequent Catalog provided the student complies with all requirements of the later Catalog.

The University of Nebraska-Lincoln expressly reserves the right, whenever considered necessary or desirable, to: 1) add or delete courses from its offerings and to change times or locations; 2) change academic calendars; 3) cancel any course for insufficient registrations; 4) modify, consolidate, or delete any program; 5) revise or change rules, charges, fees, schedules, courses, requirements for degrees and any other regulation affecting students including, but not limited to, evaluation standards.

Guidelines for Good Practice in Graduate Education

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. 3) 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. 3) 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 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

The University of Nebraska is a public university committed to providing a quality education to a diverse student body. Students are selected on the basis of academic preparation, ability, and the availability of space in the desired academic program. The Office of Graduate Studies adheres to the University of Nebraska's nondiscrimination policy (<https://www.unl.edu/equity/notice-nondiscrimination/>).

The University of Nebraska-Lincoln reserves the right to change the regulations with respect to admission to the Office of Graduate Studies, the continuance of graduate study and the granting of the degree.

All materials submitted become the permanent property of the Office of Graduate Studies and will not be photocopied for individual use, returned, or forwarded to other agencies. The Office of Graduate Studies follows the Board of Regents of the University of Nebraska policies regarding records retention.

Admission Eligibility Requirements

Admission to the Office of Graduate Studies requires a complete application for admission. Applicants must submit an application, application fee, and transcripts from all post-secondary schools attended. If admitted and enroll official transcripts from all post-secondary schools attended are required.

Baccalaureate or Higher Degree

Applicants must hold a baccalaureate (bachelors) or higher degree from an institution that is regionally accredited or from 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 the Office of Graduate Studies. If the student's native language is not English, verification of English proficiency is required.

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 with final approval from the Dean for Graduate Studies.

The minimum requirement for admission to a University of Nebraska-Lincoln graduate program is 16 years of study. This is usually 12 years of elementary and secondary education plus four years of post-secondary study at an accredited college or university. Applicants must have reached an academic level equivalent to a U.S. bachelor's degree. Students with only three years of post-secondary education are not eligible for admission. In such cases, students may become eligible with:

- a master's degree (or higher) from an accredited higher education institution
- an approved postgraduate diploma from an accredited higher education institution
- one additional year upper-level coursework from an accredited higher education institution

There is no guarantee that academic documentation will qualify for graduate study until all documents have been reviewed. When applying, transcripts are required for all post-secondary coursework. Degree certificates are required if the applicant has completed international coursework. If we are unable to verify the nature or authenticity of foreign academic documents, the applicant will be asked to provide supplemental information or to obtain an evaluation from a foreign credential evaluation service at the applicant's expense. The final admission decision rests with the Dean for Graduate Studies.

Applicants who have been dismissed from another institution for academic dishonesty or violations of student codes of conduct are not eligible for admission to the University of Nebraska-Lincoln Office of Graduate Studies. Students whose UNL graduate program has been terminated for reasons other than violations of the student code of conduct may apply for admission to another degree program, certificate program, or admission as a non-degree seeking student.

Previously Enrolled Students: Students who have not been enrolled for three consecutive terms and who (if eligible) have not been approved for an Academic Leave will need to reapply for admission. (See Student Code of Conduct Section 1.A.3 (<https://studentconduct.unl.edu/student-code-conduct/>))

University of Nebraska Employee Seeking Admission: All faculty and staff employees are eligible for admission to all graduate admission categories and are subject to standard admission requirements. Faculty members holding the rank of Assistant Professor or above (or equivalent) must also adhere to the University of Nebraska Graduate College Policy on Faculty Admission. (<https://nebraska.edu/-/media/projects/unca/offices-policies/provosts-office/academic-affairs/nu-graduate-college-policy-handbook.pdf?la=en>) (p.44)

Application for Admission

An application is required of all degree, graduate certificate, teaching and administrative endorsements, and non-degree seeking applicants. Applications are valid for the term specified on the application. In order for students to be successful, all academic units should finalize admission recommendations prior to the start of each term. The final date for processing admission is the first Friday of classes, for each term respectively. (See Term Change Policy) (p.)

To apply, submit the following to the Office of Graduate Studies:

- **Graduate Application for Admission**
- **Application Fee:** Non-refundable, non-transferrable application fee (See Application Fee policy) (p.)
- **Unofficial transcripts:** Transcripts are required of all post-secondary work, from which college credit was earned or not earned, listing courses, marks, and a bachelors or higher degree conferred. Documents in a foreign language must also include certified English translations. (See Certified English Translation policy) (p. 8)
All transcripts and/or academic documents uploaded to the online application system are considered unofficial. Official transcripts

will be required from all students who are admitted and enroll. (See Transcript policy) (p. 7)

- **English Proficiency:** If the student's native language is not English, verification of English proficiency is required (See English Proficiency policy) (p. 8)

Applicants must also fulfill any additional requirements specified by the department including but not limited to portfolio, statement of purpose, letters of recommendation, or writing samples at the time of application. Letters of Recommendation must be received via the application system.

Application Fee

An application and application fee are required for all degree, graduate certificate, teaching and administrative endorsements, and non-degree seeking applicants. The Office of Graduate Studies does not issue application fee waivers. Departments may elect to cover the cost of the application fee. Application fees are non-refundable and non-transferable.

Amount

- \$50 – All applicants unless for currently enrolled UNL students
- \$25 – Currently enrolled UNL students (graduate and undergraduate)
- Exemptions
 - United States military personnel. This applies to the service member (active duty military, guard, veteran, or reserve), spouse and/or dependents.
 - Pell Grant recipients
 - McNair Scholars
 - Big Ten Academic Alliance FreeApp applicants who meet BTAA eligibility requirements and have participated in an undergraduate Summer Research Program on a BTAA campus

Transcripts

Applicants must submit transcripts of all post-secondary work from which college credit was earned or not earned, listing courses, marks, and degrees conferred. Documents in a foreign language must also include certified English translations.

- **APPLY** with unofficial transcripts of all post-secondary coursework, showing a baccalaureate or higher degree conferred or expected by the applied term.
- **ADMIT** with unofficial transcripts of all post-secondary coursework, showing a baccalaureate or higher degree conferred or expected by the applied term.
- **ENROLL** with unofficial transcripts of all post-secondary coursework, showing a baccalaureate or higher degree conferred or expected by the applied term.
- **CONTINUED ENROLLMENT** with final, official transcripts of all post-secondary coursework, showing conferral of a baccalaureate or higher degree by the established deadlines below.

*Degree certificates are required if the applicant has completed international coursework.

All credentials uploaded to the online application are considered unofficial. Students may apply, be admitted with 'Conditional Graduate Admission' by the Office of Graduate Studies and enroll for their first term with unofficial documents. At the time of conditional admission, a registration hold will be placed on the students record for the subsequent term. Final, official transcripts are required from all enrolled students by the specified deadline below.

The Office of Graduate Studies will review all official documents to finalize the offer of admission. An offer of admission will be revoked if all official transcripts and/or required documents are not received by the Office of Graduate Studies within specified deadline(s), or if discrepancies exist between official documents received and the copies uploaded by the applicant prior to the offer of admission. Final, official transcripts showing conferral of a baccalaureate or higher degree must be received by October 1 for Fall, February 1 for Spring, and July 1 for Summer. After final, official transcripts and (if applicable, degree certificates) showing conferral of a baccalaureate or higher degree are received and verified, the Office of Graduate Studies will process full graduate admission and remove the registration hold.

| Semester Admitted & Enrolled | Deadline for submission of any outstanding admission requirement(s) | When requirements are met by deadline | If requirements are not met by deadline |
|------------------------------|---|--|--|
| Fall | October 1 | Registration Hold is lifted, Full Graduate Admission | Admission rescinded, no graduate credit earned |
| Spring | February 1 | Registration Hold is lifted, Full Graduate Admission | Admission rescinded, no graduate credit earned |
| Summer | July 1 | Registration Hold is lifted, Full Graduate Admission | Admission rescinded, no graduate credit earned |

University of Nebraska Coursework: Former and current University of Nebraska students are not required to submit transcripts for prior NU coursework. The Office of Graduate Studies will obtain NU transcripts.

How to Submit Documents:

- **Unofficial Documents:** All transcripts and/or academic documents uploaded to the online application system are considered unofficial. Documents in a foreign language must also include certified English translations. An unofficial transcript printed from your current/previous institution(s) student system is not an acceptable document.
- **Official Documents:** Official academic records are required of all students who enroll and must be sent directly to The Office of Graduate Studies by the appropriate university officials at the student's prior institution(s). Photocopies of certified documents are not considered official. Faxed documents, scanned documents, notarized photocopies, and copies made by translators or evaluation agencies are not considered official. An official transcript bears the original signature of the registrar and/or the original seal of the issuing institution. These documents may be mailed or delivered by the student in an envelope sealed by the issuing institutions registrar. The Office of Graduate Studies also accepts electronic transcripts from accredited U.S. colleges and universities sent via the National Student Clearinghouse, eSCRIP-SAFE, Docufide, Parchment Exchange or directly from the accredited U.S. college and university. The Office of Graduate Studies does not accept electronic transcripts from international colleges or universities. Documents in a foreign language must also include certified English translations.

Certified English Translation: International students must upload copies of all college or university level transcripts or mark sheets (records of courses and marks earned), with certificates, diplomas, and degrees earned plus certified English translations. Official documents are required from all students who are admitted and enroll. All degree certificates from Chinese institutions must be verified by the China Academic Degrees and Graduate Education Development Center (CDGDC). Documents in a foreign language must also include certified English translations.

Additional Requirements for International Applicants

English Proficiency:

- **English Proficiency:** Applicants to the Office of Graduate Studies 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. Non-native English speaking applicants who have received a baccalaureate or higher degree from a US university or a university outside the US in which English is the official language of instruction are exempt from the English Proficiency requirement for admission. Completed degrees at an institution in an English-speaking country are not subject to English proficiency requirements. Applicants from U.S. Territories are exempt from the English Proficiency requirement.
- **English Language Test (ELT):** Each international student's Letter of Admission will state whether they are required to take the ELT.

International Students who must take the ELT upon arrival to Lincoln:

- A TOEFL iBT writing score below 25 or a TOEFL total below 100
- An IELTS writing score or total IELTS score below 7.0

International Students who are exempt from taking the ELT upon arrival to Lincoln:

- Students whose native language is English
- Students who have earned a bachelors or higher degree from an institution at which English is the exclusive language of instruction
- Students who have earned a bachelor's or higher degree from a country in which English is the official language.
- Students who have earned a bachelors or higher degree from an institution in a U.S. territory
- **ENG 887:** If the student's ELT score is below 85, the student will be placed in ENGL 887, a 3-credit hour course to build English communication skills, emphasizing writing essays and research papers. The course can count toward the student's plan of study. If the student's ELT score is 85 or higher, the student is exempt from any further English language courses unless required by a departmental program.
- **ITA:** New holders of teaching assistantships (<https://unl-curr.courseleaf.com/graduate-professional/policies/funding/>) who are non-native speakers of English must attend the International Teaching Assistant Institute (<http://www.unl.edu/gradstudies/current/ita/>).

Proof of Financial Resources

To study at the University of Nebraska-Lincoln on an F-1 (student) or J-1 (exchange visitor) visa, you will need a Form I-20 or Form DS-2019 from the University for your visa interview and for entering the United States. Evidence of adequate financial resources (<http://www.unl.edu/gradstudies/prospective/international/financial/>) for tuition and living expenses is required of all admitted 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.

Admission Categories

Degree

Applicants must submit an application, application fee, and unofficial transcripts from all post-secondary schools attended. If a student is admitted and enrolls, official transcripts are required to confirm receipt of a baccalaureate degree or higher. The student must also satisfy additional requirements the department specifies.

Graduate Certificate

Applicants must submit an application, application fee, and unofficial transcripts from all post-secondary schools attended. If a student is admitted and enrolls, official transcripts are required to confirm receipt of a baccalaureate degree or higher. The student must also satisfy additional requirements the department specifies.

Non-Degree

Non-degree, postbaccalaureate, teaching and administrative endorsement applications are reviewed by the Office of Graduate Studies upon receipt of an application, application fee, proof of English Proficiency and transcripts showing conferral of a baccalaureate or higher degree by the established deadline. If a student is admitted and enrolls, official transcripts and (if applicable, degree certificates) are required to confirm the receipt of a baccalaureate degree or higher

Non-Degree Limitations: There are some limitations to a non-degree, post-baccalaureate admission:

- This admission category does not guarantee future admission to a graduate certificate, teaching and administrative endorsement, or degree program, nor does it guarantee that coursework completed as a non-degree student can later be applied toward a degree or certificate.
- Admission to a degree program must be gained prior to the accumulation of half of the hours required for the degree sought.
- Students do not qualify for assistantships or fellowships;
- This admission category is not available to international students on F-1 student visas;
- This admission category may affect the student's ability to receive federal financial aid; contact the Office of Scholarships and Financial Aid for more information.

Intercampus

Students already attending a University of Nebraska campus may take courses at another University of Nebraska campus while retaining their admission at their degree objective (home) campus by submitting the Request for Intercampus Enrollment (<https://www.unl.edu/gradstudies/academics/intercampus/>), subject to approval by both campuses.

Changes to Application or Admission Term Change

- **Pre-Admission:** If the application has not been submitted, the applicant can make the change on their in-progress application. If the application has been submitted and the applicant requests to change the entry term on their application, the applicant must request this change by submitting an email to graduate@unl.edu. Departments requesting an entry term change must submit written authorization from the student to request the change. Departments may request this change by submitting an email to graduate@unl.edu prior to an admission recommendation being submitted to the Office of Graduate Studies.
- **Post-Admission:** An admitted student or department may request to change the entry term one time per application for any of the three consecutive future terms (Fall, Spring, Summer). There is no guarantee of an offer of an assistantship if there is a request to change an entry term. Students who are admitted and do not have approval to change their entry term must reapply. International students who wish to change their entry term are required to provide updated financial information in order to receive a new I-20 or DS-2019. Entry term changes cannot be retroactive. The applicant must request this change by submitting an email to graduate@unl.edu.
- **Post-Enrollment:** Retroactive admission to a prior term already completed is not allowed.

Academic Objective Change

- **Pre-Admission:** If the application has not been submitted, the applicant can make the change on their in-progress application. If the application has been submitted and the applicant requests to change the academic objective within the same program they applied to, the applicant must request this change by submitting an email to graduate@unl.edu. Departments requesting an academic objective change must submit written authorization from the student to request the change. Departments may request this change by submitting an email to graduate@unl.edu prior to an admission recommendation being submitted to the Office of Graduate Studies.
- **Post-Admission:** If an admitted student requests to change to a different academic objective a new application for admission and application fee is required.
- **Post-Enrollment:** An admitted student who requests to change to a different academic objective in the same major or program should consult the Master's or Doctoral Specialists. If an admitted student requests to change to a different academic objective in a different major or program, a new application for admission is required.

Major/Program Change

- **Pre-Admission:** If the application has not been submitted, the applicant can make the change on their in-progress application. If the application has been submitted and the applicant requests to change the major/program they applied to, the applicant must reapply.
- **Post-Admission:** If the applicant has been admitted and wishes to change the major/program they applied to, a new application for admission is required.
- **Post-Enrollment:** If the student wishes to change the major/program they applied to, a new application for admission is required. An admitted student who requests to change to a different specialization should consult with the Master's or Doctoral Specialist in the Office of Graduate Studies.

Specialization Change

- **Pre-Admission:** If the application has not been submitted, the applicant can make the change on their in-progress application. If the application has been submitted and the applicant requests to change specialization they applied to, the applicant must request this change by submitting an email to graduate@unl.edu. Departments requesting a specialization change must submit written authorization from the student to request the change. Departments may request this change by submitting an email to graduate@unl.edu prior to an admission recommendation being submitted to the Office of Graduate Studies.
- **Post-Admission:** If the applicant has been admitted and wishes to change the specialization they applied to, written authorization from the student and the department requesting this change must be submitted via email to graduate@unl.edu.
- **Post-Enrollment:** An admitted and enrolled student who requests to change to a different specialization should consult with the Master's or Doctoral Specialist in the Office of Graduate Studies.

Application Withdrawal

- **Student Withdrawal:** Admitted students may choose to withdraw their application for admission in the Applicant Portal using the Decision Form, selecting 'Decline Admission.'
- **Administrative Withdrawal:**
 - The applicant may be ineligible for admission and/or enrollment if required information is withheld or given falsely by the applicant.
 - Failure to request an entry term change prior to the first day of classes for the admitted term, will result in administrative withdrawal.
 - Other circumstances as determined by the Dean for Graduate Studies.

Admission Decisions

Official Decision Notification

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. Admission is granted solely by Graduate Studies and is confirmed by the issuance of a Letter of Admission. The Office of Graduate Studies issues the official Letter of Admission, not departments. Academic departments will notify applicants concerning awards of financial assistance.

Negative admission decisions are not appealable.

Admission Status

Admission status is determined and assigned by the Office of Graduate Studies, not departments.

- **Full Graduate Admission:** Having met all requirements for admission by the Office of Graduate Studies. 'Full Graduate Admission' is granted to students considered fully qualified to begin a program toward a graduate degree, certificate, or teaching endorsement for which they were admitted.
- **Conditional Graduate Admission:** Granted to students considered qualified to begin a program toward a graduate degree, certificate,

or teaching endorsement for which they were admitted but have yet to meet all conditions of admission, as determined by the Office of Graduate Studies and specified in the Letter of Admission. Students admitted with "Conditional Graduate Admission" must satisfy all conditions of admission by the established deadline(s); failure to do so will result in admission revocation. "Conditional Graduate Admission" is changed to "Full Graduate Admission" when all conditions of admission have been met, as determined by the Office of Graduate Studies.

Students meeting all administrative requirements for admission according to the Office of Graduate Studies, but having some academic deficiencies, as determined by the academic department will be the responsibility of the department to ensure the student takes the necessary steps to complete courses and/or trainings on their graduate plan of study. Such deficiencies will not be monitored by the Office of Graduate Studies.

Intent to Enroll

Students may choose to accept or decline their admission in the Applicant Portal, using the Decision Form. <https://go.unl.edu/gradappstatus> (<https://go.unl.edu/gradappstatus/>)

- **Accept Admission:** Accepting admission in the applicant portal makes the student eligible for enrollment.
- **Decline Admission:** The student's decision to decline an offer of admission is a final decision and terminates the Letter of Admission.

- last updated 2/26/2020 -

Academic Program Requirements

Enrollment Options

Degrees and Majors

The University of Nebraska-Lincoln offers many graduate programs (<https://www.unl.edu/gradstudies/academics/programs/>) leading to the doctoral degree, the master's degree, the educational specialist degree, and graduate certificates. To earn a graduate degree, students must choose a disciplinary major and meet all coursework and other academic requirements.

Specializations

A specialization is a focused collection (subset) of courses within a major. Specializations must represent a minimum of 9 credit hours of the degree requirements. Students may choose a specialization at the time of application or later when submitting a master's Memorandum of Courses or doctoral Program of Studies. A specialization is listed with the major on official transcripts.

Concurrent Degrees

Graduate students may be admitted to two degree programs simultaneously with approval of each Graduate Program Committee and the Dean(s) for Graduate Studies. Concurrent degrees may be pursued on multiple campuses of the University of Nebraska system. Concurrent degrees may be pursued by two possible routes:

- **Coordinated Dual Degree Programs:** Established dual degree programs shall appear as a single application on the Graduate Application for Admission. (An exception is the College of Law dual degree programs that require two separate applications.) With

the required approval, credit hours may be shared between both degrees. Specific courses to be shared must be identified at the time coordinated programs are established. Coordinated programs result in the conferral of two degrees. Both diplomas must be awarded in the same commencement term if credit hours are shared.

- **Independent Concurrent Degrees:** Pursuit of two unrelated graduate degrees requires two separate applications and two application fees. Application to each degree program need not occur in the same term. Each degree program is administered independently of each other; however, approval by each Graduate Program Committee and the Dean(s) for Graduate Studies is required. Credit hours may be shared between both degrees. Specific courses to be shared must be identified at the time of approval. Completion of requirements for independent concurrent degrees results in the conferral of two degrees. Both diplomas must be awarded in the same commencement term if credit hours are shared.

SOURCE:

- Executive Graduate Council Minutes (March 19, 1992)
- UNL Graduate Council Minutes (September 5, 2019)

One Degree, Double Major

Students pursuing a master's degree may add a second major, with approval of the Graduate Program Committees of each major. Students approved for a double major must meet the minimum requirements for each major, including at least 18 hours in each major, excluding cross-listed courses in the second major. The precise number of credits may vary depending on the total required hours for a particular major. For each major, students must take at least 8 credits in courses open only to graduate students (900 level or 800 level without an undergraduate level counterpart), excluding thesis hours.

Students are required to satisfy the comprehensive examination schedule—written and/or oral examination—for each major. The examination committee shall consist of two graduate faculty members (or non-graduate faculty approved to perform specified graduate faculty duties) from each of the major departments/areas. The committee shall be co-chaired by a faculty member from each of the major departments.

SOURCE:

- UNL Graduate Council Minutes (April 27, 1995)

Minors

A minor for the master's degree under any option must consist of at least 9 credit hours and may be taken in any one department or interdepartmental area that has been approved to offer a major leading to a master's degree. In addition, the minor may, in certain departments, be completed in a subdivision of the administrative department. Approved fields of study, which may be selected within each administrative department, must be approved by the Graduate Council for use as a minor.

A minor for the doctoral degree must include at least 15 credit hours with 6 hours in courses open exclusively to graduate students (900 level or 800 level without an undergraduate level counterpart). It may be taken in any department that has been approved to offer a major leading to a master's degree. In addition, the minor for the doctorate in certain departments may be completed in a subdivision of the administrative department. Approved fields of study, which may be selected within each

administrative department, must be approved by the Graduate Council for use as a minor.

Graduate Certificates

A graduate certificate is an academic credential awarded to a student upon completion of required coursework in a specific subject area. Graduate certificate programs are post-baccalaureate and consist of 12-20 credit hours. Students may be admitted to a graduate certificate and graduate degree program simultaneously, although admission to a degree program is not required. At the discretion of a student's supervisory committee, credit hours earned in a certificate program may apply to a degree program.

SOURCE:

- UNL Graduate Council Minutes (January 22, 1979)
- Executive Graduate Council Minutes (March 15, 1979)
- Board of Regents Minutes (July 15, 2000)

Non-Degree Coursework

Students meeting the minimum admission requirements (p. 6) may enroll in graduate courses. Acceptance in a graduate certificate or degree program is not required. 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 is not available to international students on F-1 student visas.

Teacher Certification and Added Endorsements

UNL offers graduate courses leading to the State of Nebraska Department of Education (NDE) initial teacher certification, renewal of teacher certification, and added endorsements. Teacher certification is granted by the NDE, not the University. Coursework leading to certification can be completed at UNL. The NDE determines the content requirements; the University delivers the courses.

Doctoral Degrees

Overview of Programs

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, Enrollment Options (above) 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.

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.) prior to completion of one half of the doctoral coursework.
2. Complete a Program of Studies (p. 12), 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. 13).
4. Pass a comprehensive examination (p. 13) – in the major and minor fields of study.
5. Achieve candidacy (p. 13) 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. 14) (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.

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

The Supervisory Committee shall approve the student's Program of Studies; monitor the student's academic progress; approve the dissertation subject; prepare, give and evaluate the comprehensive examination; approve the final dissertation; and prepare, give and evaluate the final examination. (*SOURCE: Graduate College Policy Handbook, 2018*)

A Supervisory Committee is established **before a doctoral student has accumulated 45 credit hours**, including any transfer hours, but excluding research or language tools. Prior to the approval of the student's Program of Studies, the Supervisory Committee is appointed by the Dean for Graduate Studies based on a recommendation of the departmental or interdepartmental Graduate Committee in the student's major.

The Supervisory Committee consists of at least four members of the Graduate Faculty (p. 25) or non-Graduate Faculty approved to perform specified Graduate Faculty duties. At least one Graduate Faculty member external to the academic department or program, but within the University of Nebraska Graduate College, must be included on the committee to serve as the Outside Representative. If the student is pursuing a minor, the committee member from the minor department may serve as the Outside Representative.

Graduate Faculty with **emeritus status** may co-chair the supervisory committees of doctoral students with a resident Graduate Faculty member.

Member Roles

- **Chair or Co-chair:** The Chair or Co-chair of a doctoral student's committee serves as the advisor and mentor of the student. The Chair or Co-chair may not serve as the Outside Representative or as a designated Reader.

- **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. Special Members and Outside Representatives may serve as Readers.
- **Outside Representative:** The role of the Outside Representative is to broaden the scholarly representation of the student's committee and to provide an impartial perspective. If the student is seeking a minor, the faculty member representing the student's minor may serve as the Outside Representative.
- **Special Member:** A faculty member from another institution external to the University of Nebraska system may serve as an "extra" committee member. Only one Special Member may serve on a supervisory committee. Special Members have voting rights on the committee. A Special Member may serve as a Reader, but may not serve as the 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.

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 87 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 87-96 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.

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 (<https://nebraska.edu/faculty-and-staff/resources/employee-dependent-scholarship-program/>).

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. At the discretion of the supervisory committee, an oral comprehensive examination may also be required.

Requirement and Scheduling

The Supervisory Committee arranges for comprehensive examinations 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 (<https://www.unl.edu/gradstudies/academics/academic-leave/>) 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

Approval of the dissertation is solely the responsibility of the Supervisory Committee. The academic expectations and standards of acceptability for dissertations, as established by each departmental Graduate Committee, shall be the benchmark by which dissertations are judged. No individual or organization other than the University of Nebraska graduate faculty (or non-graduate faculty members granted permission to serve on Supervisory Committees) may participate in judging the acceptability of a dissertation, including (but not limited to) journal editors, peer reviewers, and adjudicators.

Submission of manuscripts or other works for publication shall not be a requirement for the graduate degree. This does not preclude departmental Graduate Committees from stating in their graduate handbooks the expectation that a dissertation should yield publication-quality research or juried works; nor does it prevent graduate students from submitting manuscripts and publishing articles prior to defending their dissertation.

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.

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.

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

Options for the Master's Degree

The Graduate College offers the following master's degrees:

- Master of Arts (MA)
- Master of Architectural Engineering (MAE)
- Master of Applied Science (MAS)
- Master of Arts for Teachers (MAT)
- Master of Business Administration (MBA)
- Master of Community and Regional Planning (MCRP)
- Master of Education (MEd)
- Master of Engineering Management (MEM)
- Master of Fine Arts (MFA)
- Master of Legal Studies (MLS)
- Master of Music (MM)
- Master of Professional Accountancy (MPA)
- Master of Science (MS)
- Master of Science for Teachers (MST)

A master's degree student may pursue a specific major under Option A (thesis required) or Option B (thesis not required). The major for the master's degree under either option is comprised of approved courses in any department offering a program leading to the master's degree. Some limitations concerning options may be imposed by a department where such a choice is not feasible. In choosing an option, a student should be guided by the type of training desired. A master's degree student may change a declared option during their program of study with written approval from the adviser, 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 A to Option B if certification of full time status (<https://go.unl.edu/gradfulltime/>) has been utilized.

Option A

The master's degree under Option A requires a thesis. Option A is most appropriate for students who are preparing for careers in research and scholarly work or additional academic pursuits beyond the master's degree. Under this option, a student must earn a minimum of 30 credit

hours, consisting of 20 to 24 credit hours of regular course work, plus a thesis equivalent to 6 to 10 credit hours. At least one-half of the credit hours required for the degree, including thesis, must be in the major (at least 18 credit hours for the Master of Education degree). The remaining work may be in supporting courses and may comprise a minor consisting of at least 9 credit hours selected from and approved by the minor department. At least 8 credit hours, excluding thesis, must be earned in courses open exclusively to graduate students (900 level or 800 level without 400 or lower counterparts).

Option A is not available for the Master of Professional Accountancy degree.

Thesis Requirements. The subject of the thesis shall be chosen from the student's field of major interest and must be approved by the departmental Graduate Committee. The thesis should reveal a capacity to carry on independent study or research and should demonstrate the student's ability to use the techniques employed in their field of investigation. Research activities involving human subjects or live vertebrate animals may not be conducted at the University of Nebraska-Lincoln unless the research activities have been reviewed and approved by the appropriate board or committee. The Institutional Review Board (IRB) reviews projects involving human subject research and the Institutional Animal Care and Use Committee (IACUC) reviews the use of animals in research. These reviews are in accordance with Federal regulations, state laws and institutional policies. Submission of protocols to conduct human subject or animal research is coordinated by the Research Responsibility (<https://research.unl.edu/researchresponsibility/>) offices. Approval must be secured prior to the initiation of the research.

The thesis must conform to the required style and format described in Steps to Degree Completion (<https://www.unl.edu/gradstudies/academics/degrees/>). A copy of the thesis and abstract must be approved by the student's major advisor and submitted for preliminary review to the Master's Programs Coordinator in the Office of Graduate Studies at least two weeks (one week in the summer sessions) before the date of the candidate's final oral examination. A candidate is not eligible for the oral examination until the thesis is completed and approved. After passing the final oral examination, the thesis must be electronically submitted to the Master's Programs Coordinator for a final review prior to being uploaded to Digital Commons.

Option B

The master's degree under Option B does not require a thesis. Option B is most appropriate for students pursuing practice-based or professional careers in which the master's degree provides suitable training. Under Option B, a student must earn a minimum of 30 credit hours. At least one-half of the credit hours required for the degree must be in the major. The remaining work may be in supporting courses and may comprise a minor consisting of at least 9 credit hours selected from and approved by the minor department. At least 15 credit hours must be earned in courses open exclusively to graduate students (900 level or 800 level without 400 or lower counterparts).

The Master of Professional Accountancy plan of study may not include a minor.

The Master of Education plan of study may not include a minor, but must include at least 6 credit hours of education courses outside the major.

Time to complete a Master's Degree

A master's degree student is expected to complete all degree requirements within five years of their first term of admission to the

master's degree program, unless the student is enrolled in a program with a different time limit that has been approved by the Office of Graduate Studies. Graduate courses taken prior to the start of the master's degree program and not counted toward a previously awarded graduate degree may be included on the student's Memorandum of Courses, provided the previous courses were taken within 10 years at the time of degree completion.

Memorandum of Courses

The Memorandum of Courses must be submitted to the Office of Graduate Studies before the student has completed more than one-half of the prescribed program. Prior to submission, the Memorandum of Courses must be approved by the student's adviser, the major departmental or area Graduate Committee Chair, and the minor department Graduate Committee Chair (if applicable). It is the student's responsibility to secure the proper approvals and to submit to the Master's Programs Coordinator, as described in Steps to Degree Completion (<https://www.unl.edu/gradstudies/academics/degrees/>). Final review and approval of the Memorandum of Courses is made by the Dean for Graduate Studies. A student may NOT file a Memorandum of Courses and graduate in the same semester or summer term.

Admission to Candidacy

A student is admitted to Candidacy for the master's degree when admission deficiencies, if any, have been removed and when a Memorandum of Courses receives final approval.

Final Comprehensive Examination

A student pursuing a Master's degree is required to complete a final comprehensive examination, administered as a written and/or oral examination, within 24 months prior to the date of graduation. The comprehensive examination is required to cover the student's approved program of study, as specified by the major and minor (if applicable) departments. The comprehensive examination in the minor field(s) may be waived subject to the approval of the minor department(s), provided all grades in the minor department are at least a B or pass.

If an oral examination is required, the examining committee, approved by the Dean for Graduate Studies on recommendation of the major department, will consist of at least three members representing the major and minor (if applicable) departments. All professors on the examining committee must either be on the Graduate Faculty, or be non-Graduate Faculty approved to perform specified Graduate Faculty duties. If a member of the examining committee other than the chair leaves the employ of the University, or retires, a replacement should be appointed. In certain circumstances where continuing expertise is needed, the departing faculty member may continue as a member or co-chair of the committee, with approval of the department Graduate Committee and the Dean for Graduate Studies. If the master's degree is being earned under Option I without a final oral examination, the thesis must be approved in writing by a Graduate Faculty member in addition to the major adviser.

In the event that members of an oral examining committee are not unanimous regarding passing a Candidate, the student is to be approved for the degree if only one examiner dissents. In such cases, the dissenting member of the committee will be expected to file a letter of explanation in the Office of Graduate Studies.

If a student fails to pass the final oral or written examination for an advanced degree, their committee must file a report on the failure in the Office of Graduate Studies and indicate what the student must do before

taking another examination. Another examination may not be held during the same semester or the same summer term in which the student failed.

Master's Thesis

The master's thesis and abstract in preliminary form must be approved by the adviser prior to applying for the final oral examination or for its waiver (at least four weeks prior to the examination). An electronic copy of the thesis and abstract in preliminary form must be submitted to Master's Programs Coordinator in the Office of Graduate Studies for approval at least two weeks (one week in summer) prior to the final oral examination. This copy will be reviewed and the student notified of any changes to be made. The guidelines for thesis preparation and submission deadlines are described in Steps to Degree Completion (<https://www.unl.edu/gradstudies/academics/degrees/>).

Educational Specialists Degree

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.

Graduate Certificates

A graduate certificate comprises a set of credit-bearing graduate courses representing a specific subject area. Graduate certificates are designed for post-baccalaureate students seeking to enhance their educational portfolio. See Graduate Certificates (<https://catalog.unl.edu/graduate-professional/programs/grad-cert/>) for course requirements.

A graduate certificate requires at least 12 hours of graduate coursework past the bachelor's degree, but not more than 20 hours. For students pursuing more than one certificate, sharing of credits is limited to 3 hours, provided each certificate has a minimum of 12 hours of non-shared credits. Shared credits cannot count toward more than two certificates. **The minimum grade for certificate courses must meet the Scholastic Grade Requirements (p. 22) for graduate-level courses.** Courses taken to fulfill requirements for a graduate certificate and later applied toward

a graduate degree must meet the minimum grade requirements for the degree, which may be higher.

Admission to and enrollment in a graduate certificate program occurs independently of graduate (master's and doctoral) degree programs. Students may pursue a graduate certificate and graduate degree simultaneously, although concurrent enrollment is not required. Certificate courses taken at the University of Nebraska may count toward a graduate degree. Courses taken and applied toward a previously awarded graduate degree or certificate cannot be counted toward a future graduate certificate. Courses completed at institutions other than the University of Nebraska cannot count toward a graduate certificate.

Endorsements and Teaching Certification

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. 521) or consult UNL's certification officer (<http://cehs.unl.edu/cehs/renewing-your-teaching-certification/>).

Guidelines for Probation and Termination

The University of Nebraska-Lincoln ("UNL") may modify these guidelines from time to time within its discretion, without prior notice, and shall be the sole determiner as to how these guidelines are interpreted.

Basis for Taking Academic Action

Graduate students at UNL are expected to maintain a high level of achievement in their graduate studies and to adhere to the Student Code of Conduct and all relevant policies. Accordingly, UNL reserves the right to act with respect to any graduate student who fails to maintain satisfactory progress or who violates any provision of the Student Code of Conduct or relevant policy. Such action may include, without limitation, placing the student on academic probation, suspending or terminating the student from a degree or certificate program, or precluding the student from pursuing any further graduate studies at UNL.

Academic action may be taken against a graduate student based on any of the following:

1. Violation of the Student Code of Conduct (<https://studentconduct.unl.edu/student-code-conduct/>) or any other UNL, college or departmental policy. A violation of the Student Code of Conduct may be used as a basis for terminating a student from a program only after the violation has been reported and properly confirmed;
2. Unsatisfactory academic performance, including failing to satisfy UNL's Scholastic Grade Requirements (p. 22); failing to pass qualifying examinations, preliminary examinations, comprehensive examinations or final degree examinations; failing to master the methodology and content of one's field in a manner that is sufficient to successfully complete a thesis or dissertation; or
3. Failing to satisfy the requirements for the removal of probationary status or conditional admission.

Graduate Committees may adopt and impose additional conditions under which a graduate student may be subject to academic action, provided that such conditions are approved in advance by the Dean for Graduate Studies and are communicated in writing to all students who

are subjected to those conditions. Graduate programs shall include any additional conditions in the program's governance documents.

A graduate student who is terminated from one degree or certificate program may apply to a different degree or certificate program, except when the termination is based on a violation of the Student Code of Conduct or when the student is precluded from pursuing any further graduate studies at UNL.

Procedure for Academic Action

Academic action taken against a graduate student is initiated by the department, school or interdepartmental Graduate Committee, whether acting alone or upon the recommendation of the student's advisor or supervisory committee.

A decision to place a student on probation will be shared with the student and forwarded to the Dean for Graduate Studies. Conditions of the probation will be communicated to the student in writing.

A recommendation to terminate a student's degree or certificate program or preclude the student from pursuing any further graduate studies at UNL will be addressed in the following manner:

1. The Graduate Committee Chair will promptly inform the student in writing of the recommendation, the reason(s) given for the recommendation, and the name of the individual(s) making the recommendation.
2. The Graduate Committee Chair will provide the student with the opportunity to confer directly with the individual(s) making the recommendation through an in-person meeting or a telephone or video conference. *The student will be given at least one-week advance notice of this meeting or conference.*
3. The student will be granted the opportunity to respond to the recommendation verbally or in writing, or both, which will be documented and taken into consideration by the Graduate Committee Chair. The Graduate Committee Chair will consider any extenuating circumstances communicated by the student and will seek to determine whether the matter can be resolved.
4. After considering the student's response, if the decision is made to proceed with the recommendation to terminate the student's program or preclude the student from pursuing any further graduate studies, the Graduate Committee Chair will inform both the student and the Dean for Graduate Studies of that decision in writing, including the basis of the decision.
5. The Dean for Graduate Studies will investigate the matter within 30 days and decide whether to proceed with terminating the student's program or precluding that student from pursuing any further graduate studies at UNL.
6. If the Dean for Graduate Studies decides to proceed with terminating the student's program or precluding that student from pursuing any further graduate studies at UNL, the Dean will inform the student of that decision in writing and advise the student of the right to appeal the decision.

Appeal of Academic Action

A graduate student who is terminated from a program or is precluded from pursuing further graduate studies as a result of a decision rendered by the Dean for Graduate Studies may appeal that decision to the UNL Graduate Council, which will serve as the appeals board.

1. To initiate an appeal, the student must submit a written request for an appeal to the Dean for Graduate Studies, who will act as the

chair of the UNL Graduate Council, within thirty (30) calendar days after receiving the Dean's decision. Although the Dean for Graduate Studies serves as the chair of the UNL Graduate Council, the Dean will not participate in deliberations leading to, nor vote on, the appeal decision of the UNL Graduate Council.

2. The affected student is responsible for submitting all information that the student wants the UNL Graduate Council to consider as part of the appeal. The written appeal must include the following:
 - a. A full description of the basis on which the student is bringing the appeal;
 - b. A full description of the remedy being sought by the student; and
 - c. Copies of all documentation supporting the student's appeal.
3. After taking into consideration all information and documentation submitted by the student in conjunction with the appeal, and taking into consideration the letter(s) recommending probation or termination, the UNL Graduate Council will render its decision. That decision will be communicated in writing to the student, the individual(s) who made the initial recommendation, and the Graduate Committee overseeing the student's graduate program. In most cases, this decision will serve as the final decision.

Appeals to the Executive Graduate Council

In most cases, the decision of the UNL Graduate Council will be final. Only under special circumstances will the Executive Graduate Council hear an appeal from the decision of the UNL Graduate Council.

1. 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:
 - a. That the UNL Graduate Council has violated some element of fair procedure (example: has failed to allow the parties concerned to present their cases fully to the UNL Graduate Council);
 - b. That the UNL Graduate Council has failed to examine or give adequate weight to important evidence relevant to one party's position;
 - c. That the UNL Graduate Council has given undue weight to evidence not pertinent to the case; or
 - d. That some gross miscarriage of justice would be perpetrated if the decision of the UNL 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.

1. 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 twenty (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).
2. The Executive Graduate Council must make a decision to hear the appeal or not to hear the appeal within thirty (30) working days after receipt of the appeal. Acceptance or denial of jurisdiction over the appeal will be made in writing.
3. The decision of the Executive Graduate Council on the merits of the case will be made and transmitted to the concerned parties within forty (40) working days after the decision to hear the appeal.
4. No person who was a member of the department or UNL 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.

SOURCE: General appeal procedures established by the Executive Graduate Council (December 11, 1980; amended March 18, 1982)

SOURCE: Grounds for probation and termination established by the UNL Graduate Council (February 12, 1992; amended March 11, 2004)
Edits reviewed by the Office of General Counsel (October 11, 2019)
Edits approved by the UNL Graduate Council (February 6, 2020)

Registration

SUMMARY

Minimum enrollment requirements for certain statuses or outcomes are as follows. Full-Time Certification (p. 19) 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 |

Procedures and Dates

Academic Calendar (<https://registrar.unl.edu/academic-calendar/>)

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 (<https://catalog.unl.edu/graduate-professional/policies/academic-program-requirements/#candidacy>). Failure to maintain registration may result in the termination of the student's program.

Credit Hour Requirements

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

Graduate students may request full-time certification 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. Master's degree-seeking students must have an approved Memorandum of Courses on file with the Office of Graduate Studies and must be pursuing a specific major under Option A (thesis); Doctoral degree-seeking students must be in candidacy.
- **Limitations:** Master's students may use full-time certification no more than three terms, doctoral candidates may use it no more than six terms.

Request Form (<https://go.unl.edu/gradfulltime/>)

Minimum Registration for 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 and Registration

Assistantships, Fellowships, and Traineeships

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.

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

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 Letter of Admission. Students may apply for residency for tuition purposes in MyRed (<https://myred.nebraska.edu/psp/myred/NBL/HRMS/?cmd=login>).

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.

Tuition Remission for GRADUATE ASSISTANTS

Students holding a benefits-eligible graduate assistantship (p. 23) 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/>).

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.

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.

Withdrawal

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.

Download: Petition for late withdrawal (https://www.unl.edu/gradstudies/docs/petition_for_late_withdrawal.pdf)

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.

Graduate Credit

Courses with Graduate Credit

Courses taught at UNL must comply with the accreditation standards of the Higher Learning Commission. Specifically, UNL must ensure that: (1) Courses and programs are current and require levels of student performance appropriate to the credential awarded, and (2) the institution articulates and differentiates learning goals for its undergraduate, graduate, post-baccalaureate, post-graduate and certificate programs. (*SOURCE: HLC Criteria for Accreditation*)

Courses numbered 500-599, 600-699, and 700-799 are reserved for Architecture, Law, Dentistry, Medicine, and other professional school offerings. Courses numbered 800-899 and 900-999 are graduate-level. Law courses carry graduate credit only if the letter "G" follows the course number.

Safeguarding the integrity of graduate education requires graduate courses to have characteristics common to all disciplines. These characteristics differentiate graduate courses from undergraduate courses by having more advanced graduate-level work and student performance expectations, not by the level of those enrolled. Therefore, all graduate courses are expected to reflect the high standards of graduate education by requiring students to:

- Demonstrate a greater depth of knowledge, understanding, and independence than is normally required for undergraduate students in the discipline.
- Demonstrate advanced skill, methodology, and competence than is normally required for undergraduate students in the discipline.
- Demonstrate a greater degree of analysis, synthesis, and critical thought than is normally required for undergraduate students in the discipline.

The diversity of graduate programs may necessitate interpretation of these characteristics within the context of a specific discipline. There is no intent to eliminate judgment by establishing an inflexible set of

rules; however, proposers of new graduate courses are expected to offer a thorough explanation when deviating from the criteria required for graduate courses.

Courses with Undergraduate and Graduate Credit

So-called “dual-level,” “cross-listed” or “graduate tie-in” courses occur when an undergraduate and graduate course are offered at the same time, with the same instructor, and in the same physical or online space. While the classroom experience is shared between the undergraduate and graduate students, dual-level courses are expected to have differentiated content, learning goals, and assessment measures that are distinct. Students enrolled at the graduate level shall be held to higher academic standards than undergraduate students in the same course, consistent with the Higher Learning Commission criteria for accreditation.

The syllabus of a dual-level course must clearly distinguish the undergraduate and graduate components. In addition to the components required by the UNL Syllabus Policy (<https://www.unl.edu/facultysenate/unl-syllabus-policy/>), a dual-level course syllabus must describe the graduate level objectives, content, and performance expectations that are different from the undergraduate components. Students enrolled at the graduate level are expected to do more challenging work, not just more work. The syllabus must also describe assessment measures that are unique to students enrolled at the graduate level, including a grading rubric (if applicable), the value distribution (as points or percentages) for each assignment and examination, and any other performance measure specific to the graduate-level work.

A student cannot enroll in a dual-level course at the graduate level if they previously received credit at the undergraduate level. A dual-level course completed and recorded on transcripts at the undergraduate level cannot be retroactively changed to the graduate course.

Accessibility of Graduate Courses

UNL is committed to creating a climate that emphasizes, prioritizes, and expands inclusive excellence and diversity in higher education (*SOURCE: N2025 Strategic Plan*). Instructors of graduate courses should reflect this commitment by ensuring accessibility. Course syllabi, assignments, examinations, materials, and other resources should be designed with accessibility in mind to meet the needs of diverse learners. Instructors are encouraged to develop content and adhere to practices that do not intentionally or unintentionally introduce learning barriers by:

- Using inclusive language in course documents and interactions with students, including respecting students' preferred name and pronouns and avoiding unnecessary gendered course content.
- Ensuring that required course materials such as books and supplies are appropriate, essential, and available at low or no cost whenever possible.
- Informing students of relevant accessibility information such as library resources, institutional health and food safety resources, institutional offices and centers of support, and critical phone lines (e.g., campus emergency, suicide prevention, sexual violence response, etc.).
- Practicing inclusive teaching and course management. For example, consider using late work strategies and flexible assessments that support the academic success of low income students and students with disabilities, noting that disabled students are often unaware of

their own disability, lack the economic resources to provide proof of disability, and are often discouraged by the stigmatization of disability in society.

- Reviewing the available scholarly literature, relevant policies, and institutional training related to diversity, access, and inclusion in higher education (See: UNL Office of Diversity and Inclusion Resources (<https://diversity.unl.edu/>)).

Course proposers are also encouraged to incorporate these and other evidence-based actions to enhance the diversity, inclusion, and accessibility of academia in their proposed syllabus.

In this manner, instructors at UNL are to remain informed and aware of the multitude of barriers to success in higher education (e.g. historical, cultural, economic, systemic, logistical), as well as of practices to mitigate said barriers in order to effectively practice inclusive pedagogy.

SOURCE: UNL Graduate Council Minutes (February 4, 2021)

Credit by Examination

Credit by examination cannot be earned in graduate-level courses or applied to graduate degree programs.

Transfer Credit

All graduate credits to be counted toward the satisfaction of post-baccalaureate degree requirements, including all transfer credits, must be recommended by the cognizant graduate committee of the student's major department or area. Not less than 50 percent of the course work (excluding thesis) required for any post-baccalaureate graduate degree must be completed at the University of Nebraska. No graduate credits will be accepted as transfer credits unless earned at an institution fully accredited to offer graduate work in the field of the student's major; nor shall any graduate credits to be transferred unless the graduate committee evaluates the quality and suitability and determines that they are equal to or superior to offerings available at the University of Nebraska. (*SOURCE: Executive Graduate Council Minutes, April 3, 1975; amended November 30, 2011*)

No graduate credits will be accepted as transfer credit toward a master's program at UNL if the course work is 10 years or older or if the course work has been applied toward a previously completed post-baccalaureate degree at any institution, including UNL. Similarly, no graduate credits will be accepted as transfer credit toward a doctoral program if the course work has been applied toward a previously completed doctoral degree at any institution, including UNL. Professional courses cannot count toward a graduate degree. Courses completed at institutions other than the University of Nebraska cannot count toward a graduate certificate.

Approval of the Office of Graduate Studies is required for the transfer of graduate work taken elsewhere toward a graduate degree at the UNL. It is the student's responsibility to ensure that official transcripts of graduate work taken elsewhere are received in the Office of Graduate Studies well before the student plans to complete all other requirements for the graduate degree at UNL.

Graduate Credit for Undergraduates

Seniors at UNL may be permitted up to 12 hours of credit for graduate courses, provided that these credits are earned the calendar year prior to receipt of the baccalaureate. The student should consult Scholarships and Financial Aid (<http://financialaid.unl.edu/>) regarding continuation of any undergraduate scholarships or financial aid.

Before registering for a graduate course, a senior must obtain approval from Graduate Studies using the Request for Graduate Credit (<https://go.unl.edu/gradcredit/>) form, indicating whether the course will be used toward the bachelor's degree. If used in the bachelor's degree, the course cannot also be used toward a future graduate program unless the student is accepted into, and the courses are part of, an Accelerated Master's Program. Graduate courses taken prior to completion of a bachelor's degree do not always transfer as graduate credit to other institutions, nor are they guaranteed by Graduate Studies to apply toward a UNL graduate program.

SOURCE: Executive Graduate Council Minutes (September 26, 1974; amended April 25, 2018)

Accelerated Master's Admission Eligibility

Undergraduate students may apply to an Accelerated Master's Program during their sophomore year. Full admission to the master's program will follow the completion of the bachelor's degree requirements. Departments, schools, or colleges at UNL offering an Accelerated Master's Program will select from among eligible undergraduates meeting the minimum requirements established by the UNL Graduate Council. Individual programs may impose more rigorous requirements in addition to the following minimum requirements:

1. Undergraduate grade point average (GPA) of 3.0 or higher.
2. Maintain enrollment as a full-time undergraduate student.
3. Submission of a graduate application and payment of a graduate application fee.

Enrollment Criteria

Once admitted to the Accelerated Master's Program, students will be considered undergraduates until they complete the undergraduate degree requirements.

1. Prior to receiving the undergraduate degree, students may take up to 12 credit hours of approved graduate coursework that applies toward both the bachelor's and master's degrees. Students will be charged the graduate tuition rate for graduate courses applied to the bachelor's degree.
2. Prior to receiving the undergraduate degree, students retain eligibility for undergraduate scholarships and financial aid.
3. Students in an accelerated program are expected to meet the academic requirements of the graduate degree program.
4. After completion of all bachelor's degree requirements, students will be enrolled in the Graduate College, be charged at the graduate tuition rate, and be eligible for graduate assistantships and fellowships.
5. After completion of all bachelor's degree requirements, students must take at least 18 credit hours at the graduate level to meet master's degree requirements.

Coursework Requirements

1. No more than 12 credit hours of graduate coursework may count toward both the bachelor's and master's degrees. The graduate courses must be currently offered.
2. Students may choose 12 hours from the 15-18 credit hours approved at the time of proposal. No course substitutions are permitted.
3. Courses must be currently and regularly offered.
4. Students may not take 900-level courses.
5. Dual-listed courses (400/800) are acceptable, but not required. If dual-listed courses are included in the Accelerated Master's

Program, students must register at the 800-level and complete all graduate-level requirements. Dual-listed courses previously taken and completed at the 400-level will not be retroactively changed to the 800-level.

SOURCE: Executive Graduate Council Minutes (October 3, 2019; amended September 6, 2022)

Grades Grading System

The University uses an A through F grading system. The letter grades with point value (in parentheses) are: 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), and F (0). Grades without point value are: W (dropped/withdrew), I (incomplete), P (pass/C or better), and N (no pass). The grade of IP (in progress) and XP (no progress) are used exclusively for thesis and dissertation hours (course number 899 and 999, respectively) and have no point value.

Graduate students taking undergraduate classes for deficiencies generally have a grade requirement set by the department. However, if no specific standard has been set, graduate students are required to meet the same standard set for undergraduate students. If the class is taken Pass/No pass, the equivalent of a C or better is required to receive a grade of P.

Scholastic Grade Requirements

The following minimum grades are required to earn credit in graduate-level courses:

| | Courses in the major department or area applied toward a degree | All other courses applied toward a degree or a graduate certificate |
|--|---|---|
| 800-level with 400 or lower counterpart | B | C or P |
| 900-level and 800-level without 400 or lower counterpart | C or P | C or P |

The comprehensive exam for the minor may be waived if all grades in the minor are at least a B or P. Courses taken to fulfill requirements for a graduate certificate and later applied toward a graduate degree must meet the minimum grade requirements for the degree, which may be higher. Grades below the minimum requirement cannot be applied toward a degree or graduate certificate. Students failing to receive a minimum acceptable grade may not continue their program of studies without permission of their supervisory committee or the departmental graduate committee.

Incomplete ("I") Grade

The I grade should be used only when a student is unable to complete a course due to illness, military service, hardship, or death in the immediate family. Incompletes will be given only if the student has substantially completed the major requirements of the course. (*SOURCE: University Registrar Policy; updated October 6, 2016*)

The I grade is assigned at the discretion of the instructor in consultation with the student. The instructor determines the requirements for completing the course and requisite date for removal of the incomplete. These requirements should be in writing to prevent miscommunication.

The student should not re-register for an incomplete course when attempting to complete course requirements. 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 Department Chair or Graduate Committee Chair will assume the role of the instructor.

Incomplete graduate courses listed on the *Memorandum of Courses* or *Program of Studies* must become graded prior to graduation. When requirements are satisfied, the instructor replaces the I with a grade indicating completion. If an incomplete course is not listed on the *Memorandum of Courses* or *Program of Studies* and not used toward degree requirements, it may remain incomplete. In such cases, the I grade will remain on the student's transcript, but will not affect the GPA. Undergraduate courses receiving an I grade will be changed to an F after one calendar year.

The I grade should not be used for thesis and dissertation hours or for courses that span multiple semesters in which students are making adequate progress.

In Progress ("IP") and No Progress ("XP") Grades

The IP and XP grades shall be used exclusively for thesis and dissertation hours (course number 899 and 999, respectively) prior to the student's final semester.

The IP grade indicates satisfactory work in progress or effort as determined by the student's advisor and/or supervisory committee. The IP grade will stand until the final examination, at which time a grade of P or a letter grade for all thesis and dissertation hours is submitted to the Office of the University Registrar.

The XP grade indicates lack of satisfactory progress as determined by the student's advisor and/or supervisory committee. Consecutive XP grades may result in the graduate committee taking action to inform the student and Graduate Studies regarding continuation of the student's graduate study. No direct academic action will be imposed for earning one or more XP grades. However, departments may use a series of XP grades as a basis for recommending termination of the student from a graduate program. Departments and programs should establish these criteria and document them fully in their graduate student handbooks.

SOURCE: UNL Graduate Council (October 9, 2014)

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 Committee 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 for Graduate Studies 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: UNL Graduate Council (March 9, 1993; revised August 16, 2018)

Funding

Assistantships

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.

Responsibilities

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 (<https://studentaccounts.unl.edu/student-health-insurance/>) 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 (<https://www.unl.edu/gradstudies/funding/assistantships/>).

Non-Benefits-Eligible Assistantships

A student on a non-benefits-eligible graduate assistantship may qualify for reduced summer tuition 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. 18) for funded students.

Departments must provide students with an official signed offer letter (<https://www.unl.edu/gradstudies/funding/letters/>), 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 Graduate Teaching Assistants

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

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/>).

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.

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.

Continuation

Continuation of graduate fellowships may be denied to recipients under any of the following conditions:

- Failure to satisfy Scholastic Grade Requirements (p. 22).
- Violations of the Code of Conduct (p. 3).

- Failure in qualifying examinations, preliminary examinations, comprehensive examinations or failure to make satisfactory progress as defined by the graduate program.

Impact on Other Funding

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

Scholarships and Financial Aid

The Office of Scholarships and Financial Aid (OSFA) (<http://www.unl.edu/scholf/a/>) does not participate in the granting of fellowships or assistantships but does maintain current information on **other forms of financial support** available to students.

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/>).

Tuition remission of up to 12 hours may be provided to graduate assistants who are paid the minimum qualifying salary in the preceding academic year. Graduate assistants who start in the spring or summer semester and have a qualifying fall appointment may receive tuition remission in the summer. Specific dollar amounts are available each year in the Guidelines for Graduate Assistantships

Faculty

Authority and Responsibilities

The authority and responsibilities of the Graduate Faculty shall include adoption of attendance rules, determination of requirements for graduation in all Graduate College programs, recommendations of candidates therefore, developing research and extension programs, discipline of students for conduct solely affecting the College, and providing to the Board of Regents recommended admission requirements, courses of study, and other relevant material for meeting statutory requirements.

Membership Graduate Faculty

The Graduate Faculty may vote on any matter presented to the Graduate Faculty, including the election of the Graduate Council for their specific campus. They may also hold any elected office in the Graduate College. Graduate Faculty may teach graduate courses, serve on final examining committees, and serve on supervisory committees. Graduate Programs may have additional written criteria, approved by the campus Dean for Graduate Studies, for participation on doctoral (Ph. D., Ed.D., etc.) supervisory committees. Graduate Faculty have the additional responsibility of voting on certain nominations of Graduate Faculty in their department/school or interdepartmental area program. Graduate Faculty status is not required to teach graduate courses that are solely part of a Post-Baccalaureate Professional Credential or when a specific

graduate-level course has learning outcomes, deemed by the applicable Program and confirmed by the campus' Dean of Graduate Studies, to primarily focus on educating students in the practice of a given profession or discipline

Emeriti Faculty

1. Upon the 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 status as Graduate Faculty. 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. Emeriti faculty must be reappointed to the Graduate Faculty every four years by the departmental school Graduate Committee and approved by the departmental school Chair or Head and by the respective campus Dean for Graduate Studies, University of Nebraska. Any compensation decision continues to reside with the department/school.

Graduate Faculty Associate

1. Graduate Faculty Associates may teach graduate courses, direct masters theses, serve on or chair masters examining committees, and serve on doctoral supervisory committees. Associate status is primarily designed to provide an opportunity for faculty to contribute towards the education of graduate students in their discipline, while they simultaneously develop the credentials to become eligible for Graduate Faculty status. In addition, Associate status is appropriate for faculty whose professional background or assigned instructional responsibilities are such that their contribution towards graduate education is highly valued, but they are otherwise not likely to seek or be eligible for Graduate Faculty status.
2. Graduate Faculty Associate status may be granted upon recommendation of the Graduate Faculty affiliated with a specific department or interdepartmental area and with approval by the campus Dean for Graduate Studies. Graduate Faculty Associates may teach graduate courses, direct masters theses, serve on or chair masters examining committees, and serve on doctoral supervisory committees. Graduate Faculty Associate status is granted for a specific initial term, not to exceed a period of four years from the start of the staff member's faculty appointment or their proposed involvement in a specific graduate program. Associate appointments may be renewed for additional terms(s) of four years each after obtaining a new recommendation of the Graduate Faculty affiliated with a specific department or interdepartmental area and with the approval by the campus Dean for Graduate Studies.
3. Any waivers or extensions to these provisions must be approved by both the campus Dean of Graduate Studies and the Dean of the Graduate College

Adjunct Faculty

Upon recommendation of the departmental/school or interdepartmental Graduate Committee, Adjunct Faculty previously holding Graduate Faculty status while employed by the University of Nebraska, may retain certain rights and privileges intended to aid in successful degree completion of University of Nebraska students previously under their formal mentorship. Adjunct Faculty, not previously employed by the University of Nebraska or former employees no longer holding Graduate Faculty status, must be considered for Graduate Faculty status as per Section D.2, on the following page.

1. Adjunct Faculty with Graduate Faculty status may teach graduate courses, serve as members of graduate programs, and co-chair the supervisory committees of doctoral students with a resident Graduate Faculty member. Adjunct Faculty have no campus wide or Graduate College voting privileges outside their supervisory committee work
2. All Adjunct faculty with Graduate Faculty status must be reappointed to the Graduate Faculty every four years by the departmental school Graduate Committee and approved by the departmental school Chair or Head and by the respective campus Dean for Graduate Studies
3. Any compensation decision continues to reside with the department/school.

Graduate Lecturers

Graduate Lecturers are non-tenure track faculty who are nominated and appointed to serve in a limited capacity. Graduate Lecturers may teach graduate courses, serve as academic advisors, and supervise students in graduate-level courses related to professional training such as clinical, field experience, practicum, internship and laboratory courses.

Procedure for Requesting Graduate Lecturers

1. Eligible faculty members must hold the terminal degree normally accepted for academic employment in the discipline OR have achieved some extraordinary accomplishments as determined by the graduate committee of the nominee's department.
2. Nominee must have completed at least two years of work experience relevant to the discipline to be taught. This may include teaching, research, clinical or other professional experience.
3. Using the request form for graduate lecturers (https://graduate.unl.edu/facstaff/Graduate_Lecturer_Appointment_Form-fillable.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, (2) the nominee's curriculum vitae, and (3) a memo from Graduate Committee Chair explaining the reasons for the nomination.

SOURCE: Graduate Council Minutes (September 8, 1982; January 17, 2019)

Criteria for Membership Graduate Faculty

A faculty member nominated for appointment as a Graduate Faculty member must meet the following minimum requirements

1. Hold the rank of Senior Lecturer (or instructor at UNMC), Assistant Professor 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 their regular duties; and have demonstrated clear evidence of continuing research/creative activity and potential in the discipline. Such research/creative activity should be of a quality that would be recognized nationally within the discipline and may include the creation of new knowledge or innovative application of existing knowledge.

Procedures for Appointment

Appointment as Graduate Faculty without Application

New faculty in departments/schools with graduate degrees. All new University of Nebraska faculty members who meet the required criteria and are to be appointed to specific term, health professions or continuous appointments in academic departments/schools that house a graduate degree granting program (masters, doctoral, or both) will automatically be appointed as Graduate Faculty. No application process will be required. All new faculty in this category will be appointed as Graduate Faculty in their letter of appointment at the time of hire, contingent upon the approval of the campus Dean for Graduate Studies

Faculty Who Must Apply to be Designated Graduate Faculty

Faculty in departments/schools not granting graduate degrees. With the exception of new faculty appointed as Graduate Faculty without application under Section D. 1, all current University of Nebraska faculty members in academic departments/schools that currently do not house a graduate degree granting program (masters, doctoral, or both) must apply to be appointed as Graduate Faculty. Individuals with Faculty Practice, Faculty Research, or Special Appointments [including senior lecturer, instructor (at UNMC) and adjunct faculty]. All University of Nebraska faculty members on Special Appointment, Faculty Practice Appointment, or Faculty Research Appointment in any academic department/school (whether it houses a graduate degree program or not) must apply to be appointed as Graduate Faculty.

Process for Applying to Become Graduate Faculty

1. Eligible faculty members will utilize the following process to apply for status as Graduate Faculty (see Appendix 2 of Graduate College Bylaws and Policies (<https://nebraska.edu/-/media/unca/docs/offices-and-policies/policies/policies/graduate-college-policy-handbook.pdf>)):
 - a. Submit an application form and vita to the chair of the Graduate Committee in the relevant department/school or interdepartmental program.
 - b. All Graduate Faculty in the relevant department/school will vote on the application. A two-thirds majority of these Graduate Faculty must support the nomination in order for it to be forwarded to the campus-level Dean for Graduate Studies. The chair of the Graduate Committee will write a letter interpreting the department/school vote (i.e., explaining the reasons for supporting the nomination), and then forward the file to the nominee's department chair for endorsement and certification to the campus Dean for Graduate Studies.
 - c. For faculty in departments/schools without graduate programs, or for interdepartmental and/or intercampus programs, or in departments/ schools with graduate programs with fewer than six Graduate Faculty, a six-person review committee of Graduate Faculty will be appointed by the campus Dean for Graduate Studies. The chair of the committee will write a letter to the campus graduate studies dean(s) explaining the reasons for supporting the nomination. A two-thirds or greater majority of the committee must support the nomination. In the case of interdepartmental and/ or intercampus graduate programs, the director of the program will recommend members to the campus Dean(s) for Graduate Studies.
 - d. The campus Dean for Graduate Studies will then review the nomination, and either approve or defer it. If approved, the nomination is forwarded to the Dean of the Graduate College.
 - e. The Dean of the Graduate College will then review the nomination and either approve or defer the nomination. If approved, the Dean formally appoints the faculty member to Graduate Faculty status.

Special Procedures

If there is no graduate program in a particular discipline on a given campus, or if the number of Graduate Faculty in a particular discipline is fewer than six, a person in that discipline on that campus may be nominated for Graduate Faculty status by any Graduate Faculty member in that discipline or a related discipline on that campus or another campus. Such nominations must be recommended by either two-thirds vote of the Graduate Faculty of the corresponding department/school on another campus, or by two-thirds vote of a special ad hoc committee of six Graduate Faculty that shall.

1. include all the Graduate Faculty in the nominee's department/school or interdepartmental area, with the remainder being Graduate Faculty from the same campus or similar departments/schools or interdepartmental areas from the same campus; and
2. be appointed by the campus Dean for Graduate Studies from names submitted by the nominator.
3. In all cases, nominations for Graduate Faculty shall be submitted from the groups indicated above to the campus Dean for Graduate Studies for approval. If the campus Dean approves a nomination, it shall be submitted to the Dean of the Graduate College for approval.

Procedure of Appeal

1. Any nominee, or nominator only with the written permission of the nominee, who believes that their nomination has not been properly acted upon by the departmental/school or interdepartmental and or intercampus Graduate Committee, or the chairperson thereof, or departmental chairperson/school director, or college dean, may appeal to the campus Dean for Graduate Studies, who may wish to refer the appeal to the campus Graduate Council for advice. A nominee, or nominator only with the written permission of the nominee, who believes that their nomination has not been properly acted upon by a campus Dean for Graduate Studies may appeal to the Dean. The nominee, or nominator only with the written permission of the nominee, may at their discretion discuss the nomination under appeal with either the campus Dean for Graduate Studies or the Dean. In the event that such a meeting is scheduled, both the nominee and the nominator may attend.
2. The Executive Graduate Council shall serve an appellate function when a nominee, or nominator only with the written permission of the nominee, believes that their nomination has been improperly deferred by the Dean. If the Executive Graduate Council upholds the deferral, that decision shall be final. If the Executive Graduate Council recommends that the Dean's previous decision to defer be reversed, the nomination shall be returned to the Dean with a recommendation that it be approved. If the Dean does not approve it, the nomination and all accompanying documents shall be forwarded to the President for final disposition. Decisions on appeals forwarded by Council approval must be made within twenty (20) working days.
3. The nominee, or nominator only with the written permission of the nominee, must file any appeal of any deferral of their nomination within twenty (20) working days after notification of such deferral.

4. Only data that accompanied the original nomination may be considered at any level of an appeal.
5. Even though a particular nomination is under appeal, a new nomination containing additional information may be submitted to the campus Dean for Graduate Studies at any time without prejudicing the appeal. The appeal will then be held in abeyance during the period that the new nomination is being considered by the campus Dean.

Graduate and Supervisory Committees

Graduate Committees

Each department/school or interdepartmental/ intercampus area offering major work leading to the master or doctoral degree shall have a Graduate Committee consisting of not fewer than three Graduate Faculty, one of whom shall serve as chairperson of the Committee.

All Graduate Committees must have at least a two-thirds majority of Graduate Faculty on the Committee and its chairperson must be a member of the Graduate Faculty. For graduate programs involving only one department/school, membership on the Graduate Committee shall be recommended by the Graduate Faculty of the department/school through its departmental chairperson/school director, for approval and appointment by the campus Dean. For graduate programs involving more than one department/school and or campus, membership on the Graduate Committee shall be recommended by the participating Graduate Faculty of the participating departments/schools through the chairperson of the interdepartmental/intercampus area committee, or, if no such committee exists, through the chairpersons of the participating departments/schools, for approval and appointment by the campus Dean(s). Graduate Committees are responsible for the general supervision of graduate work in their departments/schools, and/or interdepartmental intercampus areas.

Graduate Committee Chairs act as the liaison between their Graduate Committees and the Dean for Graduate Studies. Within their purview, the Committee Chair is charged with ensuring fair and consistent compliance with all Graduate College, and campus policies that govern graduate education from recommending admission through awarding of credentials. The Committee Chair coordinates the oversight of all graduate degrees, majors, specializations, minors, and certificate programs to ensure that every graduate student and member of the graduate faculty is held to the highest standards of academic integrity.

Supervisory Committees

For each student who has been accepted by a departmental/school or interdepartmental/intercampus area for doctoral studies there shall be a Supervisory Committee, of at least four members, all of whom shall be Graduate Faculty. Additional members may be appointed to the Committee, either being non Graduate Faculty or Graduate Faculty. Graduate Faculty have voting privileges, while non-Graduate Faculty do not. Membership on Supervisory Committees shall be recommended by the departmental school or interdepartmental intercampus Graduate Committee for approval and appointment by the campus Dean(s). Graduate programs may have additional written criteria, approved by the campus Dean for Graduate Studies, for participation on doctoral supervisory committees. The minor, or related fields, if applicable, shall be represented on the Committee. The Committee shall approve the student's program of studies, monitor the student's academic and research or creative activity progress, approve the dissertation subject,

prepare, give, and evaluate the comprehensive and final examinations, and approve the dissertation.

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)

Meetings

1. The Graduate Faculty as a whole shall be called into special session by a majority vote of the Executive Graduate Council, or by a petition signed by any 100 members of the Graduate Faculty. The quorum for meetings of the Graduate Faculty shall be ten percent of the voting membership of the Graduate Faculty. Provided a quorum is in attendance, all actions taken at such meetings under the category of new business, or agenda items supported by a majority, but less than a two-thirds majority of those present at such meetings, must be submitted to the Faculty of the Graduate College on a mail or electronic ballot. Any agenda item ratified by a two-thirds majority shall be policy and shall not be sent to the Graduate Faculty on a mail or electronic ballot, unless specifically requested by a majority of those present at the meeting.
2. Ten members of the Graduate Faculty may petition to place items on the agenda for meetings of the Faculty of the Graduate College, if such items are presented in writing to the Dean of the Graduate College at least three weeks prior to the meeting. Items to be voted on must be submitted as written motions with proper supporting material. If substantial amendments to the written motions are made at the meeting, they shall be considered as new business and shall be submitted to the Faculty of the Graduate College on a mail or electronic ballot. In the absence of a quorum, the agenda items of the proposed meeting of the Graduate Faculty shall be referred to the Executive Graduate Council for consideration.
3. There shall be an alphabetical master list, by campus, of Graduate Faculty available at meetings of the Graduate Faculty for sign-in purposes. The Dean shall appoint a parliamentarian, and Robert's Rules of Order shall be the parliamentary authority for Graduate Faculty meetings. Actions taken by the Graduate Faculty as a whole,

either at a duly called meeting of the Graduate Faculty or by a two-thirds majority of those voting by mail or electronic ballot, shall supersede any action taken by the Executive Graduate Council.

Policy History: Amendments approved by the Executive Graduate Council April 25, 2018, October 26, 2022; approved by a vote of the University of Nebraska Graduate Faculty on May 18, 2018, November 18, 2022; and presented to the Board of Regents on June 28, 2018, December 2, 2022.

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. 75), Landscape Architecture (LARC) (p. 271), Law (LAW) (p. 271), Plant Health (DPLH) (p. 410), Veterinary Medicine (VMED) (p. 501).
- For **undergraduate courses** (0-499) see instead Undergraduate Catalog: Courses (<https://catalog.unl.edu/undergraduate/courses/>).

A

- Accounting (ACCT) (p. 30)
- Actuarial Science (ACTS) (p. 34)
- Advertising and Public Relations (ADPR) (p. 36)
- Agribusiness (ABUS) (p. 38)
- Agricultural Economics (AECN) (p. 38)
- Agricultural Engineering (AGEN) (p. 38)
- Agricultural Leadership Education & Communications (ALEC) (p. 44)
- Agricultural Sciences (AGRI) (p. 48)
- Agronomy (AGRO) (p. 49)
- Animal Science (ASCI) (p. 58)
- Anthropology (ANTH) (p. 64)
- Architectural Engineering (AREN) (p. 71)
- Architecture (ARCH) (p. 75)
- Art History and Criticism (AHIS) (p. 82)
- Art Theory and Practice (ARTP) (p. 85)
- Art-Ceramics (CERM) (p. 85)
- Art-Drawing (DRAW) (p. 86)
- Art-Graphic Design & Illustration (GRPH) (p. 87)
- Art-Painting (PANT) (p. 87)
- Art-Photography (PHOT) (p. 88)
- Art-Printmaking (PRNT) (p. 89)
- Art-Sculpture (SCLP) (p. 89)
- Art-Special Topics (ARTS) (p. 90)
- Art-Watercolor (WATC) (p. 90)
- Astronomy (ASTR) (p. 90)

B

- Biological Chemistry (BIOC) (p. 91)
- Biological Sciences (BIOS) (p. 93)
- Biological Systems Engineering (BSEN) (p. 103)
- Biomedical Engineering (BIME) (p. 107)
- Broadcasting (BRDC) (p. 107)

C

- Chemical and Biomolecular Engineering (CHME) (p. 107)
- Chemistry (CHEM) (p. 111)
- Child, Youth and Family Studies (CYAF) (p. 118)
- Civil Engineering (CIVE) (p. 133)
- Classics (CLAS) (p. 140)
- Communication Studies (COMM) (p. 141)
- Community and Regional Planning (CRPL) (p. 143)
- Community Development (CDEV) (p. 147)
- Computer Science and Engineering (CSCE) (p. 152)
- Construction Engineering (CONE) (p. 161)
- Construction Management (CNST) (p. 162)
- Criminology and Criminal Justice (CRIM) (p. 165)

E

- Economics (ECON) (p. 166)
- Education (EDUC) (p. 172)
- Education and Human Sciences (CEHS) (p. 172)
- Educational Administration (EDAD) (p. 172)
- Educational Psychology (EDPS) (p. 180)
- Electrical and Computer Engineering (ECEN) (p. 190)
- Engineering (ENGR) (p. 198)
- Engineering Management (EMGT) (p. 201)
- Engler Agribusiness Entrepreneurship Program (EAEP) (p. 203)
- English (ENGL) (p. 203)
- Entomology (ENTO) (p. 212)
- Entrepreneurship (ENTR) (p. 217)
- Environmental Engineering (ENVE) (p. 217)
- Ethnic Studies (ETHN) (p. 218)

F

- Finance (FINA) (p. 218)
- Food Science and Technology (FDST) (p. 221)
- Forensic Science (FORS) (p. 227)
- French (FREN) (p. 227)

G

- Geography (GEOG) (p. 230)
- Geology (GEOL) (p. 234)
- Geosciences (GEOS) (p. 239)
- German (GERM) (p. 239)
- Gerontology (GERO) (p. 243)
- Graduate Business Administration (GRBA) (p. 245)
- Graduate College (GRDC) (p. 248)

- Great Plains Study Program (GPSP) (p. 249)
- Greek (GREK) (p. 249)

H

- Hebrew (HEBR) (p. 249)
- History (HIST) (p. 250)
- Horticulture (HORT) (p. 257)
- Hospitality, Restaurant and Tourism Management (HRTM) (p. 264)
- Human Sciences (HUMS) (p. 265)

I

- Integrative Biomedical Sciences (IBMS) (p. 265)
- Interior Design (IDES) (p. 265)

J

- Journalism & Mass Communications-New Core (JOMC) (p. 267)
- Journalism (JOUR) (p. 268)
- Journalism - Graduate (JGRD) (p. 269)

L

- Landscape Architecture (LARC) (p. 271)
- Latin (LATN) (p. 271)
- Law (LAW) (p. 271)
- Life Sciences (LIFE) (p. 330)

M

- Management (MNGT) (p. 330)
- Marketing (MRKT) (p. 335)
- Materials Engineering (MATL) (p. 338)
- Mathematics (MATH) (p. 341)
- Mechanical Engineering (MECH) (p. 348)
- Mechanized Systems Management (MSYM) (p. 357)
- Medieval and Renaissance Studies (MRST) (p. 359)
- Meteorology (METR) (p. 360)
- Modern Languages (MODL) (p. 364)
- Music (MUSC) (p. 365)
- Music - Applied (MUAP) (p. 375)
- Music - Composition (MUCP) (p. 378)
- Music - Ensembles (MUEN) (p. 378)
- Music - Opera (MUOP) (p. 381)
- Music Education (MUED) (p. 382)
- Music Ensemble (credit only) (MUCO) (p. 385)
- Music Ensemble (degree credit) (MUDC) (p. 385)
- MUSR - Music-Student Recitals (p. 385)

N

- Natural Resources (NRES) (p. 385)
- Nutrition and Health Sciences (NUTR) (p. 398)

P

- Philosophy (PHIL) (p. 404)
- Physics (PHYS) (p. 407)
- Plant Health Program (DPLH) (p. 410)

- Plant Pathology (PLPT) (p. 410)
- Political Science (POLS) (p. 412)
- Psychology (PSYC) (p. 415)

R

- Religious Studies Program (RELG) (p. 422)
- Russian (RUSS) (p. 422)

S

- Science Literacy (SCIL) (p. 423)
- Sociology (SOCL) (p. 423)
- Spanish (SPAN) (p. 427)
- Special Education (SPED) (p. 432)
- Speech-Language Pathology and Audiology (SLPA) (p. 440)
- Statistics (STAT) (p. 446)
- Supply Chain Management and Analytics (SCMA) (p. 453)

T

- Teaching, Learning and Teacher Education (TEAC) (p. 456)
- Textiles, Merchandising and Fashion Design (TMFD) (p. 485)
- Theatre Arts (THEA) (p. 492)
- Turfgrass and Landscape Management (TLMT) (p. 497)

V

- Veterinary and Biomedical Sciences (VBMS) (p. 497)
- Veterinary Medicine (VMED) (p. 501)

W

- Water Science (WATS) (p. 505)
- Women's and Gender Studies Program (WMNS) (p. 505)

Accounting (ACCT)

ACCT 801 Fraud Examination and Internal Audit

Prerequisites: Admission to the MPA program or permission

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

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

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

Grading Option: Graded

ACCT 804 Advanced Accounting

Prerequisites: Admission to the MPA program or permission

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

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Graded

ACCT 808 Business Valuation and Financial Statement Analysis

Prerequisites: Admission to the MPA program or permission

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

Grading Option: Graded

ACCT 809 Accounting Information Systems (AIS)

Prerequisites: Admission to the MPA program or permission.

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

Grading Option: Graded

Offered: FALL/SPR

ACCT 813 Corporate Tax Accounting

Prerequisites: Admission to the MPA program or permission

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

Grading Option: Graded

Offered: SPRING

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 adviser 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

Grading Option: Graded

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

Grading Option: Graded

Course and Laboratory Fee: \$20

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

ACCT 831 Seminar in Auditing

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

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ACCT 832 Applied Auditing

Prerequisites: Admission to the MPA program or permission

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Offered: FALL/SPR

ACCT 857 Controllership

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Prerequisites: Admission to the PhD program in Business or Economics or permission

Description: Introduction to methods of conducting scientific research in the social sciences, including hypothesis development and testing, and ethical issues surrounding data gathering and handling, replicability, and use of human participants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ACCT 969 Seminar in Tax Research

Prerequisites: Admission to the PhD program in Business or Economics or permission

Description: Research of the impact of tax information, presentation, and decisions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ACCT 995 Seminar in Audit Research

Prerequisites: Admission to the PhD in Business or Economics

Description: Research of the impact of audit decision and information.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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**Grading Option:** Graded**Prerequisite for:** ACTS 405; ECON 365; FINA 365; FINA 338; FINA 363; FINA 367; FINA 375; FINA 382; FINA 401; FINA 450; FINA 464**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** ACTS 403; ACTS 442, ACTS 842**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**Grading Option:** Graded**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**Grading Option:** Graded**ACTS 875 Actuarial Applications in Practice****Crosslisted with:** ACTS 475**Prerequisites:** ACTS 470/870; 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**Grading Option:** Graded**Offered:** FALL/SPR

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ADPR 833 Art Direction

Crosslisted with: ADPR 433

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

ADPR 834 Digital Insight & Analytics

Crosslisted with: ADPR 434

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

ADPR 837 International/Multicultural Public Relations

Crosslisted with: ADPR 437

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

ADPR 838 Global Advertising

Crosslisted with: ADPR 438

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

ADPR 847 Strategic and Creative Concepting**Crosslisted with:** ADPR 447**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 850 Public Relations Management and Case Studies****Crosslisted with:** ADPR 450**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 851 Public Relations Techniques****Crosslisted with:** ADPR 451**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 857 Crisis Management in Corporations and Nonprofits****Crosslisted with:** ADPR 457**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 858 Interactive Media Design****Crosslisted with:** ADPR 458**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 864 Sports Media Relations & Promotions****Crosslisted with:** ADPR 464, SPMC 464, SPMC 864**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**ADPR 866 Social Media Theory and Practice****Crosslisted with:** ADPR 466**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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

Grading Option: Graded

ADPR 888 Media Sales and Promotion

Crosslisted with: ADPR 488

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

ADPR 889 Advertising and Public Relations Campaigns

Crosslisted with: ADPR 489

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; senior standing and permission code

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

Grading Option: Graded

Course and Laboratory Fee: \$40

Experiential Learning: Community Engagement, Field Studies, Practicums, Research

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: ECON 917

AECN 818 Behavioral and Experimental Economics

Prerequisites: AECN 873

Description: Provides exposure to the related fields of behavioral and experimental economics through lectures and lab-based instruction.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: AECN 416

AECN 856 Environmental Law

Crosslisted with: AECN 456, NREE 456

Prerequisites: Senior standing.

Notes: Available through Online and Distance Education.

Description: Principles of law involved in environmental issues, externalities and market failures, public health, environmental litigation, and legislation. Environmental issues are related to statutory, administrative, and regulatory authorities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 868**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**Grading Option:** Grade Pass/No Pass Option**AECN 872 Mathematical Tools for Applied Economics****Description:** Designed for incoming MS students in Agricultural Economics and related fields. Topics include constrained and unconstrained optimization, Kuhn Tucker conditions, matrices and determinants, and mathematical statistics.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded**Offered:** FALL**AECN 873 Microeconomic Models and Applications****Crosslisted with:** ECON 873**Notes:** Prerequisites: ECON 311, 312 and Math 104 or Math 106 or equivalent, or permission of instructor**Description:** 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Prerequisite for:** AECN 818; AECN 840; AECN 868**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902**AECN 901A Production Economics****Prerequisites:** ECON 912A and 911A**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902; AECN 902A

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902; AECN 902B**AECN 901D International Agricultural Trade****Prerequisites:** ECON 821**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902; AECN 902E**AECN 901E Agricultural Development****Prerequisites:** ECON 912A and 911A**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902**AECN 901J Natural Resource 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:** 3**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AECN 902; AECN 902J**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AECN 902J Natural Resource Economics****Prerequisites:** AECN 901J**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

AGEN 836 Embedded Controls for Agricultural Applications

Crosslisted with: AGEN 436, MSYM 436, MSYM 836

Prerequisites: AGEN/BSEN 260 or MSYM 416

Description: Introduction to the basics of embedded controller programming, and the development of Controller Area Network (CAN) bus systems in agricultural applications. Interfacing sensors with analog and digital signals, closed loop control of actuators, transmission and reception of CAN messages, programming of CAN messages in a distributed controller set up for sensor data acquisition, and actuator control will be studied.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: AGEN 854, MSYM 854; AGEN 953

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

Grading Option: Graded

Offered: SUMMER

AGEN 860 Instrumentation and Controls

Crosslisted with: AGEN 460, BSEN 460, BSEN 860

Prerequisites: ECEN 211 or ECEN 215 or AGEN/BSEN 260

Description: Analysis and design of instrumentation and controls for agricultural, biological, and biomedical applications. Theory of basic sensors and transducers, analog and digital electrical control circuits, and the interfacing of computers with instruments and controls. LabVIEW Programming. Emphasis on signal analysis and interpretation for improving system performance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AGEN 953 Advanced Irrigation and Drainage Systems Engineering****Prerequisites:** AGEN 853, MATH 821**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**Grading Option:** Grade Pass/No Pass Option**AGEN 954 Watershed Modeling****Prerequisites:** BSEN/AGEN 350 & GEOG/NRES 312**Description:** Modeling of runoff, sediment and nutrients of rural and urban watersheds with the Soil and Water Assessment Tool (SWAT), including model calibration, validation and uncertainty.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ALEC 400, ALEC 800; TEAC 905, ALEC 905

ALEC 807 Supervisory Leadership**Crosslisted with:** ALEC 407, CYAF 807**Prerequisites:** ALEC 202 or ALEC 302; Junior standing**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ALEC 811 Principles of Adult Education****Description:** Covering a broad range of topic areas in the field of adult education. Expand understanding of multiple adult learning theories. Connecting theory to practice for those who are responsible for designing and implementing adult education programs for community organizations, leadership organization, and Extension. Focus on how to conduct research in the area of adult education.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**ALEC 819 Public Information Campaigns****Crosslisted with:** ALEC 419**Prerequisites:** Undergraduates: ALEC 207, ALEC 260; Graduates: permission of instructor**Notes:** Create a thoroughly researched campaign plan and presentation that can be added to a professional portfolio.**Description:** Apply skills in communications, public relations, and journalism to plan a strategic communications campaign. Examine principles and practice of marketing and communications applied to agricultural, science, or environmental issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**ALEC 826 Program Evaluation****Notes:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ALEC 855 Dynamics of Effective Leadership in Groups & Teams****Crosslisted with:** ALEC 455, CDEV 855**Prerequisites:** At least Junior standing is required for ALEC 455.**Description:** Explore 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**ALEC 866 Leadership and Diversity in Organizations and Communities****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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ALEC 891 Professional Exploration in Leadership Education and Leadership Studies****Prerequisites:** Admitted to ALEC graduate program or permission.**Description:** Plan and prepare successful professional trajectories post graduate degree in Leadership Education and Leadership Studies.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**Offered:** FALL

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ALEC 906 Theoretical Foundations of Distance Education****Notes:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ALEC 910 Leadership in Cross-cultural Systems****Notes:** 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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

AGRI 897 Master of Applied Science Project

Crosslisted with: AGRO 897, HORT 897, NRES 897, ASCI 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: PLPT 866; 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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: PLPT 866; PLPT 965, AGRO 965, HORT 965

AGRO 803 Scientific Writing and Communication

Crosslisted with: PLAS 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

Grading Option: Graded

AGRO 804 Soil Science Research Methods

Description: Introduce soil's role in the ecosystem and soil science research methods with emphasis on identifying, describing, and measuring soil properties in the field and then discussing how those properties and their variability may affect plant, animal, insect, and/or microbial communities.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 806 Plant Ecophysiology: Theory and Practice

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

AGRO 808 Microclimate: The Biological Environment

Crosslisted with: PLAS 408, GEOG 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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: BSEN 954, NRES 954

AGRO 809A Case studies in plant breeding: Breeding for Disease Resistance**Crosslisted with:** PLAS 409A, HORT 809A**Notes:** A previous class in genetics is highly recommended.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**AGRO 809B Case Studies in plant breeding: Transgenic strategies for disease resistance****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**AGRO 811 Crop Genetic Engineering****Crosslisted with:** PLAS 411**Notes:** A previous class in genetics is highly recommended.**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, and 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**AGRO 812 Crop and Weed Genetics****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AGRO 814 Turfgrass Disease Management****Crosslisted with:** HORT 814, PLPT 414, PLPT 814, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 919**AGRO 819 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35**AGRO 820 Bioinformatics Applications in Agriculture****Crosslisted with:** PLAS 420**Prerequisites:** PLAS 215 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. 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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 and 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**Grading Option:** Grade Pass/No Pass Option**AGRO 825 Cover Crops in Agroecosystems****Crosslisted with:** PLAS 425**Prerequisites:** PLAS 131 or PLAS 278 ; PLAS/SOIL 153 (or equivalent)**Description:** Explore the management, environmental, economic, and social considerations of cover crops across a diversity of agricultural production systems and regions. Grow cover crops, measure benefits and tradeoffs, and apply knowledge to make management and policy recommendations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**AGRO 826 Invasive Plants****Crosslisted with:** PLAS 426, HORT 826, NRES 426, NRES 826**Prerequisites:** PLAS/SOIL 153; PLAS 131**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**AGRO 827 Turfgrass Systems Management****Crosslisted with:** PLAS 427, HORT 827, TLMT 827**Prerequisites:** PLAS 227 and PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**AGRO 829 Plant Biotechnology Applications****Crosslisted with:** PLAS 429**Prerequisites:** Faculty Permission**Description:** Application of plant biotechnology to answer biological questions. Development of writing and thinking skills with a working knowledge of plant biology and biotechnology. Learning in a lab focused setting to solidify skills used in molecular biology, biochemistry, cell biology, and computational biology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Course and Laboratory Fee:** \$40**AGRO 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, ANTH 829A, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

AGRO 834 Plant Biochemistry

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 835 Agroecology

Crosslisted with: PLAS 435, NRES 435, NRES 835

Prerequisites: For PLAS/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

Grading Option: Grade Pass/No Pass Option

AGRO 836 Agroecosystems Analysis

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 837 Animal, Food and Industrial Uses of Grain

Crosslisted with: PLAS 437

Prerequisites: CHEM 105A and CHEM 105L or CHEM 109A and 109L, and one of the following: PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 838 Producing Grain for Animal, Food and Industrial Uses

Crosslisted with: PLAS 438

Prerequisites: CHEM 109A and 109L and one of the following: PLAS 204 or ASCI 250.

Notes: PLAS 215 and PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 839 Organic Farming and Food Systems

Crosslisted with: PLAS 439, HORT 839

Prerequisites: 12 credits of agricultural or biological science, economics, or natural resources

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

Grading Option: Grade Pass/No Pass Option

AGRO 840 Great Plains Ecosystem

Crosslisted with: PLAS 440, NRES 840, RNGE 440, NRES 440, GRAS 440

Prerequisites: Junior standing.

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 841 Perennial Plant Function, Growth, and Development

Crosslisted with: PLAS 441, HORT 841, RNGE 441, GRAS 441

Prerequisites: PLAS 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 842 Wildland Plants

Crosslisted with: PLAS 442, NRES 842, RNGE 442, NRES 442, GRAS 442

Prerequisites: Junior standing.

Notes: PLAS 131 or LIFE 121 and 121L 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, forbs, shrubs, exotic and wetland plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

AGRO 844 Ecosystem Monitoring and Assessment

Crosslisted with: PLAS 444, NRES 844, RNGE 444, NRES 444, GRAS 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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

AGRO 845 Livestock Management on Range and Pasture

Crosslisted with: PLAS 445, ASCI 451, ASCI 851, RNGE 445, GRAS 445

Prerequisites: ASCI 250 and PLAS 240 or PLAS 340

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$300

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

AGRO 850 Climate and Society

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

AGRO 855 Soil Chemistry and Mineralogy

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

Prerequisites: PLAS/SOIL 153 or GEOL 101; CHEM 109A/L and CHEM 110A/L; CHEM 221 or CHEM 221A & CHEM 221L or 251.

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. Forms and functions of organic matter in soil.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 858 Soil Physical Determinations

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

Prerequisites: SOIL/PLAS/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

Grading Option: Grade Pass/No Pass Option

AGRO 860 Soil Microbial Ecology

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

Prerequisites: Senior standing.

Notes: Recommend having a strong science background, including courses from the agronomic, environmental, microbiology, engineering or medicine disciplines.

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 861 Soil Physics

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

Prerequisites: PLAS/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

Grading Option: Grade Pass/No Pass Option

AGRO 862 Cannabis Growth, Production and Breeding Basics

Crosslisted with: PLAS 462, HORT 862

Prerequisites: PLAS 131 or LIFE 121; PLAS 215 or BIOS 206

Notes: PLAS 221 recommended

Description: History, breeding and production of cannabis for medicinal marijuana and hemp for fiber use when grown using a growth room, greenhouse, high tunnel and/or field. Clarification between scientific evidence and casual information.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Offered: FALL/SPR

AGRO 869 Bio-Atmospheric Instrumentation

Crosslisted with: GEOG 469, PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 872 Applied Soil Physics

Crosslisted with: PLAS 472, NRES 472, NRES 872, SOIL 472, WATS 472

Prerequisites: PLAS/SOIL 153; MATH 102 or MATH 104 or MATH 106.

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

AGRO 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 878 Plant Anatomy

Crosslisted with: BIOS 478, BIOS 878, PLAS 478, HORT 878

Prerequisites: 8 hrs biological sciences

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

Grading Option: Grade Pass/No Pass Option

AGRO 880 Modified Root Zones

Crosslisted with: PLAS 480, TLMT 880, HORT 880

Prerequisites: PLAS 153/SOIL 153

Notes: Recommend CHEM 105A/CHEM 105L or CHEM 109A/CHEM 109L, PLAS 131, PLAS 227, and PLAS 453 or PLAS 472

Description: Modified root zones 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

AGRO 884 Water Resources Seminar

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

AGRO 888 Entrepreneurship and Enterprise Development

Crosslisted with: PLAS 488, HORT 888, EAEP 488, ENTR 488, EAEP 888, ENTR 888, ABUS 488

Description: The process of starting your own enterprise. Competitive environment, risk management, finance for business startups, funding, and business plan writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

AGRO 889 Urbanization of Rural Landscapes

Crosslisted with: PLAS 489, CRPL 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

AGRO 896 Independent Study

Crosslisted with: PLAS 496, RNGE 496, SOIL 496

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$50

AGRO 897 Master of Applied Science Project

Crosslisted with: AGRI 897, HORT 897, NRES 897, ASCI 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

AGRO 902 Foundations of Ecological Resilience**Crosslisted with:** NRES 902**Prerequisites:** Graduate standing**Description:** Concept of resilience, especially ecological resilience, and resilience theory. Both theoretical and applied aspects of ecological resilience, and the development of resilience theory. Prominent issues in resilience science and applications to practical problems in natural resource management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Groups:** American Government&Public Pol Biology,Psychology,& Politics**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**Grading Option:** Grade Pass/No Pass Option**AGRO 919 Advanced Crop Genetics and Genomics****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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**AGRO 985 Soil Carbon and Nitrogen Dynamics****Crosslisted with:** NRES 985, SOIL 985**Notes:** Basic knowledge about soil biogeochemical characteristics and processes are required to take full advantage of the content delivered. Recommended courses: AGRO/SOIL 153 or AGRO 804, AGRO/SOIL 455/855, GEOL 417/817.**Description:** Understand carbon and nitrogen cycling in the soil ecosystem including feedbacks and implications for soil management, environment, and climate.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**AGRO 992 General Seminar****Crosslisted with:** HORT 992, NRES 992**Prerequisites:** Permission**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AGRO 999 Doctoral Dissertation****Crosslisted with:** HORT 999**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair.**Notes:** AGRO 999 is pass/no pass only.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Grading Option:** Pass No-Pass

Animal Science (ASCI)

ASCI 806 Animal Science Graduate Seminar**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**ASCI 810 Processed Meats****Crosslisted with:** ASCI 410**Prerequisites:** ASCI 210 or FDST 205.**Description:** Science and technology of modern meat processing.

Utilization of meat, non-meat ingredients, and processing techniques and their impact on processed meat characteristics. Laboratory provides hands-on application with the preparation, development, and evaluation of processed meats products.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ASCI 832 Genome Analysis****Crosslisted with:** ASCI 432**Prerequisites:** PLAS 215 and BIOC 401 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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$100**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**Grading Option:** Grade Pass/No Pass Option**ASCI 843 Physiology of Animal Cells and Tissues****Crosslisted with:** ASCI 443**Prerequisites:** ASCI 240 or ASCI 340 or BIOS 213**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**Grading Option:** Graded**Offered:** SPRING

ASCI 844 Domestic Animal Immunology**Crosslisted with:** ASCI 444**Prerequisites:** LIFE 120; LIFE 121; ASCI 240 or BIOS 213 or ASCI 340**Description:** Learn the fundamental knowledge of the animal immune system, and how to utilize immunology to improve animal health and production. Become familiar with common immunoassays, immunological diseases and immunotherapy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Groups:** Biology, Psychology, & Politics**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ASCI 851 Livestock Management on Range and Pasture****Crosslisted with:** PLAS 445, AGRO 845, ASCI 451, RNGE 445, GRAS 445**Prerequisites:** ASCI 250 and PLAS 240 or PLAS 340**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Course and Laboratory Fee:** \$300**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**ASCI 897 Master of Applied Science Project****Crosslisted with:** AGRI 897, 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Offered:** SPRING**ASCI 945 Complications of Maternal Obesity****Crosslisted with:** NUTR 945**Description:** Introduction to overnutrition and its complications during maternal obesity and metabolic syndrome.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**ASCI 949 Biochemistry of Nutrition****Crosslisted with:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

Anthropology (ANTH)

ANTH 804 Curation of Archaeological Collections**Description:** Provides an overview of theory, method, and practice related to archaeological collections and their management. Offers a hands-on approach to the curation of archaeological objects, records, and digital data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**Groups:** Additional Anthropology Course Archaeology

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**Grading Option:** Graded**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**ANTH 811 Visual Anthropology****Crosslisted with:** ANTH 411**Prerequisites:** 9 hours ANTH including ANTH 212; Junior standing**Notes:** Graded Only**Description:** Critically assess and understand basic theories of image usage, meaning making, and style. Covers evolution of photography, ethical usage and consent, ethnographic and documentary films, photo falsification.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ANTH 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, PLAS 429A, AGRO 829A, 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ANTH 835 Heritage Resource Protection and Management****Crosslisted with:** ANTH 435**Prerequisites:** ANTH 232**Description:** Explores 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**Grading Option:** Grade Pass/No Pass Option**ANTH 836 The Ancient Maya****Crosslisted with:** ANTH 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**ANTH 844 Human Osteology****Crosslisted with:** ANTH 444**Description:** Study of human osteology including histology, pathology, biomechanics and taphonomy.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35

ANTH 848 Human Growth and Development**Crosslisted with:** ANTH 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ANTH 855 Forensic Archaeology: Clandestine Burials, Mass Graves, and Human Rights****Crosslisted with:** ANTH 455**Notes:** Graded Only**Description:** Introduction to the archaeological methods and theories used to assist in the medico-legal investigation of forensics and criminal behavior as well as international humanitarian forensics and international crimes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**ANTH 856 Forensic Taphonomy: an Anthropological Approach****Crosslisted with:** ANTH 456**Prerequisites:** ANTH 243 or ANTH 462**Notes:** Graded only**Description:** Investigating and interpreting forensic casework in terms of large-scale mass disaster sites, including mass graves to surface scatter of human remains because of animal scavenging and geological processes (such as gravity, water, physical/chemical weathering).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Groups:** Biological Anthropology Archaeology Additional Anthropology Course**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**ANTH 862 Forensic Anthropology****Crosslisted with:** ANTH 462**Prerequisites:** ANTH 444/844 or parallel**Description:** Human skeletal identification and trauma analysis as a model for understanding the applied field of forensic anthropology.

Focuses on the wider scope of human skeletal biology dealing with problems of medico-legal significance, primarily in the determination of personal identity and cause of death from skeletonized human remains, as well as both interpretation and analysis of biological data toward this aim.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**ANTH 863 Museum Exhibit Design****Crosslisted with:** ANTH 463**Description:** Develop a museum exhibit to professional standards and participate in the process from conception through installation and ribbon-cutting. Study copy writing, object conservation, 3D model-building, graphic design, prototype development, exhibit construction techniques, and formative assessment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Groups: CAS Diversity in the US

ANTH 874 Development in Theory and Practice

Crosslisted with: ANTH 474, GLST 474

Prerequisites: Sophomore status

Description: Efforts by academic scholarship and experts in the field 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

Grading Option: Grade Pass/No Pass Option

ANTH 875 Experimental Archaeology

Crosslisted with: ANTH 475

Prerequisites: ANTH 232

Description: Explores the scientific manner in which archaeologists use controlled experiments to better understand life in the past.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

Experiential Learning: Project-Based Learning

ANTH 876 Human Rights, Environment, and Development

Crosslisted with: ANTH 476, GLST 476

Prerequisites: Sophomore status

Description: Various perspectives on the intersection of human rights, development, and the environment in a global perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ANTH 883 Material Culture Research Methods

Crosslisted with: TMFD 876

Prerequisites: TMFD 807 or TMFD 808

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$10

ANTH 884 Data Analytics in Anthropology

Crosslisted with: ANTH 484

Prerequisites: 6 hrs ANTH

Description: Collection, management, visualization, and analysis of quantitative anthropological data. Exploratory and confirmatory data analysis. Data analytics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$30

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ANTH 888 Contemporary Issues in Anthropology

Crosslisted with: ANTH 488

Prerequisites: 9 hrs of anthropology beyond ANTH 110.

Description: Recent issues and topics in the field of anthropology, including the subfields of cultural, biological, and archaeological anthropology.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ANTH 892 Special Topics in Anthropology

Crosslisted with: ANTH 492

Description: Topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ANTH 895 Internship in Anthropology

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

Grading Option: Grade Pass/No Pass Option

ANTH 896 Independent Study in Anthropology

Crosslisted with: ANTH 496

Prerequisites: Permission.

Description: Independent reading or research under direction by a faculty.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

ANTH 897 Advanced Fieldwork

Crosslisted with: ANTH 497

Prerequisites: Permission.

Notes: Only 3 hours may count toward the major.

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: 6

Grading Option: Grade Pass/No Pass Option

ANTH 898 Research

Crosslisted with: ANTH 498

Prerequisites: Permission.

Description: Independent research under direction of a faculty member.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ANTH 901 Proseminar in Research and Professional Development

Description: Exploration of effective writing, adapting proposals for different audiences, reviewing grants and manuscripts, and preparing professional presentations (talks, papers, posters).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

ANTH 915 Seminar in Cultural Anthropology

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: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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: 6

Grading Option: Grade Pass/No Pass Option

ANTH 945 Seminar in Bioanthropology

Description: Intensive study of theory and method in bioanthropology, with special attention to current research literature.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

AREN 803 Interdisciplinary Team Design Project I

Prerequisites: (Acoustics/Mechanical option) AREN 415 and AREN 430 or; (Electrical/Lighting option) AREN 425 and AREN 822 or; (Structural option) CIVE 444.

Notes: Not open to non-degree graduate students. 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AREN 913; AREN 915; AREN 916; AREN 917**AREN 814 Building Energy III: Advanced Building Energy System Modeling****Prerequisites:** AREN 310, AREN 412, or instructor 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AREN 425; AREN 823; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AREN 825 Daylighting****Prerequisites:** AREN 420 or 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AREN 842 Healthcare Design and Construction****Crosslisted with:** AREN 442, CNST 442, CNST 842**Prerequisites:** Senior or graduate standing**Description:** Introduction to the design and construction of healthcare facilities. Healthcare regulations and standards, infection control, interim life safety measures, code requirements, medical equipment selection and coordination, healthcare design and construction techniques, and best practices will be addressed. Provides guidance in preparation for the Certified Healthcare Constructor credential offered by the American Healthcare Association.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

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

Grading Option: Grade Pass/No Pass Option

AREN 860 Smart Building Sensors and Programming

Prerequisites: CSCE 155A

Description: Principles of modeling, interfacing, and signal conditioning of sample building sensors, and acquisition and analysis of data utilizing engineering programming language such as LabVIEW. Overview of current sensing technology and control in buildings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

AREN 862 Intelligent Sensors

Prerequisites: Instructor permission

Description: Study of the dynamics of Microelectromechanical system (MEMS) beam-structures. Modeling principles and data analysis from different types of MEMS will be explained along with deep theoretical and experimental investigation of nonlinear MEMS dynamics. Learn to conduct experiments using state-of-the-art MEMS characterization tools.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

AREN 894 SPECIAL TOPICS

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

AREN 918 FLUID DYNAMIC 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AREN 921 RSH: ILLUMINATN THRY****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**AREN 922 BEHVRL SCI LIGHT RSH****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**AREN 923 PSYCH OF LIGHTING****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**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**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**Offered:** FALL**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**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**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**Course and Laboratory Fee:** \$80**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**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**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**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**ARCH 544 Design Thesis Preparation Seminar****Crosslisted with:** ARCH 844**Prerequisites:** ARCH 489, ARCH 341**Notes:** Required preparation for the Design Thesis track (ARCH 613/ARCH 614)**Description:** Focused workshop for conceiving and articulating current architectural problems to frame the argumentation and reasoning towards a design thesis proposal.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Offered:** SPRING**Prerequisite for:** ARCH 613, ARCH 913**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**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**ARCH 561 Urbanism****Crosslisted with:** ARCH 461, LARC 461, ARCH 861**Prerequisites:** Admission to a professional program in the College of Architecture**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**Prerequisite for:** ARCH 562, LARC 462

ARCH 562 Urbanism and the Catalysts of Change**Crosslisted with:** LARC 462**Prerequisites:** Admission into the graduate portion of the professional program in Architecture or for undergraduate Landscape Architecture students; LARC 461**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**Offered:** FALL/SPR**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**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**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**ARCH 567 Planting Design****Crosslisted with:** ARCH 467, ARCH 867, LARC 467, PLAS 467**Description:** Processes, principles, and elements using plant materials as a key component of landscapes designed for human intent. Focus is on a systems approach, combining environmental attributes with functional needs to create aesthetic, functional, and sustainable landscapes for parks, commercial property, and residences using a combination of site visits and online resources.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Offered:** FALL**Course and Laboratory Fee:** \$25**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**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**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**Offered:** FALL**ARCH 592 Selected Topics in Architecture****Crosslisted with:** ARCH 492, ARCH 492H, ARCH 692, ARCH 892**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**ARCH 596 Problems in Architecture****Crosslisted with:** ARCH 496, ARCH 496H, ARCH 896**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**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**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**Offered:** SPRING**ARCH 613 Architectural Design Thesis I****Crosslisted with:** ARCH 913**Prerequisites:** ARCH 544, Design Thesis Preparation Seminar; M2 standing in the Master of Architecture Program; agreement with a faculty mentor**Description:** First semester of a year-long design-thesis project initiated in ARCH 544 and developed in conjunction with a faculty mentor. Initial visual and written studies addressing current issues relevant to the discipline of architecture to be completed in the following semester.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Prerequisite for:** ARCH 614, ARCH 914**ARCH 614 Architectural Design Thesis II****Crosslisted with:** ARCH 914**Prerequisites:** ARCH 613/913**Description:** Second semester of a year-long design thesis project begun in ARCH 613 culminating in a public presentation and written documentation.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**ARCH 617 Product Design****Crosslisted with:** ARCH 417, ARCH 817, IDES 417, IDES 817, LARC 417**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Generate a design from conception to a finished product that emphasizes the awareness of the human and the environment in the creation of product design solutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Offered:** FALL**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**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**ARCH 692 Selected Topics in Architecture****Crosslisted with:** ARCH 492, ARCH 492H, ARCH 592, ARCH 892**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**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**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

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**ARCH 817 Product Design****Crosslisted with:** ARCH 417, ARCH 617, IDES 417, IDES 817, LARC 417**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Generate a design from conception to a finished product that emphasizes the awareness of the human and the environment in the creation of product design solutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$80**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

ARCH 844 Design Thesis Preparation Seminar**Crosslisted with:** ARCH 544**Prerequisites:** ARCH 489, ARCH 341**Notes:** Required preparation for the Design Thesis track (ARCH 613/ARCH 614)**Description:** Focused workshop for conceiving and articulating current architectural problems to frame the argumentation and reasoning towards a design thesis proposal.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** SPRING**Prerequisite for:** ARCH 613, ARCH 913**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**Grading Option:** Graded**ARCH 861 Urbanism****Crosslisted with:** ARCH 461, LARC 461, ARCH 561**Prerequisites:** Admission to a professional program in the College of Architecture**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**Grading Option:** Graded**Prerequisite for:** ARCH 562, LARC 462**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**ARCH 867 Planting Design****Crosslisted with:** ARCH 467, ARCH 567, LARC 467, PLAS 467**Description:** Processes, principles, and elements using plant materials as a key component of landscapes designed for human intent. Focus is on a systems approach, combining environmental attributes with functional needs to create aesthetic, functional, and sustainable landscapes for parks, commercial property, and residences using a combination of site visits and online resources.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Course and Laboratory Fee:** \$25**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Offered:** FALL**ARCH 892 Selected Topics in Architecture****Crosslisted with:** ARCH 492, ARCH 492H, ARCH 592, ARCH 692**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**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**ARCH 896 Problems in Architecture****Crosslisted with:** ARCH 496, ARCH 496H, ARCH 596**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**Offered:** SPRING

ARCH 913 Architectural Design Thesis I**Crosslisted with:** ARCH 613**Prerequisites:** ARCH 544, Design Thesis Preparation Seminar; M2 standing in the Master of Architecture Program; agreement with a faculty mentor**Description:** First semester of a year-long design-thesis project initiated in ARCH 544 and developed in conjunction with a faculty mentor. Initial visual and written studies addressing current issues relevant to the discipline of architecture to be completed in the following semester.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Grading Option:** Graded**Prerequisite for:** ARCH 614, ARCH 914**ARCH 914 Architectural Design Thesis II****Crosslisted with:** ARCH 614**Prerequisites:** ARCH 613/913**Description:** Second semester of a year-long design thesis project begun in ARCH 613 culminating in a public presentation and written documentation.**Credit Hours:** 5**Max credits per semester:** 5**Max credits per degree:** 5**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 846 Art & Design Since 1945****Crosslisted with:** AHIS 446**Prerequisites:** 9cr of AHIS courses**Description:** Art and design 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AHIS 448, AHIS 848**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 851 19th-Century American Art****Crosslisted with:** AHIS 451**Prerequisites:** 12 hrs art history including AHIS 251 or 341.**Description:** 19th Century American art and material culture.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AHIS 472, AHIS 872**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 888 The Global 1960s****Crosslisted with:** AHIS 488**Prerequisites:** Permission**Description:** Covers the changes to art and design that took place in the 1960s. Includes cultural shifts such as decolonization, rising consumerism, changing approaches to gender and sexuality, and emergent technologies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 916 Seminar in Medieval Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 921 Seminar in Italian Renaissance Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**AHIS 926 Seminar in Northern Renaissance Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**AHIS 931 Seminar in Baroque Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**AHIS 946 Seminar in Modern Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 951 Seminar in American Art****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

AHIS 956 Seminar in Latin American Art**Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**AHIS 980 Seminar in Art Historical Problems****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**AHIS 988 Introduction to the Interdisciplinary Study of the Middle Ages****Crosslisted with:** ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Art Theory and Practice (ARTP)

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**Grading Option:** Graded**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Course and Laboratory Fee:** \$40**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**Grading Option:** Graded

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**Grading Option:** Graded**Prerequisite for:** CERM 931; CERM 932**Course and Laboratory Fee:** \$260**CERM 832 Ceramics II****Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Graded**Prerequisite for:** CERM 931; CERM 932**Course and Laboratory Fee:** \$260**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**Grading Option:** Graded**Course and Laboratory Fee:** \$135

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**Grading Option:** Graded**Course and Laboratory Fee:** \$35**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$135**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**Grading Option:** Graded**Course and Laboratory Fee:** \$260**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**Grading Option:** Graded**Course and Laboratory Fee:** \$260**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**Grading Option:** Graded**Course and Laboratory Fee:** \$260**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**Grading Option:** Graded**Course and Laboratory Fee:** \$260**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**Grading Option:** Graded**Course and Laboratory Fee:** \$260

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$40**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: GRPH 921; GRPH 922

Course and Laboratory Fee: \$30

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

Grading Option: Graded

Prerequisite for: GRPH 921; GRPH 922

Course and Laboratory Fee: \$30

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

Grading Option: Graded

Prerequisite for: GRPH 925

Course and Laboratory Fee: \$80

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

Grading Option: Graded

Course and Laboratory Fee: \$80

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Course and Laboratory Fee: \$20

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

Grading Option: Graded

Prerequisite for: PANT 951; PANT 952

Course and Laboratory Fee: \$45

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

Grading Option: Graded

Prerequisite for: PANT 951; PANT 952

Course and Laboratory Fee: \$45

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

Grading Option: Graded

Course and Laboratory Fee: \$40

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

Grading Option: Graded

Course and Laboratory Fee: \$45

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

Grading Option: Graded

Course and Laboratory Fee: \$45

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

Grading Option: Graded

Prerequisite for: PHOT 862; PHOT 899; PHOT 961

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Prerequisite for: PHOT 899; PHOT 961

Groups: Additional Anthropology Course

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Prerequisite for: PHOT 899; PHOT 962

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Prerequisite for: PHOT 899

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Course and Laboratory Fee: \$60

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

Grading Option: Graded

Prerequisite for: PRNT 941; PRNT 942

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Prerequisite for: PRNT 941; PRNT 942

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Course and Laboratory Fee: \$135

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

Grading Option: Graded

Course and Laboratory Fee: \$135

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

Grading Option: Graded

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Prerequisite for: SCLP 911; SCLP 912

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Prerequisite for: SCLP 911; SCLP 912

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Course and Laboratory Fee: \$160

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

Grading Option: Graded

Course and Laboratory Fee: \$160

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**Grading Option:** Graded**Course and Laboratory Fee:** \$160

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**Grading Option:** Graded**Course and Laboratory Fee:** \$40**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**Grading Option:** Graded

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**Grading Option:** Graded**Prerequisite for:** WATC 957; WATC 958**Course and Laboratory Fee:** \$10**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**Grading Option:** Graded**Prerequisite for:** WATC 957; WATC 958**Course and Laboratory Fee:** \$10**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

ASTR 892 Special Topics in Astronomy**Crosslisted with:** ASTR 492**Prerequisites:** ASTR 204 and permission.**Description:** Topic varies.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option

Biological Chemistry (BIOC)

BIOC 801 Elements of Biochemistry**Crosslisted with:** BIOC 401**Prerequisites:** CHEM 255 (preferred) or CHEM 251; BIOS 101 and BIOS 101L or LIFE 120 and LIFE 120L**Notes:** Will not count towards a biochemistry major.**Description:** Structure and function of proteins, carbohydrates, lipids and nucleic acids; enzymes; principal metabolic pathways; and biochemical expression of genetic information.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** FDST 867; NUTR 450; NUTR 455; VBMS 410**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 919**BIOC 831 Biochemistry I: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** 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; BIOC 440; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; PLAS 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; VBMS 410; VBMS 805**BIOC 832 Biochemistry II: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ASCI 949, BIOC 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 998; 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898**Course and Laboratory Fee:** \$50

BIOC 834 Plant Biochemistry

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: VBMS 919

Course and Laboratory Fee: \$70

BIOC 839 Dynamics of Biochemical and Biological Networks

Crosslisted with: BIOC 439, BIOS 439, BIOS 839

Prerequisites: BIOS 206 or PLAS 215; BIOC 401 or BIOC 431

Notes: Letter grade only.

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

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

BIOC 848 Redox Biochemistry

Crosslisted with: CHEM 848

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**BIOC 949 Biochemistry of Nutrition****Crosslisted with:** ASCI 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**BIOC 992K Seminar in Biological Chemistry****Crosslisted with:** CHEM 992K**Description:** Presentations of current and original Biochemistry research.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**BIOS 808 Functional Histology****Crosslisted with:** BIOS 408, VBMS 408, VBMS 808**Prerequisites:** BIOS 101 and 101L or LIFE 120 and 120L; 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 963, HORT 963, PLPT 963; 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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**BIOS 824 Biogeochemical Cycles****Crosslisted with:** BIOS 424, GEOL 424, GEOL 824**Prerequisites:** CHEM 109A and 109L or CHEM 113A and 113L; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**BIOS 831 Biochemistry I: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** 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; BIOC 440; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; PLAS 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; VBMS 410; VBMS 805**BIOS 832 Biochemistry II: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ASCI 949, BIOC 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 998; 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898**Course and Laboratory Fee:** \$50**BIOS 834 Plant Biochemistry****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**BIOS 835 Evolutionary Medicine****Crosslisted with:** BIOS 435**Prerequisites:** BIOS 207 and senior standing**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**BIOS 836 Macroecology****Crosslisted with:** BIOS 436**Prerequisites:** BIOS 207**Description:** Species-area relationships, latitudinal gradients in species richness, abundance diversity relationships, ecological scaling relationships with body size, community assembly, evolutionary dynamics, climate change, and human impacts on the ecology of the Anthropocene.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 919**Course and Laboratory Fee:** \$70**BIOS 839 Dynamics of Biochemical and Biological Networks****Crosslisted with:** BIOC 439, BIOC 839, BIOS 439**Prerequisites:** BIOS 206 or PLAS 215; BIOC 401 or BIOC 431**Notes:** Letter grade only.**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**Grading Option:** Graded**Offered:** SPRING**Prerequisite for:** ASCI 949, BIOC 949, NUTR 949; BIOC 932, BIOS 932, CHEM 932; BIOC 933, BIOS 933, CHEM 933; BIOC 998**BIOS 840 Microbial Physiology****Crosslisted with:** BIOS 440, VBMS 840, MBIO 440, VBMS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 805; VBMS 949**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**BIOS 843 Immunology****Crosslisted with:** BIOS 443, VBMS 843, MBIO 443, VBMS 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 852; VBMS 908; VBMS 910; VBMS 948; VBMS 949**BIOS 844 Earth and Environmental Microbiology****Crosslisted with:** BIOS 444, GEOL 444, GEOL 844**Prerequisites:** 3 hours of BIOS or 3 hours of LIFE; 3 hours of CHEM**Description:** An introduction into the role that microorganisms play and have played in natural and man-made environments. Topics covered include microbial diversity and physiology in soil, sediment, and water; microbes in Earth history; biogeochemical cycling; mineral formation and dissolution; biodegradation and bioremediation; biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**BIOS 845 Food Microbiology****Crosslisted with:** BIOS 445, FDST 405, FDST 805**Prerequisites:** BIOS 312**Notes:** BIOC 401 or BIOC 431 recommended**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** BIOS 446, BIOS 846, FDST 406, FDST 806; FDST 424, FDST 824; FDST 425, FDST 825; FDST 455, FDST 855, MBIO 455; FDST 455L, FDST 855L, MBIO 455L; FDST 460, FDST 860; FDST 867; 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$10**BIOS 851 Invertebrate Paleobiology****Crosslisted with:** GEOL 451, BIOS 451, GEOL 851**Prerequisites:** At least one of: GEOL 103, GEOL 105, LIFE 121**Description:** Overview of the key traits, relationships and evolutionary dynamics of invertebrate animals over Earth's history, particularly over the Phanerozoic (i.e., the last 540 million years). Emphasis on the use of invertebrate fossil record to test ideas about long term evolutionary patterns as well as learning the histories and basic anatomies of major invertebrate taxa.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**BIOS 857 Ecosystem Ecology****Crosslisted with:** BIOS 457, GEOL 457, GEOL 857**Prerequisites:** BIOS 207 and CHEM 110A and 110L 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BSEN 954, NRES 954

BIOS 859 Limnology**Crosslisted with:** BIOS 459, NRES 459, NRES 859, WATS 459**Prerequisites:** BIOS 207 or NRES 220; CHEM 106A & CHEM 106L or CHEM 110A & CHEM 110L**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$25**BIOS 860 Soil Microbial Ecology****Crosslisted with:** PLAS 460, BIOS 460, NRES 460, SOIL 460, AGRO 860, NRES 860**Prerequisites:** Senior standing.**Notes:** Recommend having a strong science background, including courses from the agronomic, environmental, microbiology, engineering or medicine disciplines.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**BIOS 865 Behavioral Neuroscience****Crosslisted with:** BIOS 465, PSYC 465, PSYC 865**Prerequisites:** PSYC 273**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**BIOS 874 Herpetology****Crosslisted with:** BIOS 474, NRES 474, NRES 874**Prerequisites:** BIOS/NRES 386 and permission.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$90**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**BIOS 878 Plant Anatomy****Crosslisted with:** BIOS 478, PLAS 478, AGRO 878, HORT 878**Prerequisites:** 8 hrs biological sciences**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: NRES 464, NRES 864

Course and Laboratory Fee: \$20

BIOS 891 Special Topics in Biological Sciences

Crosslisted with: BIOS 491

Prerequisites: BIOS 206 or BIOS 207

Description: Topics vary.

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 9

Grading Option: Grade Pass/No Pass Option

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: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

BIOS 915N Population Ecology

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

BIOS 915P Graduate Seminar - Parasitology

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**BIOS 952 Likelihood & Bayesian Ecology****Notes:** NRES/STAT 803 recommended.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Biological Systems Engineering (BSEN)

BSEN 812 Rehabilitation Engineering

Crosslisted with: BSEN 412

Description: Application of engineering methods to the development of assistive technology for people with injuries and disabilities. Characterization of the physical and mental capabilities of people with impairment, universal design, assistive technologies associated with seating, transportation, communication, and recreation. Integration of engineering design principles in a rehabilitation design project.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

BSEN 816 Introduction to Biomaterials

Crosslisted with: BSEN 416

Prerequisites: BSEN/AGEN 225 or MECH 325; BIOC 401 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**BSEN 844 Biomass and Bioenergy Engineering****Crosslisted with:** BSEN 444**Prerequisites:** Senior/graduate standing in engineering; BIOC 401 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**Grading Option:** Grade Pass/No Pass Option**BSEN 845 Bioprocess Engineering****Crosslisted with:** BSEN 445**Prerequisites:** BIOC 401 or BIOC 431; BSEN 303, BSEN 344**Description:** Engineering topics related to processing of biological materials into valuable products. Enzyme kinetics, microbial kinetics, application of enzymes in industrial processes, bioreactor design, equipment scale-up, gas transfer in reactors and bioseparations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGEN 854, MSYM 854; AGEN 953**BSEN 855 Nonpoint Source Pollution Control Engineering****Crosslisted with:** BSEN 455, CIVE 455, CIVE 855**Prerequisites:** BSEN 321/CIVE 321 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**BSEN 860 Instrumentation and Controls****Crosslisted with:** AGEN 460, AGEN 860, BSEN 460**Prerequisites:** ECEN 211 or ECEN 215 or AGEN/BSEN 260**Description:** Analysis and design of instrumentation and controls for agricultural, biological, and biomedical applications. Theory of basic sensors and transducers, analog and digital electrical control circuits, and the interfacing of computers with instruments and controls. LabVIEW Programming. Emphasis on signal analysis and interpretation for improving system performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

BSEN 868 Wetlands

Crosslisted with: BIOS 458, NRES 468, NRES 868, WATS 468, BSEN 468

Prerequisites: CHEM 109A and 109L and CHEM 110A and 110L, or CHEM 105A and 105L and CHEM 106A and 106L; Junior or Senior Standing.

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$40

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

BSEN 910 Delivery of Nucleic Acids

Prerequisites: Graduate Standing

Description: Engineering methods and principles to design delivery systems that can transfer nucleic acids to mammalian cells, including viral, non-viral and physical techniques, and review of applications including vaccines and gene therapies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

BSEN 942 Antimicrobial Resistance from a One Health Perspective

Prerequisites: Graduate Standing

Description: Covers the fundamentals of antimicrobial resistant development, transmission, and risks to humans, animals and the environment delivered by experts in One Health fields (interconnection between people, animals, and their shared environment). Exposed to a variety of perspectives on the highly complex problem of AMR and the spectrum of the challenges and the opportunities of multidisciplinary efforts to address it. Expected to work together with their peers across the country to review and develop research-based resources and methods for communicating scientific information about AMR to non-academic audiences.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

Broadcasting (BRDC)

BRDC 833 Digital Motion Graphics

Crosslisted with: BRDC 433

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

BRDC 854 Broadcast Management

Crosslisted with: BRDC 454

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

BRDC 873 Broadcast Documentary

Crosslisted with: BRDC 473

Prerequisites: JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

CHME 809 Process Intensification and Sustainability

Crosslisted with: CHME 409

Prerequisites: Senior Standing

Description: Process intensification focuses on considerable improvements in tens to hundred percent in manufacturing by modification of existing operations or new designs. Optimization of manufacturing processes is at the core of PI

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CHME 830 Chemical Engineering Laboratory II****Crosslisted with:** CHME 430**Prerequisites:** CHME 330; CHME 442 or parallel; CHME 462 or parallel.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**Experiential Learning:** Leadership, Project-Based Learning**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGEN 325, BSEN 325; AGEN 344, BSEN 344; CHME 330; CHME 333, CHME 833; CHME 420; CHME 835; CIVE 420; ENVE 410**CHME 833 Transport Operations II****Crosslisted with:** CHME 333**Prerequisites:** CHME 312, CHME 332**Description:** Continuation of CHME 332/832.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Leadership, Project-Based Learning**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**Grading Option:** Grade Pass/No Pass Option**CHME 860 Automatic Process Control Laboratory****Crosslisted with:** CHME 460**Prerequisites:** Parallel: CHME 462.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHME 965**CHME 871 Stem Cell Engineering and Regenerative Medicine****Crosslisted with:** CHME 371**Prerequisites:** CHEM 109A and 109L or CHEM 113A and 113L.**Description:** Introduction to stem cells and regenerative medicine with emphasis on stem cells and their application in the treatment of diseases and translational lab-to-clinic hurdles in stem cell therapy**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**CHME 882 Polymers****Crosslisted with:** CHME 482**Prerequisites:** CHEM 262, 264 or 264A, and MATH 221**Description:** Introduction to polymer synthesis, structure, polymer physics, thermodynamics, kinetics, polymer characterization techniques, polymer properties and applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CHME 883 Chemical Processes in Semiconductor Manufacturing****Crosslisted with:** CHME 483**Prerequisites:** A grade of C or better in ECEN 211 and MATH 208**Description:** Introduction to the basic chemical processes used in chip manufacturing, with emphasis on: thin-film metal and dielectric deposition, etching, ion implantation, diffusion, lithography, and planarization. Discuss material synthesis and processing and the principle physical/chemical governing phenomena.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Chemistry (CHEM)

CHEM 821 Analytical Chemistry**Crosslisted with:** CHEM 421**Prerequisites:** CHEM 221 or CHEM 221A & CHEM 221L and MATH 106; 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Prerequisite for:** CHEM 423, CHEM 823; CHEM 824; CHEM 825A; CHEM 825B; CHEM 825D; 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$65**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHEM 825K**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**Grading Option:** Grade Pass/No Pass Option**CHEM 825D Mass Spectrometry****Prerequisites:** CHEM 821 or 824 or permission**Description:** Comprehensive study of the fundamentals and applications of mass spectrometry including ionization methods, mass analyzers, hybrid instruments, and ion dissociation methods. Each topic will include illustrative examples involving a variety of analytes and application areas.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**CHEM 825E Data Handling and Statistics****Prerequisites:** CHEM 824**Description:** Application of statistical, graphical and numerical methods for the treatment of analytical chemical data.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**CHEM 825G Chromatographic Separations****Prerequisites:** CHEM 821 or 824**Description:** Survey of principles and applications of modern chromatographic analysis including the general chemical and physical principles of chemical separations, gas or liquid chromatography, and electrophoretic methods. The applications and instrumentation in these methods are discussed, along with advanced separation techniques and hybrid methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING

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**Grading Option:** Grade Pass/No Pass Option**CHEM 825K Introduction to Nuclear Magnetic Resonance****Prerequisites:** CHEM 825A**Description:** Introduction to the theory and techniques of nuclear magnetic resonance (NMR) spectroscopy with a particular application to the structure determination of organic compounds. Basic theory of NMR that includes chemical shifts, coupling constants and relaxation. Topics include the application and analysis of two-dimensional NMR spectra to determine chemical structures, the basic design and implementation of an NMR experiment or pulse sequence, and NMR instrumentations, RF pulses, experimental and processing parameters.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** CHEM 925**CHEM 831 Biochemistry I: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** 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; BIOC 440; FDST 470, FDST 870; NUTR 450; NUTR 455; NUTR 820; NUTR 821; PLAS 434, BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834; VBMS 410; VBMS 805**CHEM 832 Biochemistry II: 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 PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ASCI 949, BIOC 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 998; 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** BIOC 437, BIOC 837, BIOS 437, BIOS 837; BIOC 898**Course and Laboratory Fee:** \$50**CHEM 834 Plant Biochemistry****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**CHEM 835 Chemical Biology****Crosslisted with:** CHEM 435**Prerequisites:** CHEM 252 or 262, and CHEM 221A/CHEM 221L**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Prerequisite for:** BIOC 433, BIOC 833, BIOS 433, BIOS 833, CHEM 433, CHEM 833; CHEM 437, CHEM 837

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**Grading Option:** Grade Pass/No Pass Option**CHEM 837 Chemical Biology Laboratory****Crosslisted with:** CHEM 437**Prerequisites:** CHEM 435/835 or parallel**Description:** Introduction to techniques of chemical biology including the study of biological macromolecules and their interaction with small molecule ligands and effectors. Explore modern methods for macromolecular isolation, characterization, and for kinetic analysis and modeling.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** FALL**Course and Laboratory Fee:** \$65**CHEM 838 Computational Chemical Biology****Crosslisted with:** CHEM 438**Description:** Introduction to computational chemistry applications including molecular dynamics simulations, density functional theory optimizations, and computational docking of small molecules to protein targets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**CHEM 841 Inorganic Chemistry****Crosslisted with:** CHEM 441**Prerequisites:** CHEM 221 or CHEM 221A & CHEM 221L 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHEM 845**Course and Laboratory Fee:** \$65**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHEM 943; CHEM 945; CHEM 991B**CHEM 848 Redox Biochemistry****Crosslisted with:** BIOC 848**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**Grading Option:** Grade Pass/No Pass Option**CHEM 853 Biosynthetic Pathways****Crosslisted with:** CHEM 453**Prerequisites:** CHEM 251 or CHEM 261**Description:** Biosynthetic pathways for bioactive natural products and pathway engineering with an emphasis on those that are medicinally significant, including the biosynthesis of fatty acids, polyketides, phenylpropanoids, terpenoids, steroids, alkaloids, non-ribosomal peptides, and carbohydrates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$60**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CHEM 871 Physical Chemistry****Crosslisted with:** CHEM 471**Prerequisites:** CHEM 221 or CHEM 221A & CHEM 221L; 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BIOC 486, BIOC 886, BIOS 486, BIOS 886, CHEM 486, CHEM 886**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

CHEM 881 Physical Chemistry I**Crosslisted with:** CHEM 481**Prerequisites:** CHEM 221 or CHEM 221A & CHEM 221L 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHEM 484, CHEM 884; CHEM 484A, CHEM 884A; CHEM 845; CHEM 987A; CHEM 987B; CHEM 991J; CHME 925; MATL 962; MATL 972**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$65**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$65**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

CHEM 925 NMR Spectroscopy and Macromolecular Structures

Prerequisites: CHEM 825K

Description: Advanced theory and techniques of nuclear magnetic resonance (NMR) spectroscopy and its application to the structural and dynamic analysis of macromolecules and macromolecule-ligand complexes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

CHEM 936 Molecular Biology Methods

Prerequisites: CHEM 431/831, or CHEM 835

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CHEM 992A Graduate Seminar in Analytical/Bioanalytical Chemistry****Prerequisites:** Graduate student enrollment in Chemistry**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CHEM 992E Graduate Seminar in Organic Chemistry/Chemical Biology****Prerequisites:** Graduate student enrollment in Chemistry**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CHEM 992K Seminar in Biological Chemistry****Crosslisted with:** BIOC 992K**Description:** Presentations of current and original Biochemistry research.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Child, Youth and Family Studies (CYAF)

CYAF 800 Coaching Methods I: Effective Strategies for Supporting Professional Learning**Prerequisites:** Permission only**Description:** Introductory exploration of the adult learning literature to understand how coaching can support adult professional learning. Identification of key research-based practices to use when coaching in early childhood. Discussion on how to use these key practices in a variety of early childhood settings with a variety of early childhood professionals. Introductory understanding of how to use and evaluate their coaching.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 800A Coaching Practicum I****Prerequisites:** Permission only**Description:** Opportunity to enact and receive feedback on using knowledge gained in the CYAF 800. Work on developing coaching key practices in real-world contexts and gain a preliminary understanding of how to implement and reflect on coaching.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 801 Coaching Methods II: Supporting Professionals' Use of Data to Inform Practice through Effective Coac****Prerequisites:** Permission only**Description:** Build upon students' developing knowledge, skills, and dispositions to deepen and advance coaching practices developed in CYAF 800: Coaching Methods I and CYAF 800L Coaching Practicum I. Further students' abilities to support teachers in collecting data and using data to inform instruction. Effective coaching discussions will bring together a variety of key coaching strategies, as well as discussion on how to use these key practices in a variety of early childhood settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

CYAF 801A Coaching Practicum II**Prerequisites:** Permission only**Description:** Opportunity to build upon previously developed coaching skills in order to enhance their enactment of coaching strategies while also building self-reflection skills and receiving feedback on practice. Enhancement of understanding of how to implement, reflect on, and refine their own coaching, and build on new knowledge developed in CYAF 801: Coaching Methods II.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 802 Mathematical Content Knowledge for Teachers of Young Children****Crosslisted with:** CYAF 402**Notes:** Parallel with TEAC 416D**Description:** Develop key mathematical content knowledge necessary for early childhood professionals through explorations of the five content strands in mathematics: number and operations, algebraic reasoning, measurement, geometry, data analysis probability. Develop logical reasoning and skills. Become effective communicators of mathematical content.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 804 Teaching Clothing in Middle & Secondary Schools****Crosslisted with:** CYAF 404**Description:** Preparation to teach basic construction skills, understand technology, fabrics, and the uses and applications of textiles within the home, business and industry. Curriculum within the clothing and textiles classes in middle and high school FCS classes should incorporate intellectual and critical thinking skills along with the traditional technical subject matter taught in the past.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Experiential Learning:** Other**CYAF 804A FCSE: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 804B FCSE: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 805 FCSE: 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**Grading Option:** Graded**CYAF 806 FCSE: 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**Grading Option:** Graded**CYAF 807 Supervisory Leadership****Crosslisted with:** ALEC 407, ALEC 807**Prerequisites:** ALEC 202 or ALEC 302; Junior standing**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**Grading Option:** Grade Pass/No Pass Option**CYAF 808 FCSE: 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**Grading Option:** Grade Pass/No Pass Option

CYAF 809 FCSE: 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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**CYAF 812 FCSE: 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**Grading Option:** Graded**CYAF 813 Global Case Studies in Refugee Health & Wellbeing****Crosslisted with:** CYAF 413**Description:** Explore the dynamics of forced migration across the continuum, with particular emphasis on the effects of migration on the family unit.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Experiential Learning:** Other**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**CYAF 815 Family and Violence in the Global Context****Crosslisted with:** CYAF 415**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**CYAF 816 Educational Programming****Crosslisted with:** CYAF 416**Prerequisites:** Junior standing**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

CYAF 818 FCSE: 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

Grading Option: Grade Pass/No Pass Option

CYAF 819 FCSE: Advising FCCLA

Description: Designed to prepare advisors of Family, Career, and Community Leaders of America chapters, prepare Family and Consumer Sciences teachers to build leadership in students, and raise awareness of FCCLA resources and activities available for FCS teachers to implement in their classroom.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

CYAF 820 FCSE: Profession in Focus

Description: Enhance career through a wide variety of professional development experiences by utilizing local, state, national and international professional associations. Recognize the importance of building a professional network in Family and Consumer Sciences, Home Economics, government, business, and non-profit organizations. Emphasis is given to leadership and professional development, while drawing upon professional and personal experiences at the state, national and international level. Identification of your leadership style and analyze leadership potential for building your own network and memorable experiences at the national and international level.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

CYAF 821 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 822 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 823 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 824 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 825 FCSE: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 826 FFPLN: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 827 FAM: 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**Grading Option:** Graded**CYAF 828 FFPLN: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 830 FCSE: Family Issues and Public Policy****Description:** Designed to help Family and Consumer Sciences Educators address the impact of private and public family and related community issues and how to take the appropriate social action in a democratic culture. Attention will be given to the role of the educator in helping students critically examining these issues through FCS programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 831 ECFP: History, Development, and Equity in Shaping Early Childhood Policy****Description:** Provides an overview of the research on young children (birth to age five), demographics of this population, critical domains of development, significance of early brain development, and issues of inequality and disproportionality that deeply shape child outcomes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Prerequisite for:** CYAF 832; CYAF 906; CYAF 907**CYAF 832 ECFP: Using a Policy Framework to Examine Early Childhood Services and Issues****Prerequisites:** CYAF 831 or Permission.**Description:** Advances general early childhood education and care (ECEC) policy knowledge and addresses contextual and historical variables that have affected its evolution in the United States. Provides an overview of the practices, policies, and issues framing the design and delivery of contemporary ECEC. Central to such formulations, the role of parents and families is addressed as a critical contouring variable. Addresses three units: (i) understanding early childhood education and care practice and policy in the United States; (ii) identifying critical policy challenges; and (iii) addressing critical policy challenges.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**CYAF 833 FAM: Nonprofits in a Global Society****Description:** An introduction to the role(s) of nonprofit and nongovernmental organizations (NGOs) working with diverse families in U.S. and global settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SUMMER**CYAF 835 FFPLN: 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**Grading Option:** Grade Pass/No Pass Option

CYAF 836 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 838 FAM: 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

Grading Option: Graded

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

Grading Option: Graded

CYAF 840 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

CYAF 841 FFPLN: 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

CYAF 846 Addictions and Families

Crosslisted with: CYAF 446

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

Grading Option: Grade Pass/No Pass Option

CYAF 848A FFPLN: 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

Grading Option: Graded

Prerequisite for: CYAF 848B

CYAF 848B FFPLN: 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

Grading Option: Graded

CYAF 849 FAM: 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**Grading Option:** Graded**CYAF 850 FCSE: 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CYAF 452, CYAF 852**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**Grading Option:** Grade Pass/No Pass Option**CYAF 853 FAM: 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**Grading Option:** Graded**CYAF 854 FAM: 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**Grading Option:** Graded**CYAF 855 FCSE: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 856 FAM: 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**Grading Option:** Graded

CYAF 857 FAM: 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**Grading Option:** Graded**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**Grading Option:** Graded**CYAF 859 FAM: 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**Grading Option:** Graded**CYAF 860 YD: Adolescent Health and Sexuality****Prerequisites:** Admission to CYAF graduate program.**Description:** Explores adolescent health and sexuality. Study the personal, social, ecological, economic, political, and cultural determinants and factors that influence adolescent health and sexuality from a population, community health perspective. Implications for professionals working with adolescent health and sexuality will be explored and highlighted.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**CYAF 861 YD: Foundational Skills in Positive Youth Development****Prerequisites:** Admission to CYAF graduate program or CYAF graduate certificate program**Notes:** Designed to provide a foundation of basic knowledge and skills needed to be successful in the Great Plains-IDEA Youth Development programs**Description:** Provides an introduction to the field of positive youth development (PYD) including an overview of key theory and practice principles that enhance the profession of youth work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CYAF 862 YD: Youth-Adult Relationships****Prerequisites:** Admission to CYAF graduate program**Description:** Examines the role of caring adults in promoting the positive development of youth. Explores the spectrum of adult attitudes toward youth as well as activities that invite youth to engage and develop agency. Includes examination of the research and practice of mentorship, youth-adult partnerships, and youth leadership**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**CYAF 863 YD: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 864 YD: Positive Youth Development in Community Settings****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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CYAF 982; CYAF 983

CYAF 867 FCSE: Critical Science

Description: Focus on the special topic of critical science, both as a theoretical framework and as a practical/rational process for addressing significant and complex problems facing families. Exploration of critical science through reading and discussing published works of scholars, viewing short narrated PowerPoint lectures, and applying principles of critical science to FCS professional practice and research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

CYAF 868 YD: 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

Grading Option: Grade Pass/No Pass Option

CYAF 869 FAM/YD: 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

Grading Option: Grade Pass/No Pass Option

CYAF 870 Systemic Treatment of Diverse Couples and Families

Prerequisites: Permission

Description: Develop cultural competency skills for Marriage and Family Therapy treatment. Building the skills needed to treat individuals, couples and families on the awareness of ones own culture, the knowledge of other cultures. Understanding past and current contexts for marginalized families and the impact that has on their experience of seeking mental health treatment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

CYAF 871 Human Sexuality and Society

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

Prerequisites: Junior or Senior 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

Grading Option: Grade Pass/No Pass Option

CYAF 872 YD: 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

Grading Option: Grade Pass/No Pass Option

CYAF 873 FAM/YD: 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: SPED 362

Course and Laboratory Fee: \$25

Experiential Learning: Other

CYAF 875 YD: 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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**CYAF 877 YD: Design and Evaluation of Youth Programs****Prerequisites:** Admission to CYAF graduate program.**Description:** Discusses the principles and methods of program design, implementation, and evaluation of youth programs. Focuses on hands-on tools of conducting evidence-based planning and evaluating the performance and delivery process of a program. Develop knowledge through participating in a community-based project involving the practical application of program design and evaluation methods. Become prepared for research supported planning and evaluation of programs that aim at positive youth development.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**CYAF 878 YD: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 879 YD: Youth Development Personnel and Program Management****Prerequisites:** Admission to CYAF graduate program.**Description:** Examines the development, administration and management of youth programs and youth-serving organizations with special focus being on the roles and responsibilities of administrators and managers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**CYAF 880 YD: 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**Grading Option:** Grade Pass/No Pass Option**CYAF 881 Child Illness and the Family****Crosslisted with:** CYAF 481**Prerequisites:** Junior standing or above.**Description:** Discussion of key issues related to working with diverse children and their families who are coping with chronic and acute pediatric health conditions and their treatment. Content will focus on psychosocial challenges associated with pediatric health conditions and approaches to working with pediatric patients to address their needs and specific challenges encountered in hospitalization and ambulatory care contexts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Education Abroad**CYAF 883 FFPLN: 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**Prerequisite for:** CYAF 451, CYAF 851; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CYAF 896 Advanced Independent Study****Crosslisted with:** CYAF 496**Prerequisites:** By Permission**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Research**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**Grading Option:** Pass No-Pass**Course and Laboratory Fee:** \$25**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Internship**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Grading Option:** Pass No-Pass**Course and Laboratory Fee:** \$25**Experiential Learning:** Student Teaching**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CYAF 906 ECFP: Policy Research in Early Childhood****Prerequisites:** CYAF 831 or Permission**Description:** Provides an interdisciplinary perspective on early childhood education and care (ECEC) policy, focusing on the systematic study, analysis, and interpretation of policy. Understand the role that research plays throughout the policy process, learn the main tools used in policy analysis, and to explore different theoretical frames that can be used to interpret and influence current ECEC policy discourse. Become equipped to critically structure a policy problem, as well as to examine and analyze the design, implementation, and outcomes of various policies**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**CYAF 907 ECFP: Policy Leadership and Advocacy in Early Childhood****Prerequisites:** CYAF 831 or Permission**Description:** Designed to provide a foundational knowledge of the fundamentals of policy creation, design, and development, with an emphasis on those policies that impact early childhood education and care (ECEC). Focuses on how policy is constructed and who and what influences that construction.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**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**Grading Option:** Graded**CYAF 920 Teaching Seminar and Practicum****Crosslisted with:** NUTR 920, TMFD 920**Description:** Supervised classroom experiences designed to develop competencies in teaching at the college level.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$50

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CYAF 997

Course and Laboratory Fee: \$35

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

Grading Option: Grade Pass/No Pass Option

CYAF 957 Theory and Practice of Medical Family Therapy

Description: Introduces theory, concepts and practice of medical family therapy. Learn about collaborative healthcare, medical specializations and terminology, assessments commonly used in healthcare settings, and the ways in which biopsychosocial components of patients' and families' lives may impact their experience of health and illness. Begin applying the knowledge and skills learned to clinical practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

CYAF 958 Families, Health, and Illness in a Collaborative Care Context

Description: Gain an in-depth understanding of the impact of illness and disease on individuals, couples, and families. Particular emphasis will be on the meaning individuals and families construct surrounding the illness experience. Learn about the interplay between physical, emotional, interpersonal, and spiritual domains of health and the variety of ways in which people experience illness. Highlights the ways in which medical family therapists can intervene and assist individuals, couples, and families who are coping with illness.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

CYAF 972 Theories of Human Development and Family Relations

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**CYAF 974 Seminar in Infant and Early Childhood Mental Health****Prerequisites:** 12 hrs in CYAF, or social sciences**Description:** Overview of the field of infant mental health and in-depth analysis of research on infant mental health.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$55**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

Civil Engineering (CIVE)

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

CIVE 823 Physical and Chemical Treatment Processes in Environmental Engineering**Prerequisites:** CIVE 420**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**Grading Option:** Grade Pass/No Pass Option**CIVE 824 Solid Waste Management Engineering****Crosslisted with:** CIVE 424**Prerequisites:** CIVE 321, 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**Grading Option:** Grade Pass/No Pass Option**CIVE 826 Design of Water Treatment Facilities****Crosslisted with:** CIVE 426**Prerequisites:** CIVE 420**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**Grading Option:** Grade Pass/No Pass Option**CIVE 827 Design of Wastewater Treatment and Disposal Facilities****Crosslisted with:** CIVE 427**Prerequisites:** CIVE 420**Description:** Analysis of systems for wastewater treatment and disposal.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CIVE 830 Fundamentals of Water Quality Modeling****Crosslisted with:** CIVE 430**Prerequisites:** CIVE 321**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**CIVE 842 Structural Dynamics****Prerequisites:** CIVE 443**Description:** Concepts of Newtonian and Lagrangian mechanics for dynamical systems. Free and forced vibration of linear single-degree-of-freedom systems and multiple degree-of-freedom systems. Harmonic, periodic, pulse, arbitrary, and earthquake response. Numerical evaluation of dynamic response and linear response spectrum concepts. Introduction to non-linear system response. Dynamic response of continuous beams.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CIVE 839; CIVE 849**CIVE 844 Structural Design and Planning****Crosslisted with:** CIVE 444**Prerequisites:** CIVE 440 and CIVE 441.**Notes:** CIVE 444/844 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Offered:** FALL/SPR**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CIVE 954**CIVE 855 Nonpoint Source Pollution Control Engineering****Crosslisted with:** BSEN 455, BSEN 855, CIVE 455**Prerequisites:** BSEN 321/CIVE 321 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**CIVE 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CIVE 891 Special Topics in Civil Engineering****Prerequisites:** Permission**Description:** Special topics in emerging areas of civil engineering which may not be covered in other courses in the civil engineering curriculum.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Graded

CIVE 894 Independent Study in Civil Engineering**Prerequisites:** Permission**Description:** Individual study at the masters level in a selected area of civil engineering under the supervision and guidance of a Civil & Environmental Engineering faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**CIVE 898 Independent Research in Civil Engineering****Prerequisites:** Permission**Description:** Independent research work and written findings, other than thesis or dissertation work, in a selected area of civil and environmental engineering under the supervision and guidance of a Civil & Environmental Engineering faculty member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CIVE 990 Civil Engineering Seminar****Description:** Frontiers of an area of civil engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CIVE 990E Civil Engineering Seminar in Environmental Engineering****Description:** Frontiers of an area of environmental engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Graded**CIVE 990M Civil Engineering Seminar in Geotechnical and Materials Engineering****Description:** Frontiers of an area of geotechnical and materials engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CIVE 990R Civil Engineering Seminar in Structural Engineering****Description:** Frontiers of an area of structural engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CIVE 990T Civil Engineering Seminar in Transportation Engineering****Description:** Frontiers of an area of transportation engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CIVE 990W Civil Engineering Seminar in Water Resources Engineering****Description:** Frontiers of an area of water resources engineering.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**CIVE 991 Advanced Special Topics in Civil Engineering****Prerequisites:** Permission**Description:** Advanced special topics in emerging areas of civil and environmental engineering which may not be covered in other courses in the civil engineering curriculum.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Graded**CIVE 994 Advanced Independent Study in Civil Engineering****Prerequisites:** Permission**Description:** Advanced individual study at the doctoral level in a selected area of civil engineering under the supervision and guidance of a Civil & Environmental Engineering faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

CIVE 998 Advanced Independent Research in Civil Engineering**Prerequisites:** Permission**Description:** Advanced independent research work and written findings, other than thesis or dissertation work, in a selected area of civil engineering under the supervision and guidance of a Civil & Environmental Engineering faculty member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50

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**Grading Option:** Grade Pass/No Pass Option

Communication Studies (COMM)

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

COMM 955 Communication, Medicine, and Health Equity

Description: Emphasizes the role of communication in defining health problems and creating communication-based intervention solutions to improve health equity and reduce preventable differences in health outcomes based on gender, ethnicity, socioeconomic status, geography, age, sexual orientation, disability, and mental health.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

COMM 982 Rhetoric of Social Movements and Counterpublics

Description: Contemporary approaches to scholarship on movements, social protest, and counterpublics within rhetoric and media studies with a focus on hegemony, embodiment, and coalitions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CRPL 991

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**Grading Option:** Graded**Prerequisite for:** CRPL 991**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**CRPL 830 Planning with GIS****Crosslisted with:** CRPL 430**Description:** Theory and practice of spatial analysis and visualization with geographic information systems in planning. Selection and use of computer software and data for problem solving and decision making in community and regional planning and related fields. Various practical applications of geographic information systems, visualization, spatial analytics, geospatial mapping, modeling, and geo-database management. Hands-on training**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** CRPL 432, CRPL 832; CRPL 840; CRPL 990; CRPL 991**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**CRPL 863 Land Use and Transportation Planning****Crosslisted with:** CRPL 463

Description: Explores the connection between transportation planning, land use, and urban form. Review the history and policies that have shaped current transportation systems, and the planning tools available to influence this process. Address planning for multiple modes of transportation (car, bus, bike, walk) and the implications of transportation planning for health, equity, and sustainability.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**CRPL 864 Urban Design****Crosslisted with:** CRPL 464

Notes: The course is interdisciplinary in nature, and students from any academic background are welcome. There are no specific course prerequisites, and students are not required to have any formal training in design.

Description: The history and practice of urban design in planning. Focuses on the overlapping fields of design and planning, as well as the myriad impacts of urban design.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**CRPL 867 Active and Healthy Community Development****Crosslisted with:** CRPL 467

Description: Integrates public health into community planning and design process. Explores how a community's physical environment can have both positive and undesirable influence on human health, physical activity, mental health, safety, air and water pollution, social activity and well-being of its residents. Examines how community planning - such as land development pattern, urban service, housing, zoning, transportation, and land use - has changed walkability, environmental quality, access to services, vulnerable populations, social interaction, quality of life and health conditions. Develops strategies to improve conditions of communities. Utilizes community health impact assessment.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded

CRPL 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

CRPL 889 Urbanization of Rural Landscapes

Crosslisted with: PLAS 489, AGRO 889, CRPL 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

CRPL 892 Selected Topics in Community and Regional Planning

Crosslisted with: CRPL 492

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

Grading Option: Grade Pass/No Pass Option

CRPL 894 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

Grading Option: Pass No-Pass

CRPL 895 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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

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

Grading Option: Graded

CRPL 991 Capstone Studio

Prerequisites: CRPL 800; CRPL 802; CRPL 830

Description: Focuses upon the application of planning principles, planning theory, planning process, and planning techniques, to regions, communities, and urban-scale problems in real-world settings. Opportunities to apply the knowledge and techniques learned in other Community and Regional Planning courses. Develops additional skills and experience in research, analysis, problem-solving, planning, teamwork, and presentation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

Community Development (CDEV)

CDEV 810 Foundations of Community Development

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

CDEV 834 Community Engagement for Civic Change

Notes: This course will be part of the GPIDEA Community Development Specialization and will require permission from the Department
Description: Designed to help students add to their knowledge base and build their confidence in community engagement so that dialogue and deliberations leading to public decision making can be more productive and positive for everyone involved.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

CDEV 835 Government, Politics and Community Development

Description: Introduction to classical and contemporary concepts of federalism, public administration, public policy, and politics with an emphasis on their bearing on community development activities and outcomes.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Graded

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

Grading Option: Graded

CDEV 855 Dynamics of Effective Leadership in Groups & Teams

Crosslisted with: ALEC 455, ALEC 855

Prerequisites: At least Junior standing is required for ALEC 455.

Description: Explore 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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 native 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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Computer Science and Engineering (CSCE)

CSCE 805T Introduction to Computer Science I for Teachers

Notes: This course does not count towards a graduate degree in Computer Science or Computer Engineering.

Description: Introduction to problem solving with computers for teachers. Topics include problem solving methods, software development principles, computer programming, computing in society, and teaching practices for K-12 computer science courses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SUMMER

Prerequisite for: CSCE 806T

CSCE 806T Introduction to Computer Science II for Teachers

Prerequisites: A grade of "P" or "C" or better in CSCE 805T

Notes: Mathematical courses through trigonometry expected. This course does not count towards a graduate degree in Computer Science or Computer Engineering.

Description: Data structures, including linked lists, stacks, queues, and trees; algorithms, including searching, sorting, and recursion; programming language topics, including object-oriented programming; pointers, references, and memory management; design and implementation of a multi-layer application with an SQL database; and teaching practices for K-12 computer science courses.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SUMMER

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CSCE 913; CSCE 914

Course and Laboratory Fee: \$40

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 921**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 923; CSCE 924**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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: 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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-intense 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**Grading Option:** Grade Pass/No Pass Option**CSCE 836 Advanced Embedded Systems****Crosslisted with:** CSCE 436**Prerequisites:** A grade of "P" or "C" or better in CSCE 231, CSCE 336 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40

CSCE 838 Internet of Things**Crosslisted with:** CSCE 438**Prerequisites:** CSCE 230 or CSCE 231; SOFT 260, CSCE 310, CSCE 310H, CSCE 311 or equivalent; senior or graduate standing or instructor permission.**Description:** Theoretical and practical insight into the Internet of Things (IoT). Basics of IoT, including devices and sensors, connectivity, cloud processing and storage, analytics and machine learning, security, business models as well as advanced topics such as localization, synchronization, connected vehicles, and applications of IoT. Includes a group project that provides hands-on interaction with IoT.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 942, MATH 942**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 942, MATH 942**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 942, MATH 942**CSCE 851 Operating Systems Principles****Crosslisted with:** CSCE 451**Prerequisites:** A grade of "P" or "C" or better in CSCE 230 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 455, CSCE 855**Course and Laboratory Fee:** \$20**CSCE 854 Human-Robot Interaction****Crosslisted with:** CSCE 454**Prerequisites:** A grade of "P" or "C" or better in CSCE 156, CSCE 156H, SOFT 161, SOFT 161H, RAIK 184H or CSCE 311.**Notes:** Meeting ACE1 and ACE2 requirements prior to taking this course is recommended. Non-CSCE majors may discuss qualifications with the instructor.**Description:** Introduction to the area of human-robot interaction through the reading and discussion of current peer-reviewed articles on topic to include teleoperation, social robotics, and open questions with field-based or aerial robotic systems. Areas covered include: research methods, experimental design, and identification of problems/open questions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CHME 496, CHME 896**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**CSCE 858 Molecular and Nanoscale Communication****Crosslisted with:** CSCE 458**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:** Completing CSCE 462/862 and CSCE 465/865 prior to taking this course is recommended. Exceptions can be granted on a per-student basis by the instructor.**Description:** Overview of nanoscale communication options. Focus on bio-inspired communication through molecule exchange and biochemical reactions. Different techniques to realize nanomachines will be surveyed in the course, with particular attention to the tools provided by synthetic biology for the programming of biological cooperative systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**CSCE 859 Genetically Engineered Systems****Crosslisted with:** CSCE 459**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:** Completing CSCE/MATH 440/840, MATH 439/839, and CSCE 471/871 prior to taking this course is recommended. Exceptions can be granted on a per-student basis by the instructor. Meeting ACE 1 and ACE 2 requirements prior to taking this course is recommended. Non-CSCE majors may discuss qualifications with the instructor.**Description:** Introduction to the field of synthetic biology, and its interdisciplinary foundational concepts. Presents the technologies at the basis of synthetic biology, together with the engineering concepts that underlie the design, modeling, and realization of genetically engineered systems. Surveys examples of cutting edge applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**CSCE 860 Software Engineering for Robotics****Crosslisted with:** SOFT 460, CSCE 460**Prerequisites:** SOFT 261 or RAIK 284H 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**Grading Option:** Graded**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 284H.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 952; CSCE 953**Course and Laboratory Fee:** \$20

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**Grading Option:** Grade Pass/No Pass Option**CSCE 864 Internet Systems and Programming****Crosslisted with:** CSCE 464**Prerequisites:** A grade of "Pass" or C or better in CSCE 156, SOFT 161, RAIK 184H or CSCE 311 or equivalent programming experience.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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 284H.**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**Grading Option:** Graded**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 284H.**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**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 284.**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20

CSCE 871 Computational Methods in 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:** Introduction to computational methods for tackling challenges in biological data analysis and modeling and understanding complex systems at the molecular and cellular level. The main topics include bio-sequence analysis, motif finding, structure prediction, phylogenetic inference, regulation network modeling, and high-throughput omics data analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Prerequisite for:** CSCE 971**CSCE 872 Digital Image Processing****Crosslisted with:** CSCE 472**Prerequisites:** A grade of "Pass" or C or better in CSCE 156, SOFT 161, RAIK 184H or CSCE 311 or equivalent programming experience.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**CSCE 873 Computer Vision****Crosslisted with:** CSCE 473**Prerequisites:** CSCE 156, SOFT 161, or CSCE 311 or equivalent programming experience.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 976**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**CSCE 879 Introduction to Deep Learning****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.**Notes:** Completing STAT 380/RAIK 270H or ECEN 305 prior to taking this course is recommended.**Description:** Fundamentals and current trends in deep learning. Backpropagation, activation functions, loss functions, choosing an optimizer, and regularization. Common architectures such as convolutional, autoencoders, and recurrent. Applications such as image analysis, text analysis, sequence analysis, and reinforcement learning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$50**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**Grading Option:** Pass No-Pass**Course and Laboratory Fee:** \$10**CSCE 892 Special Topics in Computer Science****Crosslisted with:** CSCE 492**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**CSCE 975 Advanced Multiagent Systems****Notes:** Background in artificial intelligence (AI) or MAS is preferred.

Description: Study of advanced multiagent systems (MAS) in theory, applications, and connections to other AI disciplines, notably in uncertainty reasoning and machine learning. The course is a hybrid of project-based and seminar-based presentations with follow-up discussions. Involve developing and implementing MAS solutions for real-world problems or simulations.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**CSCE 991 Directed Doctoral Research****Prerequisites:** Admission to the doctoral degree program and permission.

Notes: Must be completed successfully before registering for CSCE 999 Doctoral Dissertation Research.

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:** 9**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

CONE 881 Highway and Bridge Construction

Crosslisted with: CONE 481

Prerequisites: Senior standing; 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

Grading Option: Graded

CONE 882 Heavy and/or Civil Construction

Crosslisted with: CNST 482, CNST 882, CONE 482

Prerequisites: CNST 379

Notes: Not open to non-degree graduate students

Description: History, theory, methods, and management principles of planning and executing heavy and/or civil projects. Emerging and new equipment capabilities. Economical use of equipment and management of costs associated with production.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Graded

CONE 885 Construction Planning, Scheduling, and Controls**Crosslisted with:** CNST 485, CONE 485, CNST 885**Prerequisites:** CNST 378**Notes:** Not open to non-degree graduate students**Description:** Planning and scheduling a project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, precedence diagrams, time estimates, critical path, float time, crash programs, scheduling, short interval schedules, pull planning, and monitoring project activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** CNST 489**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

Construction Management (CNST)

CNST 811 Project Administration**Crosslisted with:** CNST 411**Prerequisites:** Junior or senior standing**Notes:** Not open to non-degree graduate students**Description:** Ownership and administration of companies focusing on documentation and specifications, 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**Grading Option:** Graded**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**Grading Option:** Graded**CNST 820 Professional Practice and Ethics****Crosslisted with:** CNST 420**Prerequisites:** CNST 379 and BLAW 300**Notes:** Not open to non-degree graduate students**Description:** Examination of professional practice considering the perspectives of designers and the contractors and their respective relationships to society, specific client types, and other collaborators in the design and construction fields. Focus on ethics, professional communication and responsibility, professional organization, office management, environmental stewardship, professional registration, and owner-designer-contractor relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

CNST 825 Alternative Project Delivery Methods**Crosslisted with:** CNST 425**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**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**Grading Option:** Graded**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**Grading Option:** Graded**CNST 834 The Design-Build Project Delivery System****Crosslisted with:** CNST 434**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** The organizational, managerial, ethical and legal principles involved in design-build as a 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**Grading Option:** Graded**CNST 836 Intent and Application of International Building Code****Crosslisted with:** CNST 436**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** Fundamentals 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**Grading Option:** Grade Pass/No Pass Option**CNST 842 Healthcare Design and Construction****Crosslisted with:** AREN 442, AREN 842, CNST 442**Prerequisites:** Senior or graduate standing**Description:** Introduction to the design and construction of healthcare facilities. Healthcare regulations and standards, infection control, interim life safety measures, code requirements, medical equipment selection and coordination, healthcare design and construction techniques, and best practices will be addressed. Provides guidance in preparation for the Certified Healthcare Constructor credential offered by the American Healthcare Association.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CNST 844 Construction Site Safety Management****Crosslisted with:** CNST 444**Prerequisites:** CNST 241 or CONE 319**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. Not open to non-degree graduate students**Description:** Introduction to 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Experiential Learning:** Case Work, Field Studies, Leadership**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

CNST 880 Productivity and Human Factors in Construction**Crosslisted with:** CNST 480**Prerequisites:** CNST 379 and senior standing**Notes:** Not open to non-degree graduate students**Description:** Motivation and productivity improvement methods for management in typical job environments. Methods to improve working environments in the field and 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CNST 489**CNST 882 Heavy and/or Civil Construction****Crosslisted with:** CNST 482, CONE 482, CONE 882**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** History, theory, methods, and management principles of planning and executing heavy and/or civil projects. Emerging and new equipment capabilities. Economical use of equipment and management of costs associated with production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**CNST 885 Construction Planning, Scheduling, and Controls****Crosslisted with:** CNST 485, CONE 485, CONE 885**Prerequisites:** CNST 378**Notes:** Not open to non-degree graduate students**Description:** Planning and scheduling a project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, precedence diagrams, time estimates, critical path, float time, crash programs, scheduling, short interval schedules, pull planning, and monitoring project activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** CNST 489**CNST 886 Construction Management Systems****Crosslisted with:** CNST 486**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students.**Description:** Application of selected topics in systems analysis (operations research). 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 industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Offered:** SUMMER**CNST 898 Special Topics in Construction Management****Crosslisted with:** CNST 498**Prerequisites:** Permission.**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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

Criminology and Criminal Justice (CRIM)

CRIM 801D Nature of Crime**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 802 Administration of Justice****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 803 Research Theory & Methodology****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 804 Seminar Police & Soc****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 805 Corrections Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 808 Juvenile Justice Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**CRIM 819 Independent Study****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 831 Correctional Law****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**CRIM 899V Masters Thesis****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 99**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: AECN 868

Groups: Econometrics

Experiential Learning: Case Work, Research

ECON 819 Topics in Applied Research

Crosslisted with: ECON 419

Prerequisites: ECON 311A or ECON 312B and ECON 312A or ECON 312B

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

Grading Option: Graded

Offered: FALL

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Groups:** Comp Intrntnl & Reg Developmnt**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**Groups:** Industrial Organization&Reg

ECON 840 Regional Development**Crosslisted with:** ECON 440**Prerequisites:** ECON 210, or both ECON 211 and ECON 212; ECON 215

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**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Groups:** General Economics and Theory**Experiential Learning:** Research**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ECON 857 19th Century United States Economic History****Crosslisted with:** ECON 457, HIST 857, HIST 457**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.

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**Grading Option:** Graded

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**Grading Option:** Graded**ECON 866 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, HIST 479, HIST 879**Prerequisites:** Senior standing and permission.**Notes:** Open to students with an interest in international relations.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**ECON 871 Public Finance****Crosslisted with:** ECON 471**Prerequisites:** ECON 210, or both ECON 211 and ECON 212; ECON 312.**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**Grading Option:** Graded**Prerequisite for:** ECON 971**Groups:** Public Finance**Experiential Learning:** Field Studies**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**Grading Option:** Graded**Groups:** Public Finance**Experiential Learning:** Field Studies**ECON 873 Microeconomic Models and Applications****Crosslisted with:** AECN 873**Notes:** Prerequisites: ECON 311, 312 and Math 104 or Math 106 or equivalent, or permission of instructor**Description:** 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Prerequisite for:** AECN 818; AECN 840; AECN 868**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**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**Grading Option:** Graded**Groups:** Labor Economics**ECON 885 The Regulatory Environment for Employment and Labor****Crosslisted with:** ECON 485, MNGT 466, MNGT 866**Prerequisites:** Junior standing; MNGT 361**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**ECON 900 Seminar in Economic Theory and Policy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**ECON 903 Seminar in Monetary Economics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ECON 923 Seminar in Development Economics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ECON 927 Seminar in Industrial Organization****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ECON 954 Seminar in Economic Education Research****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECON 977**ECON 972 Fiscal Theory and Its Applications****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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECON 977**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**Grading Option:** Grade Pass/No Pass Option**ECON 977 Seminar in Public Finance****Prerequisites:** ECON 971 and 972**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

ECON 981 Seminar in Labor Economics**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDAD 811 P-12 Internship****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**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDAD 985**EDAD 835 District-Level School Finance****Description:** The role of P-12 district leadership in school finance, including tools for efficient and equitable management of operations; local, state, and federal finance and policy processes; and communication of financial information with multiple stakeholders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**EDAD 836 Leadership Management and Supervision in Student Affairs****Description:** Introduction to concepts related to educational leadership, identity conscious supervision in higher education, and other higher education management topics including budgeting. Exploration of topics including supervision, hiring, professional development, personnel evaluation, budgeting, politics, and planning.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$25

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

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**Grading Option:** Grade Pass/No Pass Option**EDAD 858 Special Education Law****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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDAD 890 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDAD 893 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: EDAD 919

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDAD 905 Issues in Governance of Educational Institutions

Description: Examination of how P-20 educational systems are structured, including critiques of those structures through new and emerging frameworks to understand why and how they work. Includes governance of educational institutions at the federal, state, and institutional level, and the impact of demographic, social, legal, political, and financial influences on governance.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDAD 919 Social and Political Contexts of Educational Administration

Prerequisites: EDAD 900 or equivalent, or by permission of the instructor

Description: Engagement with philosophical and theoretical analyses of sociocultural conditions of educational leadership and research, from different disciplinary perspectives, including how the educational research enterprise has been both complicit in and disruptive of unjust educational endeavors. Positioning of particular areas of inquiry within enduring issues and challenges of education.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDAD 929 Organizational Theory and Change

Description: Explore the study of P-20 educational leadership, organizational theory and the various ways to research, navigate, and lead organizational change efforts.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDAD 935 Workforce, Economic, and Community Development

Prerequisites: Admission to an EDAD graduate program or instructor permission

Description: Workforce, economic and community development role of education within the broader context of recent economic, social, and technological changes in communities, society, and the economy. Focuses on partnerships and policies as a lever for systems-level improvement in community level outcomes. Applicable to P-20 leaders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$30

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDAD 983 Qualitative Methods for Educational Administration Research

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: EDAD 984B; EDAD 984E

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

Grading Option: Grade Pass/No Pass Option

EDAD 984B Qualitative Techniques - Case Study Methods

Prerequisites: EDAD 983 or equivalent

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

EDAD 984E Qualitative Techniques - Grounded Theory in Educational Administration

Prerequisites: EDAD 983 or equivalent

Description: An advanced qualitative methods course providing an introduction to grounded theory methodology in educational administration research. Provides an overview of the history and development of grounded theory methodology, different traditions of grounded theory methods, and specific application of grounded theory methods in educational administration.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**EDAD 990 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDAD 993 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 961; EDPS 962; EDPS 963**EDPS 851 Psychology of Adolescence****Crosslisted with:** EDPS 451**Notes:** Prior coursework in psychology or a related field is recommended.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$125**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ABUS 341, MRKT 341; BLAW 371; BLAW 371H; ECON 311A; ECON 311B; ECON 312A; ECON 312B; EDAD 892, EDPS 892, EDUC 892, SPED 892, TEAC 892, CYAF 892; EDPS 470, EDPS 870; EDPS 860; EDPS 936; EDPS 941; EDPS 942; EDPS 969; FINA 361; FINA 361H; MNGT 301; MNGT 301H; MUED 980; NUTR 486, NUTR 886; SCMA 250; SCMA 331; SCMA 350; SCMA 350H; STAT 318; TEAC 924**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** 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**Grading Option:** Grade Pass/No Pass Option**EDPS 868 Multicultural Counseling****Prerequisites:** Permission**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**Grading Option:** Grade Pass/No Pass Option

EDPS 869 Psychopathological Disorders of Childhood and Adolescence

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

Grading Option: Grade Pass/No Pass Option

EDPS 870 Introduction to Educational and Psychological Measurement

Crosslisted with: EDPS 470

Prerequisites: EDPS 459/859

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: EDPS 970

EDPS 871 Human Sexuality and Society

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

Prerequisites: Junior or Senior 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

Grading Option: Grade Pass/No Pass Option

EDPS 877 Fostering the Emotional Well-Being of Students in Schools

Description: Prepares school mental health professionals to use a dual-factor model of child and adolescent mental health that integrates wellness and pathology into a single multi-tier system of complete mental health support. Emphasis is given to the mental health needs of the broader school community, the resources that schools can draw from to meet those needs, and the models for school mental health services that can be used to strengthen school-aged students' psychological well-being and address their psychological stresses and disorders.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

EDPS 878 Pro-seminar in Latin American Studies

Crosslisted with: HIST 478, POLS 478, EDPS 478, HIST 878, POLS 878

Prerequisites: Junior standing and permission.

Description: An interdisciplinary analysis of topical issues in Latin American Studies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

EDPS 896 Directed Field Experience

Crosslisted with: EDPS 496

Prerequisites: Permission of instructor.

Description: Complete education-based experiences in research or applied settings under faculty supervision.

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Grading Option: Grade Pass/No Pass Option

EDPS 898 Special Topics

Crosslisted with: EDPS 498

Prerequisites: Permission of instructor.

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDPS 900K Qualitative Approaches to Educational Research

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: EDPS 936

EDPS 910 Applied Social Psychology in Education

Description: Provides basic understanding of human behavior within social and cultural contexts. The knowledge of social psychology is applicable to various educational settings, including child-parent-teacher interaction, learning environment, and therapeutic interaction. Aims to help (1) understand classical and contemporary theories and research of social psychology and (2) cultivate ability to apply social psychological theories to educational research interests.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDPS 935 Seminar in Qualitative Research****Crosslisted with:** TEAC 935**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDPS 941 Intermediate Statistics: Experimental Methods****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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 942**EDPS 942 Intermediate Statistics: Correlational Methods****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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**EDPS 950 Intellectual Assessment****Prerequisites:** Department Consent Required**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:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$125**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$125**EDPS 952 Systems of School-Based Consultation****Description:** Familiarize with consultation theory, practice, and research with particular emphasis on case-centered behavioral consultation. Case-centered consultation is presented within a broader framework for intervention design for academic and behavioral problems. Learn how to integrate consultation into school-based professional practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**EDPS 953 Personality Assessment****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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** EDPS 956**Course and Laboratory Fee:** \$120**EDPS 954 School Mental Health and Behavior Interventions****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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$100**EDPS 956 Projective Psychological Assessment****Prerequisites:** EDPS 953 or EDPS Doctoral Student**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING

EDPS 958A Internship in School Psychology**Prerequisites:** Permission**Description:** Full-time supervised practice of school psychology in the facilities of public or private schools of educational service agencies.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**EDPS 959 Professional Psychology Internship (Doctoral)****Prerequisites:** Permission**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 15**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDPS 962 Research Literature in Personality and Social Development****Prerequisites:** EDPS 850 or EDPS 851 or EDPS 984**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDPS 964 Counseling Theories and Intervention Techniques****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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 997A**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**EDPS 970 Theory and Methods of Educational Measurement****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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 980**EDPS 971 Structural Equation Modeling****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**Grading Option:** Grade Pass/No Pass Option**EDPS 972 Multivariate Analysis****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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Course and Laboratory Fee:** \$60**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**EDPS 980 Item Response Theory****Prerequisites:** EDPS 970**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$125**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$100**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** EDPS 962**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

EDPS 989 Psychology of Reading and Writing

Crosslisted with: TEAC 989

Notes: 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

EDPS 993 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

EDPS 997A Practicum in Counseling

Prerequisites: EDPS 866

Description: Supervised laboratory clinic-based experiences in counseling.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$100

EDPS 997B Field Placement in Counseling

Description: Supervised field experiences in school counseling, college student personnel, and community social service agencies.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 21

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

Course and Laboratory Fee: \$25

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$25

EDPS 997G Advanced Practicum in Counseling

Description: Supervised counseling experience in university, schools, and community agencies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Grading Option: Grade Pass/No Pass Option

Prerequisite for: EDPS 997E

Course and Laboratory Fee: \$100

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

ECEN 806 Power Systems Analysis

Crosslisted with: ECEN 406

Prerequisites: ECEN 338 or ECEN 838

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

Grading Option: Graded

Prerequisite for: ECEN 957

ECEN 807 Power Systems Planning

Crosslisted with: ECEN 407

Prerequisites: ECEN 305

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

Grading Option: Graded

ECEN 808 Engineering Electromagnetics

Crosslisted with: ECEN 408

Prerequisites: ECEN 306.

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

Grading Option: Graded

ECEN 810 Multivariate Random Processes

Crosslisted with: ECEN 410

Prerequisites: ECEN 305

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

ECEN 817 Semiconductor Fundamentals II**Crosslisted with:** ECEN 417**Prerequisites:** ECEN 421 or ECEN 821**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**ECEN 824 Digital Signal Processing****Crosslisted with:** ECEN 424**Prerequisites:** ECEN 355**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECEN 815; ECEN 926**ECEN 828 Power Electronics****Crosslisted with:** ECEN 428**Prerequisites:** ECEN 304 and ECEN 316**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**ECEN 833 Microprocessor System Design****Crosslisted with:** ECEN 433**Prerequisites:** ECEN 310 with a grade of "C" or better; ECEN 332 with a grade of "C" or better.**Description:** Discussion of different microprocessor hardware and software systems designs including; microprocessor bus interfacing, memory systems, peripheral design and interfacing, interrupts, Direct Memory Access, and other hardware related topics. Software includes system code, firmware generation, and designing device drivers. Design, build, program, and show successful operation of a microprocessor board with memory, I/O and other related peripheral systems.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ECEN 435, ECEN 835; ECEN 496**Course and Laboratory Fee:** \$25**ECEN 835 Embedded Microcontroller Design****Crosslisted with:** ECEN 435**Prerequisites:** ECEN 433/833 with a grade of "C" or better; ECEN 305**Notes:** The prerequisite is different from the syllabus.**Description:** Microcontroller architecture: design, programming, and interfacing for embedded systems. Including advanced RISC based microcontroller architecture and design, standard asynchronous and synchronous serial communications, I2C, SPI, USB, and related board design, development, and fabrication with surface mount technology. Design, build, program and show successful operation of a single microcontroller board with a specific application.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ECEN 437, ECEN 837**Course and Laboratory Fee:** \$25

ECEN 836 Electric Machines**Crosslisted with:** ECEN 436**Prerequisites:** PHYS 212/(UNO) PHYS 2120 and ECEN 216**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECEN 932**ECEN 837 Parallel and Distributed Processing****Crosslisted with:** ECEN 437**Prerequisites:** ECEN 435/835**Description:** Parallel and distributed processing concepts, principles, techniques, and machines.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ECEN 838 Integrated Systems Programming****Crosslisted with:** ECEN 438**Prerequisites:** ECEN 310 and ECEN 332**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**Grading Option:** Graded**Offered:** FALL/SPR**Prerequisite for:** ECEN 406, ECEN 806**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**Grading Option:** Graded**ECEN 844 Linear Control Systems****Crosslisted with:** ECEN 444**Prerequisites:** ECEN 304**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**Grading Option:** Graded**ECEN 848 Decision Analysis****Crosslisted with:** ECEN 448**Prerequisites:** ECEN 305 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**Grading Option:** Grade Pass/No Pass Option**ECEN 850 Bioinformatics****Crosslisted with:** ECEN 450**Prerequisites:** Computer programming language and ECEN 305 or MECH 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**Grading Option:** Grade Pass/No Pass Option**ECEN 851 Introduction to VLSI System Design****Crosslisted with:** ECEN 451**Prerequisites:** ECEN 310**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**Grading Option:** Grade Pass/No Pass Option**ECEN 852 Introduction to Computer-Aided Digital Design****Crosslisted with:** ECEN 452**Prerequisites:** ECEN 310**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**Grading Option:** Grade Pass/No Pass Option

ECEN 853 Computational and Systems Biology**Crosslisted with:** ECEN 453**Prerequisites:** By permission.**Notes:** Basic knowledge of probability and statistics (e.g. ECEN 305 or STAT 380) and basic programming skills are recommended. May also be taught as a distance course for the Omaha campus.**Description:** Provides the required biology primer and covers functional genomics, transcriptomics, differential expression, clustering, classification, prediction, biomarker discovery, pathway analysis and network based approaches to high throughput biological data analysis. Includes the development of databases, algorithms, web-based and other tools regarding management and analysis of life science data. Areas of study include DNA, RNA, and protein sequence analysis, functional genomics and proteomics, 3D macromolecule structure prediction, and systems/network approach.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**ECEN 854 Power Systems Operation and Control****Crosslisted with:** ECEN 454**Prerequisites:** ECEN 338**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**ECEN 861 Digital Communications Media****Crosslisted with:** ECEN 461**Prerequisites:** ECEN 325 or ECEN 462**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** ECEN 466, ECEN 866; ECEN 479, ECEN 879; ECEN 885; ECEN 977**Course and Laboratory Fee:** \$60**ECEN 862 Communication Systems****Crosslisted with:** ECEN 462**Prerequisites:** ECEN 304 and ECEN 305**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**Grading Option:** Graded**Prerequisite for:** ECEN 911**ECEN 863 Digital Signal Processing****Crosslisted with:** ECEN 463**Prerequisites:** ECEN 304**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**Grading Option:** Graded**Prerequisite for:** ECEN 915**ECEN 864 Digital Communication Systems****Crosslisted with:** ECEN 464**Prerequisites:** ECEN 462**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**Grading Option:** Graded**Prerequisite for:** ECEN 911; ECEN 912; ECEN 959**ECEN 865 Introduction to Data Compression****Crosslisted with:** ECEN 465**Prerequisites:** ECEN 305**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**Grading Option:** Graded**ECEN 866 Telecommunications Engineering I****Crosslisted with:** ECEN 466**Prerequisites:** ECEN 362; ECEN 461/861 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**Grading Option:** Grade Pass/No Pass Option

ECEN 867 Electromagnetic Theory and Applications**Crosslisted with:** ECEN 467**Prerequisites:** ECEN 306**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**Grading Option:** Graded**Prerequisite for:** ECEN 965**ECEN 868 Microwave Engineering****Crosslisted with:** ECEN 468**Prerequisites:** ECEN 306**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**Grading Option:** Graded**Prerequisite for:** ECEN 965**ECEN 869 Analog Integrated Circuits****Crosslisted with:** ECEN 469**Prerequisites:** ECEN 361**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**Grading Option:** Graded**Prerequisite for:** ECEN 913**ECEN 870 Digital and Analog VLSI Design****Crosslisted with:** ECEN 470**Prerequisites:** ECEN 316; ECEN 370 or ECEN 313**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**Grading Option:** Graded**ECEN 871 Computer Communication Networks****Crosslisted with:** ECEN 471**Prerequisites:** ECEN 325**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**Grading Option:** Grade Pass/No Pass Option**ECEN 873 Mobile and Personal Communications****Crosslisted with:** ECEN 473**Prerequisites:** ECEN 325**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**Grading Option:** Grade Pass/No Pass Option**ECEN 874 Digital Systems****Crosslisted with:** ECEN 474**Prerequisites:** ECEN 370**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**Grading Option:** Graded**Prerequisite for:** ECEN 477, ECEN 877**ECEN 875 Satellite Communications****Crosslisted with:** ECEN 475**Prerequisites:** ECEN 325**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECEN 926; ECEN 977**ECEN 877 Digital Systems Organization and Design****Crosslisted with:** ECEN 477**Prerequisites:** ECEN 474 or ECEN 874**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**Grading Option:** Graded

ECEN 879 Optical Fiber Communications**Crosslisted with:** ECEN 479**Prerequisites:** ECEN 461/861**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ECEN 882 Antennas and Radio Propagation for Wireless Communications****Crosslisted with:** ECEN 482**Prerequisites:** ECEN 328**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECEN 926**ECEN 884 Network Security****Crosslisted with:** ECEN 484**Prerequisites:** ECEN 325**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ECEN 886 Applied Photonics****Crosslisted with:** ECEN 486**Prerequisites:** ECEN 306**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**Grading Option:** Graded**Prerequisite for:** ECEN 986**ECEN 888 Wireless Security****Crosslisted with:** ECEN 488**Prerequisites:** ECEN 325**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ECEN 971 Seminar

Credit Hours: 1-12

Min credits per semester: 1

Max credits per semester: 12

Max credits per degree: 12

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

Engineering (ENGR)

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: ENGR 919

Course and Laboratory Fee: \$15

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

Grading Option: Graded

Prerequisite for: ENGR 919

Course and Laboratory Fee: \$15

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

Grading Option: Graded

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

Grading Option: Graded

ENGR 824 Unique Concerns of Engineering Education

Description: The purposes and contexts of engineering education will be illuminated through readings and discussions of its historical roots, current expressions, and future directions. Discussions will delve into the history and trajectory of engineering education and concerns that are uniquely engineering (e.g., engineering design, diversity and inclusion, and teaming).

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ENGR 833 Evidence-Based STEM Teaching Strategies

Description: This learning experience is designed to provide graduate level training on teaching at the postsecondary level. Evidence-based teaching methods applicable to Science, Technology, Engineering, and Mathematics (STEM) will be investigated and a learner-based pedagogy will be used to engage those in the course to experience STEM practices. The common element of problem solving is emphasized across all STEM disciplines allowing for discovery, exploration, and application of critical thinking skills. Primary tasks include developing a unit on Canvas that includes learning outcomes, lecture and activities, and assessments, a teaching philosophy, and engaging with technologies that support and enhance teaching and learning.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

ENGR 834 Framing STEM Education Research

Description: Introduction to the basic types of research study designs (quantitative, qualitative, and mixed methods) through examples in STEM education. Learn to identify an educational problem in STEM education, pose a research question, and support the need for a study through literature review. Become familiar with how theories of learning and thinking are used to predict or explain research findings. Become familiar with the protection of human subjects and gain certification for human subjects research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Graded

Course and Laboratory Fee: \$15

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**ENGR 891 Special Topics in Engineering****Description:** Subject matter in emerging areas of engineering and closely related areas which are not covered in other courses in the College of Engineering graduate programs. 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**Grading Option:** Grade Pass/No Pass Option**ENGR 895 Engineering Graduate Internship****Description:** Apply theory learned in the classroom and experience hands-on applications through employment in industry. Gain practical application experience of engineering disciplines.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Grading Option:** Pass No-Pass**Offered:** SUMMER**ENGR 898 Independent Research in Engineering****Prerequisites:** Permission**Description:** Independent research work and written findings, other than thesis or dissertation work, in a selected area of engineering under the supervision and guidance of a College of Engineering faculty member.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**ENGR 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major adviser**Description:** Masters Thesis**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded

ENGR 998 Advanced Independent Research in Engineering

Prerequisites: Admission to master's degree program and permission of major adviser

Description: Advanced independent research work and written findings, other than thesis or dissertation work, in a selected area of engineering under the supervision and guidance of a College of Engineering faculty member.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

ENGR 999 Doctoral Dissertation

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

Description: Doctoral Dissertation

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Grading Option: Grade Pass/No Pass Option

Engineering Management (EMGT)

EMGT 803 Management of Engineering and Technology

Prerequisites: Graduate Standing

Description: Covers the evolution of technical management and the transition from engineering and technical work to engineering and technology management. Emphasizes developing a broad understanding of the management functions of planning, organizing, leading and controlling in a technological environment. Engineering ethics and managing technology are also covered.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 804 Human Relations in Engineering and Sciences

Prerequisites: Graduate Standing or Permission from Program Director

Notes: Engineering work experience is required.

Description: Provides a framework for the student to become proficient in recognizing, understanding, and predicting morale and discipline when managing in the technology industry. Includes case studies related to engineering, technology, and sciences, emphasizing the prevention of and solutions to problems unique to technical employees by means of appropriate policies, techniques, practices, and procedures. Group dynamics from the psychological and sociological perspectives of varying corporate situations related to engineering and science will also be examined.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 805 Teamwork for Organizational Commitment and Collaboration

Prerequisites: Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Designed for Engineers working in the field.

Description: Provides an overview of the role that groups and teams play in achieving organizational success. Essential theories and concepts provide a framework for understanding and analyzing how teams are formed and function, including socioemotional and sociotechnical considerations. Critical issues in leading teams and managing team effectiveness are examined, including but not limited to power, influence, and conflict.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

EMGT 806 Decision and Risk Analysis

Prerequisites: BSEN 206; MECH 321 or STAT 380/MATH 380/STAT 880.

Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Designed for Engineers working in the field.

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

Grading Option: Graded

Offered: FALL

EMGT 807 Project Management

Prerequisites: Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Designed for Engineers working in the field.

Description: Covers the fundamentals of successful project management. Topics include project selection, planning and control, budgeting and cost estimation, scheduling and resource allocation, project termination, and performance measurement using key indicators.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SUMMER

EMGT 808 Engineering Leadership

Prerequisites: Graduate Standing. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Engineering work experience is required, but may be waived at the discretion of MEM program director or the faculty teaching the course.

Description: Provides a framework to become more proficient in recognizing, understanding, predicting, and controlling the dynamics and outcomes of organizational behavior. Introduction to a variety of contemporary leadership theories and provide some suggested methods for developing leadership capacity at the individual and organizational levels.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

EMGT 809 Engineering Economy for Decision Making

Prerequisites: Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Description: Applies economic and financial analysis to engineering projects and the operation of the firm. Concepts and methods help engineering and technology managers to make investment and funding decisions regarding projects, programs, products, business expansions, and other alternatives using the financial calculations involving time value of money, uncertainty, and risk. Topics include mutually exclusive projects, net present value, rate of return, constrained project selection, and the effect of taxes and depreciation on project analysis.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 811 Legal Considerations for Engineering Managers

Prerequisites: Graduate Standing. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Engineering work experience is required, but may be waived at the discretion of MEM program director or the faculty teaching the course.

Description: Covers legal issues and considerations that engineering firms face. Provides a general understanding of the basic legal principles applicable to the practice of engineering and the performance of engineering services. Topics include an overview of the U.S. legal system; business entity choices and licensing; tort and statutory liability; contract negotiation and terms; project delivery, management, and insurance; and dispute resolution.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 819 Applied Management Science for Engineering and Operations

Prerequisites: Graduate standing, and MECH 321 or MATH 380 or equivalent course in probability & statistics. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Engineering work experience is required, but may be waived at the discretion of MEM program director or the faculty teaching the course.

Description: Introduces optimization methods for decision making and planning. Several management science models and their application to engineering and operations management are covered. Emphasis is on problem formulation, software solution, and interpretation for application and decision-making. Topics include: linear programming and its applications such as product mix, blending, multi-period scheduling; data envelopment analysis; distribution models (transportation, transshipment, assignment); network flow models (shortest route, minimal spanning tree, maximal flow); integer programming and nonlinear programming.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 820 Quantitative Analysis for Engineering Management Decisions

Prerequisites: Graduate standing, and MECH 321 or MATH 380 or equivalent course in probability & statistics. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Engineering work experience is required, but may be waived at the discretion of MEM program director or the faculty teaching the course.

Description: A working knowledge of the topics is essential for an engineering manager to effectively conduct business and communicate with internal and external members of work unit and organization. Emphasis is on problem formulation, software solution, and interpretation for application and decision-making. Topics are: decision analysis, multi-criteria decision making, queuing theory, project management, simulation, forecasting, and inventory management.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 822 Production and Operations Management

Prerequisites: Graduate Standing

Description: Covers principles and issues regarding production and technical operations for the engineering manager. Topics and techniques for the management of manufacturing and services in engineering and technology environments are emphasized including a focus on manufacturing and business processes, lean systems, factory physics, and constraints management. Case studies and spreadsheet modeling are used to relate concepts to real-world technical operations applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

EMGT 891 Special Topics in Engineering Management

Prerequisites: Graduate Standing. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

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: 3

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Graded

EMGT 901 Total Quality Management Using Six Sigma Techniques

Prerequisites: MECH 321 or equivalent. Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Designed for Engineers working in the field.

Description: Statistical quality control and improvement is more than an engineering concern. Quality management is a major business strategy for increasing productivity and gaining competitive advantage in all industries and types of organizations. Covers differing perspectives and definitions of quality; tools and techniques for managing quality and continuous improvement; statistical methods; creation and interpretation of variable and attribute control charts; and Six Sigma tools for detection and isolation of sources of variation, process control, and capability analysis. The goal is to develop an operational use and familiarity with contemporary methods that are effective in managing quality, including Six Sigma.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

EMGT 905 Strategic Management and Planning

Prerequisites: Students admitted into the MEM degree program or the Graduate Certificate in Engineering Management get priority enrollment. Other students require permission.

Notes: Designed for Engineers working in the field.

Description: Creating new and innovative business and corporate entrepreneurship requires a strategic vision to inform and align decision making at all organizational levels. Focuses on strategies that a firm could apply to design a structure for becoming a learning and ethical organization, to create value, and to develop and sustain competencies to gain competitive advantage in the market.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Engler Agribusiness Entrepreneurship Program (EAEP)

EAEP 888 Entrepreneurship and Enterprise Development

Crosslisted with: PLAS 488, HORT 888, EAEP 488, ENTR 488, AGRO 888, ENTR 888, ABUS 488

Description: The process of starting your own enterprise. Competitive environment, risk management, finance for business startups, funding, and business plan writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

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

Grading Option: Grade Pass/No Pass Option

English (ENGL)

ENGL 801 Drama

Crosslisted with: ENGL 401

Prerequisites: Junior or senior standing and one of the following: ENGL 200, ENGL 205, ENGL 206, ENGL ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ENGL 802 Poetry**Crosslisted with:** ENGL 402**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 261.**Description:** Epic, Renaissance, Romantic, Victorian, American, and contemporary poetry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ENGL 802L Romantic Poetry****Crosslisted with:** ENGL 402L**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 803 American Short Story****Crosslisted with:** ENGL 403**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 805 Fiction****Crosslisted with:** ENGL 405**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 805A 19th Century British Novel****Crosslisted with:** ENGL 405A**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 805B 18th Century British Novel****Crosslisted with:** ENGL 405B**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 805E Modern Fiction****Crosslisted with:** ENGL 405E**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

ENGL 805M American Novel I**Crosslisted with:** ENGL 405M**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 805N American Novel II****Crosslisted with:** ENGL 405N**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 806 Genre****Crosslisted with:** ENGL 406**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 810 Studies in Literary Movements****Crosslisted with:** ENGL 410**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 814B Modern and Contemporary Women Writers****Crosslisted with:** ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 817 Topics in Place Studies and Environmental Humanities****Crosslisted with:** ENGL 417**Prerequisites:** Junior or senior standing.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 830 British Authors to 1800****Crosslisted with:** ENGL 430**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 830A Shakespeare I****Crosslisted with:** ENGL 430A**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**ENGL 832 American Authors to 1900****Crosslisted with:** ENGL 432**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 833 American Authors Since 1900****Crosslisted with:** ENGL 433**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 845 Ethnic Literature****Crosslisted with:** ENGL 445, ETHN 445**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 852 Fiction Writing****Notes:** ENGL 852 is for advanced students with previous experience in fiction writing.**Description:** Longer projects in fiction writing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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:** 9**Grading Option:** Grade Pass/No Pass Option**ENGL 853 Writing of Poetry****Description:** For advanced students with previous experience in poetry writing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**Groups:** Creative Writing**ENGL 854 Advanced Writing Projects****Description:** Advanced writing workshop in which experienced writers develop extended projects in writing, analyze their own and others' writing processes, and read widely in genres related to their projects.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 862 Survey of Medieval Literature****Crosslisted with:** ENGL 462**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

ENGL 864 British Literature, 1660-1800**Crosslisted with:** ENGL 464**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 865 Nineteenth-Century British Literature****Crosslisted with:** ENGL 465**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**ENGL 867 Literary History****Crosslisted with:** ENGL 467**Prerequisites:** Junior or senior standing and one of the following courses: ENGL 200, ENGL 205, ENGL 206, ENGL 208, ENGL 212, ENGL 215, ENGL 216, ENGL 230, ENGL 230A, ENGL 231, ENGL 242, ENGL 244, ENGL 260, or ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 881 GESL/Academic Research****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 889 Medieval Literature and Theology****Crosslisted with:** ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**ENGL 892 Special Topics in English****Crosslisted with:** ENGL 492**Prerequisites:** Senior standing.**Description:** Topics vary.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**ENGL 895 Internship in English****Prerequisites:** Permission**Description:** Each participant commits to developing an internship project, in which they will explore teaching writing with technology, editing, publishing, community engagement, and/or pedagogy.**Credit Hours:** 0-3**Min credits per semester:****Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Experiential Learning:** Internship**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

ENGL 896 Independent Study in English**Prerequisites:** Permission.**Description:** Directed reading or research.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 901 Seminar in Drama****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**ENGL 902 Seminar in Poetry****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 913 Studies in Film****Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option**ENGL 915 Popular Literature****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 927 Stylistics****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 953 Seminar in Creative Writing****Description:** The course has three elements: workshop, seminar, and discussion of the teaching of creative writing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENGL 970 Literary Theory****Credit Hours:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ENGL 988 Introduction to the Interdisciplinary Study of the Middle Ages

Crosslisted with: AHIS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ENGL 991 Nebraska Literature Project

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

ENGL 995 Teaching of Literature

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Grading Option: Grade Pass/No Pass Option

ENGL 996 Bibliography and Methods

Credit Hours: 3-4

Min credits per semester: 3

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Grade Pass/No Pass Option

ENGL 997 Independent Directed Reading

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 24

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**ENTO 805 Introduction to Entomology****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**Grading Option:** Graded**Offered:** FALL/SPR**Prerequisite for:** ENTO 412, ENTO 812; ENTO 800**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816B; AGRO 816E**Course and Laboratory Fee:** \$40**ENTO 816 Forensic Insect Succession****Crosslisted with:** ENTO 416**Description:** Forensic insect succession and specific forensically important insects including their life cycle, biology, and association with decomposition. Case studies about how forensic entomology has been used in solving crimes will also be covered.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**ENTO 822 Cultural Entomology****Description:** Introduction to how insects and related arthropods have influenced human culture historically and in scientific discovery. Topics include the medical impact of insects on mankind, including widespread disease transmission, use in warfare, and therapeutic medicine. Explores how insects are represented by indigenous peoples and in Western popular culture through artifacts like visual art, literature, and music. Human perception regarding insects is also examined through the many benefits that arthropods provide, including use as food and feed and consumer product goods and services.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**ENTO 850 Forensic Insect Morphology****Description:** Comparative study of major insect external structures, emphasizing the various modifications that are important in the success of insects. Introduces the morphological (structure and function) features of insects, both in general as well as highlighting some major orders of forensic importance and the characteristics that define and differentiate the families within these orders. Identifying families and species of insects collected at a crime scene can be essential in determining accurate post-mortem interval (PMI).**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded**Offered:** SUMMER

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**Grading Option:** Grade Pass/No Pass Option**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ENTO 996 Research in Entomology****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**ENTO 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Description:** Research credits required for a doctoral dissertation for completion of degree.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 55**Grading Option:** Pass No-Pass

Entrepreneurship (ENTR)

ENTR 821 Identifying and Exploring Entrepreneurial Opportunities

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

ENTR 888 Entrepreneurship and Enterprise Development

Crosslisted with: PLAS 488, HORT 888, EAEP 488, ENTR 488, EAEP 888, AGRO 888, ABUS 488

Description: The process of starting your own enterprise. Competitive environment, risk management, finance for business startups, funding, and business plan writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

Environmental Engineering (ENVE)

ENVE 851 Soils, Water, and Environmental Chemistry

Crosslisted with: NRES 451, NRES 851

Prerequisites: NRES/WATS/SOIL/PLAS/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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**ETHN 889 Histories of Inclusion & Exclusion in US Education****Crosslisted with:** HIST 489, ETHN 489, HIST 889**Prerequisites:** Junior or Senior Standing**Description:** Examination of the history of education in the United States from the colonial era to the present. Focus on shifts in formal educational policy and the influence of those policies on diverse demographic groups. Themes include the emergence of a public and private school systems, the spread of segregated schools, the development of curricular standards, the history of teachers, the push for desegregation, as well as debates over students' rights, language, affirmative action, and the public/private nature of charter schools, especially in terms of social justice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SUMMER**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded

Finance (FINA)

FINA 801 Quantitative Methods in Finance**Prerequisites:** Admission to MS Finance, MBA, MPA and MS Business Analytics programs in the College of Business, 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**Grading Option:** Graded

FINA 802 Fixed Income Analysis

Prerequisites: Admission to MS Finance, MBA, MPA and MS Business Analytics programs in the College of Business, 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

Grading Option: Graded

FINA 803 Case Studies in Financial Management

Prerequisites: Admission to MS Finance, MBA, MPA and MS Business Analytics programs in the College of Business, 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

Grading Option: Graded

FINA 804 Portfolio Management II & Ethics

Prerequisites: FINA 863

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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 exposures, 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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**FINA 907 Insurance Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**FINA 965 Seminar in Banking****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**FINA 966 Seminar in Investments****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**FINA 968 Seminar in Finance****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**FINA 969 Finance Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

Food Science and Technology (FDST)

FDST 801 Teaching Applications of Food Science**Crosslisted with:** FDST 401**Prerequisites:** BIOS 101 and CHEM 109A and 109L**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

FDST 805 Food Microbiology**Crosslisted with:** BIOS 445, BIOS 845, FDST 405**Prerequisites:** BIOS 312**Notes:** BIOC 401 or BIOC 431 recommended**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Prerequisite for:** BIOS 446, BIOS 846, FDST 406, FDST 806; FDST 424, FDST 824; FDST 425, FDST 825; FDST 455, FDST 855, MBIO 455; FDST 455L, FDST 855L, MBIO 455L; FDST 460, FDST 860; FDST 867; 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**FDST 813 Baking Technology****Crosslisted with:** FDST 413**Prerequisites:** FDST 205**Description:** Chemistry and technology of bakery products, including formulation, ingredient functionality, processing, and quality evaluation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**FDST 814 Egg Processing from Science to Technology****Crosslisted with:** FDST 414**Prerequisites:** FDST 205**Description:** Chemistry and chemical composition of an egg. Principles, equipment, and quality assessment of egg processing and preservation operations. Nutritional role, bioactive components, and value added utilization of egg and egg products.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**FDST 815 Molds and Mycotoxins in Food, Feed, and the Human Environment****Crosslisted with:** FDST 415**Prerequisites:** Junior or Senior standing, 3 hours BIOS or LIFE**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Graded**Offered:** SPRING

FDST 824 Food Safety Microbiology**Crosslisted with:** FDST 424**Prerequisites:** FDST 405**Description:** Microbiological sampling, testing, and foodborne pathogen detection tools to support current food safety and sanitation regulatory requirements and the design and implementation of food safety management systems.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**FDST 825 Food Toxicology****Crosslisted with:** FDST 425**Prerequisites:** FDST 405/805, BIOC 401, 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**Grading Option:** Grade Pass/No Pass Option**FDST 829 Dairy Products Technology****Crosslisted with:** FDST 429**Prerequisites:** FDST 205**Notes:** Offered spring semester of odd-numbered calendar years.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**FDST 842 My Gut, My Health, My Food****Crosslisted with:** FDST 442**Prerequisites:** Junior or Senior standing**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**Grading Option:** Graded**Offered:** SPRING**FDST 848 Food Chemistry****Crosslisted with:** FDST 448**Prerequisites:** FDST 205; CHEM 251; BIOC 401.**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**Grading Option:** Grade Pass/No Pass Option**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 401.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** FDST 458, FDST 858**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded

FDST 855 Microbiology of Fermented Foods**Crosslisted with:** FDST 455, MBIO 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**FDST 855L Microbiology of Fermented Foods Laboratory****Crosslisted with:** FDST 455L, MBIO 455L**Prerequisites:** FDST 405/805 and parallel FDST 455/855/MBIO 455**Description:** Experiments involving the microorganisms and fermentation of foods and beverages.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**FDST 860 Food Product Development Concepts I****Crosslisted with:** FDST 460**Prerequisites:** FDST 405/805 and FDST 448/848.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**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**Grading Option:** Grade Pass/No Pass Option**FDST 866 Scientific Method in Practice****Notes:** The course is pass/no pass.**Description:** Introduction to the concepts of scientific inquiry (the scientific method, logical fallacies, publication, scientific ethics). Practical aspects of the modern research environment (academic and non-academic career paths), scientific communication and intellectual property.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**Offered:** SUMMER**FDST 867 Computational Genomics for Food and Nutritional Sciences****Prerequisites:** FDST 805 or BIOC 801**Notes:** Prerequisite can also be any coursework in Microbiology and Biochemistry or by permission**Description:** Metagenome taxonomic and functional profiling, protein functional annotation, pangenome analysis, genomic context-based genome mining, benchmark evaluation of bioinformatics tools, microbiome produced metabolites, metabolic enzymes of dietary fibers, polyphenols, and proteins**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**FDST 870 Nutraceuticals and Functional Foods****Crosslisted with:** FDST 470**Prerequisites:** BIOC 401 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**FDST 880A Food Carbohydrates****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**FDST 880P Food Proteins****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**FDST 892 Special Topics in Food Science and Technology****Crosslisted with:** FDST 492**Prerequisites:** FDST 205 or BIOS 312 or CHEM 251 or CHEM 253 or junior standing or higher**Description:** Special topics that address current and emerging issues in food science and technology.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**FDST 895 Graduate Internship Experience****Description:** Professional experience in a food science and technology area. Experience may be with a business, government agency, organization, or a university research, extension, or teaching program.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Grading Option:** Pass No-Pass

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**Grading Option:** Pass No-Pass**FDST 897 MS Project****Prerequisites:** Admission to masters degree program**Description:** Applied food science and technology experience to design, develop and complete a project to apply knowledge gained from course work to create an original body of work focusing on an area of personal or professional interest.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**FDST 908E Readings in Food Microbiology****Prerequisites:** FDST 805**Description:** Primarily a literature course focusing on current and emerging topics in food microbiology. Relevant articles from basic and applied microbiology journals reviewed and discussed. Emphasis on foodborne pathogen detection, testing, characterization, control, and epidemiology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**FDST 952 Professional Food Science Communication****Description:** Best practices for science communication through practical delivery of food science and technology knowledge to a variety of audiences.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 12**Grading Option:** Graded**Offered:** SPRING**FDST 993 Professional Development Workshop****Description:** Special workshops that address current and emerging skills in food science and technology. Include description specific to the workshop.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

FORS 815 Forensic Toxicology

Crosslisted with: FORS 415

Prerequisites: CHEM 252/254; BIOC 401 (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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

FORS 845 Human Remains in Forensic Science

Crosslisted with: FORS 445

Prerequisites: LIFE 120/L and LIFE 121/L, CHEM 109A/L, CHEM 110A/L, and FORS 120/L.

Description: Forensic anthropology within the broader context of forensic sciences and biological anthropology. Estimation of biological profile and trauma assessment.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$90

FORS 846 Pollen Analysis for Behavioral, Biological and Forensic Science

Crosslisted with: FORS 446, NRES 446, NRES 846

Prerequisites: 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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$90

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

Grading Option: Grade Pass/No Pass Option

French (FREN)

FREN 803 Advanced Grammar

Crosslisted with: FREN 403

Prerequisites: FREN 303 or 304; an additional 3 hours from FREN 301, 302, 303, or FREN 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

Grading Option: Grade Pass/No Pass Option

FREN 804 French Stylistics

Crosslisted with: FREN 404

Prerequisites: FREN 303 or 304; an additional 3 hours from FREN 301, 302, 303, or 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

Grading Option: Grade Pass/No Pass Option

FREN 806 Translation**Crosslisted with:** FREN 406**Prerequisites:** FREN 303 or 304; an additional 3 hours from FREN 301, 302, 303, or FREN 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**FREN 845 Topics in Medieval and Early Modern French Writing****Crosslisted with:** FREN 445**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** Readings and discussion on a topic, genre, author, and/or geographical area of the French-speaking world from the medieval period to the seventeenth century**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 853 Topics in Nineteenth Century French Culture and Writing****Crosslisted with:** FREN 453**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** Readings in the major cultural, historical and literary developments from 1789 to 1914**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 857 Modern French Writing****Crosslisted with:** FREN 457**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** Main trends in French writing from 1900 to the present.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 860 Literatures of French Expression****Crosslisted with:** FREN 460**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** Survey of writing and film from French-speaking cultures of Africa, the Caribbean, Oceania, Canada, and the Indian Ocean.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 861 Cultural Productions of the French-Speaking World****Crosslisted with:** FREN 461**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** A topic, genre, author, or geographical area of the French-speaking world.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 882 Short Fiction****Crosslisted with:** FREN 482**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** A survey of short fiction, including topics from the medieval period to the present. Theme and scope of readings will vary based on instructor.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 883 French/Francophone Theater****Crosslisted with:** FREN 483**Prerequisites:** FREN 301 or FREN 302; an additional 3 hours from FREN 301, FREN 302, FREN 303 or FREN 304**Description:** Examines the theatre of French expression from the Middle Ages to the present in France and the French-speaking world. Thematic approaches, authors, and plays examined will vary depending on the instructor.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**FREN 885 Writing the Self: Autofiction in/and the French-Speaking World****Crosslisted with:** FREN 485**Prerequisites:** FREN 301 or 302; an additional 3 hours from FREN 301, FREN 302, FREN 303, FREN 304**Description:** An exploration of the various modes, techniques, and impacts of auto-fictional writing in the French-speaking world. Includes a strong creative writing component.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 886 French and Francophone Women Writers****Crosslisted with:** FREN 486**Prerequisites:** FREN 301 or 302; an additional 3 hours from FREN 301, FREN 302, FREN 303, FREN 304**Description:** Considers women writers in the French-speaking world from the medieval period to the present. Addresses questions of gender, sexuality, theory via writings, film, and song.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

FREN 891 Special Topics in French**Crosslisted with:** FREN 491**Description:** Language, literature, and civilization.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**FREN 925 Drama****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 927 Novel****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 928 Poetry****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**FREN 929 Special Topics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Geography (GEOG)

GEOG 803 Environmental Justice

Crosslisted with: GEOG 403

Description: Exploration of the concept of environmental justice, which describes how the impacts of the natural and built environment differ according to race, ethnicity, and economic status. Topics include the development of movement from its early concerns with the location of waste facilities, to disparities in health outcomes, access to affordable and healthy food, and climate change issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Groups: CAS Diversity in the US

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

Grading Option: Grade Pass/No Pass Option

GEOG 808 Microclimate: The Biological Environment

Crosslisted with: PLAS 408, GEOG 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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: BSEN 954, NRES 954

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GEOG 422, GEOG 822; GEOG 922, NRES 922

Course and Laboratory Fee: \$50

GEOG 814 Spatial Analysis and Modeling

Crosslisted with: GEOG 414

Prerequisites: GEOG 412 and STAT 218 or STAT 380

Description: Advanced spatial analysis techniques, algorithms, and methods used in solving geographic problems. Topics include: cluster analysis, spatial autocorrelation, spatial regression, spatial sampling, and gravity models.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$15

GEOG 817 Web GIS

Crosslisted with: GEOG 417

Prerequisites: GEOG 317 or GEOG 412

Description: Introduction to Internet-based GIS and web cartography. Focus on programming concepts underlying the creation and implementation of quality web mapping applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Prerequisite for: GEOG 483, GEOG 883

GEOG 818 Introduction to Remote Sensing

Crosslisted with: GEOG 418, NRES 418, NRES 818

Prerequisites: Junior Standing

Description: Remote sensing of the earth from aerial and satellite platforms. Aerial photography, multispectral scanning, thermal imaging, microwave remote sensing techniques. Data acquisition and image analysis. Physical foundations of remote sensing using electromagnetic energy and energy-matter interactions. Applications in geographic, agricultural, environmental and natural resources analyses.

Credit Hours: 4

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Prerequisite for: GEOG 420, GEOG 820; GEOG 421, GEOG 821, NRES 421, NRES 821

Course and Laboratory Fee: \$115

GEOG 819 Applications of Remote Sensing in Agriculture and Natural Resources

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$35

GEOG 820 Digital Image Analysis of Remote Sensing Data

Crosslisted with: GEOG 420

Prerequisites: GEOG 418/818 or GEOG 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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$30

GEOG 821 Field Techniques in Remote Sensing

Crosslisted with: GEOG 421, NRES 421, NRES 821

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$65

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GEOG 922, NRES 922

Course and Laboratory Fee: \$50

GEOG 825 Geovisualization

Crosslisted with: GEOG 425

Prerequisites: GEOG 217

Description: Geovisualization encompasses the techniques and concepts that underlie digital cartography and the broader field of spatial visualization, exploring 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: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$65

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

Grading Option: Grade Pass/No Pass Option

GEOG 832 Programming, Scripting, and Automation for GIS

Crosslisted with: GEOG 432, NRES 432

Prerequisites: GEOG 217

Notes: Practical experience or other formal preparation in GIS may be substituted for prerequisite by permission.

Description: GIS-focused programming, scripting, and spatial analysis using the Python and R programming languages. Topics include: the ArcPy library, algorithm development, open source geospatial libraries, and the manipulation and analysis of geospatial data.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Course and Laboratory Fee: \$50

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**Grading Option:** Grade Pass/No Pass Option**GEOG 841 Geographies of Health****Crosslisted with:** GEOG 441

Description: Exploration of political economies of health care, the geographic distribution of services, the impacts of location in both care utilization and access, emphasizing the importance of "place" in health outcomes.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$45**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**Grading Option:** Grade Pass/No Pass Option**GEOG 850 Climate and Society****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**GEOG 867 Great Plains Field Pedology****Crosslisted with:** PLAS 477, GEOG 467, NRES 477, SOIL 477, NRES 877**Prerequisites:** PLAS/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**Grading Option:** Grade Pass/No Pass Option**GEOG 869 Bio-Atmospheric Instrumentation****Crosslisted with:** GEOG 469, PLAS 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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**GEOG 884 Water Resources Seminar****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**GEOG 891 Special Topics in Geography****Crosslisted with:** GEOG 491, NRES 491**Description:** Topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**GEOG 897 Geography Field Tour****Crosslisted with:** GEOG 497**Prerequisites:** Permission.**Description:** Applying geographic concepts with field training.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**GEOG 898 Research****Crosslisted with:** GEOG 498**Prerequisites:** Permission.**Description:** Research experience.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GEOG 902 General Seminar****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GEOG 940 Seminar in Human Geography****Description:** Discussion of current literature and research on selected aspects of human geography.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Geology (GEOL)

GEOL 812 Volcanology and Igneous Petrology**Crosslisted with:** GEOL 412**Prerequisites:** GEOL 201; and either CHEM 109A and 109L or CHEM 113A and 113L**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35**GEOL 815 Geochemical Thermodynamics****Crosslisted with:** GEOL 415**Prerequisites:** MATH 107, GEOL 201**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GEOL 818 Chemistry of Natural Waters****Crosslisted with:** GEOL 418, NRES 419, NRES 819, WATS 418**Prerequisites:** CHEM 109A/L and CHEM 110A/L, CHEM 113A/L and CHEM 114.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** GEOL 418L, GEOL 818L, NRES 419L, NRES 819L, WATS 418L**Course and Laboratory Fee:** \$25**GEOL 818L Chemistry of Natural Waters Laboratory****Crosslisted with:** GEOL 418L, NRES 419L, NRES 819L, WATS 418L**Prerequisites:** CHEM 109A and 109L and CHEM 110A and 110L or CHEM 113A and 113L and CHEM 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**Grading Option:** Grade Pass/No Pass Option**GEOL 819 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35

GEOL 821 Carbonate Petrology**Crosslisted with:** GEOL 421**Prerequisites:** GEOL 301.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**GEOL 824 Biogeochemical Cycles****Crosslisted with:** BIOS 424, BIOS 824, GEOL 424**Prerequisites:** CHEM 109A and 109L or CHEM 113A and 113L; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GEOL 830 Quantitative Methods in Paleontology****Crosslisted with:** GEOL 430**Prerequisites:** GEOL 301.**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**Grading Option:** Grade Pass/No Pass Option**GEOL 831 Micro-paleontology****Crosslisted with:** GEOL 431**Prerequisites:** At least one of GEOL 103, GEOL 105, or LIFE 121.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**GEOL 841 Geophysics****Crosslisted with:** GEOL 441**Prerequisites:** PHYS 142 or PHYS 212**Description:** Geophysical techniques to study the Earth: seismology, gravity, magnetics and heat flow.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**GEOL 844 Earth and Environmental Microbiology****Crosslisted with:** BIOS 444, BIOS 844, GEOL 444**Prerequisites:** 3 hours of BIOS or 3 hours of LIFE; 3 hours of CHEM**Description:** An introduction into the role that microorganisms play and have played in natural and man-made environments. Topics covered include microbial diversity and physiology in soil, sediment, and water; microbes in Earth history; biogeochemical cycling; mineral formation and dissolution; biodegradation and bioremediation; biotechnology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GEOL 845 Advanced Geophysics****Crosslisted with:** GEOL 445**Prerequisites:** GEOL 441**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**Grading Option:** Grade Pass/No Pass Option**GEOL 846 Exploration Geophysics****Crosslisted with:** GEOL 446**Prerequisites:** GEOL 485**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**GEOL 850 Surficial Processes and Landscape Evolution****Crosslisted with:** GEOL 450**Prerequisites:** GEOL 301.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** GEOL 465, GEOL 865, NRES 465, NRES 865**Course and Laboratory Fee:** \$35**GEOL 851 Invertebrate Paleobiology****Crosslisted with:** GEOL 451, BIOS 451, BIOS 851**Prerequisites:** At least one of: GEOL 103, GEOL 105, LIFE 121**Description:** Overview of the key traits, relationships and evolutionary dynamics of invertebrate animals over Earth's history, particularly over the Phanerozoic (i.e., the last 540 million years). Emphasis on the use of invertebrate fossil record to test ideas about long term evolutionary patterns as well as learning the histories and basic anatomies of major invertebrate taxa.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**GEOL 853 GIS in Earth and Atmospheric Sciences****Crosslisted with:** GEOL 453, METR 453, METR 853**Prerequisites:** Junior or above standing; and one of the following: GEOL 100 or 101, or METR 100**Description:** Basic concepts of GIS, hands-on experience with various case studies from geology, meteorology, climatology and environmental applications.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**GEOL 857 Ecosystem Ecology****Crosslisted with:** BIOS 457, BIOS 857, GEOL 457**Prerequisites:** BIOS 207 and CHEM 110A and 110L 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BSEN 954, NRES 954

GEOL 861 Soil Physics

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

Prerequisites: PLAS/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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$15

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

Grading Option: Grade Pass/No Pass Option

GEOL 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

GEOL 880 Economic Geology of the Metals

Crosslisted with: GEOL 480

Prerequisites: GEOL 400; CHEM 114, CHEM 221A & CHEM 221L.

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

GEOL 884 Water Resources Seminar

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

GEOL 885 Fossil Fuel Geology and Exploration

Crosslisted with: GEOL 485

Prerequisites: GEOL 301.

Description: Geology of coal, oil and gas, and methods of exploration.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$35

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GEOL 470, GEOL 870; GEOL 986; NRES 918

Course and Laboratory Fee: \$10

GEOL 891 Special Topics in Geology

Crosslisted with: GEOL 491

Description: Topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

GEOL 897 Economic and Exploration Geology**Crosslisted with:** GEOL 497**Prerequisites:** GEOL 301.**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:** 6**Grading Option:** Grade Pass/No Pass Option**GEOL 925 Seminar in Sedimentology****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$70**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GEOL 939 Seminar in Paleontology****Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**GEOL 940 Advanced Structural Geology****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$70**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**GEOL 947 Seminar in Geophysics****Notes:** Can be taken for 1 (no grade, pass/no pass) or for 2 credit hours (grade will be assigned).**Description:** Review and discussion of professional research papers in Geophysics.**Credit Hours:** 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

German (GERM)

GERM 803 Advanced Syntax and Stylistics in German

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

Grading Option: Grade Pass/No Pass Option

GERM 804 Advanced Grammar and Composition in German

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 grammar study and its practical applications to writing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GERM 810

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GERM 929

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERM 891 Special Topics in German****Crosslisted with:** GERM 491**Description:** Language, literature, and civilization.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERM 922C The Interpretive Mode: Reading and Listening in the German Language Classroom****Crosslisted with:** TEAC 922C**Prerequisites:** Substantial content knowledge in German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching reading, listening and viewing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

GERM 922E Teaching for Intercultural Communicative Competence in the German Language Classroom**Crosslisted with:** TEAC 922E**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching culture and intercultural communicative competence in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 922G Interpersonal and Presentational Writing in the German Language Classroom****Crosslisted with:** TEAC 922G**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching writing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 922L Interpersonal and Presentational Speaking in the German Language Classroom****Crosslisted with:** TEAC 922L**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching both interpersonal and presentational speaking with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 922P Assessment in the German Language Classroom****Crosslisted with:** TEAC 922P**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores the fundamental concepts and principles of assessment in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 922T Planning in the German Language Classroom****Crosslisted with:** TEAC 922T**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of instructional planning strategies for the purposes of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 922X Technology-Enhanced German Language Instruction****Crosslisted with:** TEAC 922X**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of technology tools for foreign language with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERM 930 Seminar in German Linguistics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**GERM 950 German Graduate Reading Colloquium****Description:** Readings and discussion of German literature and media from across periods and genres.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Gerontology (GERO)

GERO 810 Educational Gerontology**Crosslisted with:** GERO 410**Prerequisites:** Junior, Senior & Graduate students only**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**Grading Option:** Graded**Offered:** SPRING**GERO 835 Issues in Aging****Crosslisted with:** GERO 435**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERO 869 Working with Minority Elderly****Crosslisted with:** GERO 469**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERO 873 Dying, Death and Grieving****Prerequisites:** Graduate Student**Description:** An examination of theory and research relevant to interaction with the older, terminally ill person, focusing on communication with widows and other survivors as well as the dying patient.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GERO 885 Hospice and Other Services for the Dying Patient/Family****Crosslisted with:** GERO 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**Grading Option:** Grade Pass/No Pass Option

GERO 889 Palliative Care: Mentoring a Healthcare Approach of Patient-Centered Care with Focus on Well-Being**Crosslisted with:** GERO 489**Prerequisites:** Jr or Sr standing

Description: Provides a foundation for the recognition of the need to implement palliative medical care. Using current texts and literature, video and podcast lectures by colleagues, and review of case and topics, study the definitions, purposes, and benefits of palliative medical care. Learn the avenues and ways to implement palliative care to provide care that promotes well-being.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Graduate Business Administration (GRBA)

GRBA 98 MBA Assessment**Credit Hours:** 0**Max credits per semester:****Max credits per degree:****Grading Option:** Pass No-Pass**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:****Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**GRBA 808 Introduction to Business Strategy****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**Grading Option:** Graded**Prerequisite for:** MNGT 985**GRBA 809 Financial Accounting****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**Grading Option:** Graded**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**Grading Option:** Graded**GRBA 811 Managerial Finance****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**Grading Option:** Graded**Prerequisite for:** FINA 850; FINA 862; FINA 863

GRBA 812 Managerial Economics

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

Grading Option: Graded

GRBA 813 Managerial Marketing

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

Grading Option: Graded

Prerequisite for: ABUS 855, MRKT 855; MRKT 821; MRKT 830; MRKT 835; MRKT 898

GRBA 814 Applied Organizational Behavior

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

Grading Option: Graded

GRBA 815 Supply Chain Management Strategies

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

Grading Option: Graded

Prerequisite for: SCMA 832; SCMA 833; SCMA 834; SCMA 839; SCMA 844

GRBA 816 Strategic Human Resource Management

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

Grading Option: Graded

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

Grading Option: Graded

GRBA 851 Business Analytics

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

Grading Option: Graded

Prerequisite for: MRKT 845; SCMA 851; SCMA 852; SCMA 853; SCMA 855

GRBA 852 International Business

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

Grading Option: Graded

GRBA 853 Strategic Management and Business Policy

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

Grading Option: Graded

Prerequisite for: MNGT 985

GRBA 860 Management: Theory, Issues and Practice

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

Grading Option: Graded

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: 0-6

Min credits per semester:

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

GRBA 898 Managerial Skills Seminar

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: 0-3

Min credits per semester:

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Graded

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:

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

Prerequisite for: GRDC 900B; GRDC 900D

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

Grading Option: Pass No-Pass

Prerequisite for: GRDC 900D

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

Grading Option: Pass No-Pass

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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

Great Plains Study Program (GPSP)

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**Grading Option:** Graded

Greek (GREK)

GREK 891 Special Topics in Greek Prose**Crosslisted with:** GREK 491**Description:** Readings from Greek prose masterpieces, topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**GREK 892 Special Topics in Greek Poetry****Crosslisted with:** GREK 492**Description:** Readings from Greek verse masterpieces, topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option

History (HIST)

HIST 801A Career Diversity in History & the Humanities

Prerequisites: Graduate Standing

Description: Explore career diversity options for humanities and social sciences. Assemble application materials. Build professional networks. Practice interview skills.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No-Pass

Offered: FALL

HIST 801B Leadership & Development in the Humanities & Social Sciences

Prerequisites: Graduate Standing

Description: Develop inclusive leadership models. Apply leadership principles. Build professional networks. Apply foundational development skills such as fundraising and grant writing.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No-Pass

Offered: SPRING

HIST 801C Research Communication & Funding for Humanists

Prerequisites: Graduate Standing

Notes: PhD History students will register for this class in Fall and Spring of their 2d year.

Description: Develop research communication and grant writing skills.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 2

Grading Option: Pass No-Pass

Offered: FALL/SPR

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

Grading Option: Grade Pass/No Pass Option

Groups: CAS Diversity in the US

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HIST 818 Augustan Rome****Crosslisted with:** HIST 418, CLAS 418**Prerequisites:** Sophomore standing.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HIST 857 19th Century United States Economic History****Crosslisted with:** ECON 457, ECON 857, HIST 457**Prerequisites:** ECON 210, or both ECON 211 and ECON 212.**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$50

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

Grading Option: Grade Pass/No Pass Option

HIST 863 Indigenous Peoples of Latin America

Crosslisted with: HIST 463, ETHN 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

HIST 878 Pro-seminar in Latin American Studies**Crosslisted with:** HIST 478, POLS 478, EDPS 478, POLS 878, EDPS 878**Prerequisites:** Junior standing and permission.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**HIST 879 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, POLS 866, AECN 467, ECON 866, HIST 479**Prerequisites:** Senior standing and permission.**Notes:** Open to students with an interest in international relations.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HIST 889 Histories of Inclusion & Exclusion in US Education****Crosslisted with:** HIST 489, ETHN 489, ETHN 889**Prerequisites:** Junior or Senior Standing**Description:** Examination of the history of education in the United States from the colonial era to the present. Focus on shifts in formal educational policy and the influence of those policies on diverse demographic groups. Themes include the emergence of a public and private school systems, the spread of segregated schools, the development of curricular standards, the history of teachers, the push for desegregation, as well as debates over students' rights, language, affirmative action, and the public/private nature of charter schools, especially in terms of social justice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SUMMER**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HIST 901 Historical Theory & Debate****Prerequisites:** Graduate Standing**Description:** Examination of the transformation of the field of history in the past two centuries. Topics include 19th century philosophical foundations, historiography, contemporary historical practices, and how theoretical approaches enhance our understanding of history.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HIST 941 Overview of American History****Description:** Overview of American history from colonial to present period.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**HIST 943 Readings and Problems in American History since 1877****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**HIST 953 Comparative Topics and Approaches in History****Notes:** Letter grade only.**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.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**HIST 961 Overview of World History****Description:** Overview of 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**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**HIST 970 Seminar in Digital History****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PLPT 866; 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PLPT 866; PLPT 965, AGRO 965, HORT 965**HORT 803 Scientific Writing and Communication****Crosslisted with:** PLAS 403, AGRO 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**Grading Option:** Graded

HORT 806 Plant Ecophysiology: Theory and Practice**Crosslisted with:** AGRO 806, NRES 406, NRES 806, PLAS 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**Grading Option:** Grade Pass/No Pass Option**HORT 807 Bio-Atmospheric Instrumentation****Crosslisted with:** GEOG 469, PLAS 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**Grading Option:** Grade Pass/No Pass Option**HORT 808 Microclimate: The Biological Environment****Crosslisted with:** PLAS 408, GEOG 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BSEN 954, NRES 954**HORT 809A Case studies in plant breeding: Breeding for Disease Resistance****Crosslisted with:** PLAS 409A, AGRO 809A**Notes:** A previous class in genetics is highly recommended.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**HORT 809B Case Studies in plant breeding: Transgenic strategies for disease resistance****Crosslisted with:** PLAS 409B, AGRO 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**HORT 814 Turfgrass Disease Management****Crosslisted with:** AGRO 814, PLPT 414, PLPT 814, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HORT 818 Agroforestry Systems in Sustainable Agriculture****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HORT 826 Invasive Plants****Crosslisted with:** PLAS 426, AGRO 826, NRES 426, NRES 826**Prerequisites:** PLAS/SOIL 153; PLAS 131**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**HORT 827 Turfgrass Systems Management****Crosslisted with:** PLAS 427, AGRO 827, TLMT 827**Prerequisites:** PLAS 227 and PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**HORT 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, ANTH 829A, PLAS 429A, AGRO 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HORT 833 Permaculture: Sustainable Living****Crosslisted with:** PLAS 433**Notes:** This is a Great Plains IDEA course. Restricted to upper level undergraduate, graduate, or matriculated continuing education students.**Description:** Permaculture means "permanent culture," and "...is the conscious design and maintenance of cultivated ecosystems that have the diversity, stability, and resilience of a natural ecosystem." [Bill Mollison] This course will explore a design/thinking methodology that seeks to provide our essential physical needs, food, water, shelter, energy, etc., while doing so in an environmentally friendly, sustainable manner.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**HORT 836 Agroecosystems Analysis****Crosslisted with:** PLAS 436, AGRO 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**Grading Option:** Grade Pass/No Pass Option**HORT 839 Organic Farming and Food Systems****Crosslisted with:** AGRO 839, PLAS 439**Prerequisites:** 12 credits of agricultural or biological science, economics, or natural resources**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**HORT 841 Perennial Plant Function, Growth, and Development****Crosslisted with:** PLAS 441, AGRO 841, RNGE 441, GRAS 441**Prerequisites:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**HORT 862 Cannabis Growth, Production and Breeding Basics****Crosslisted with:** PLAS 462, AGRO 862**Prerequisites:** PLAS 131 or LIFE 121; PLAS 215 or BIOS 206**Notes:** PLAS 221 recommended**Description:** History, breeding and production of cannabis for medicinal marijuana and hemp for fiber use when grown using a growth room, greenhouse, high tunnel and/or field. Clarification between scientific evidence and casual information.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** FALL/SPR**HORT 871 Vines, Wines and You****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$95**HORT 878 Plant Anatomy****Crosslisted with:** BIOS 478, BIOS 878, PLAS 478, AGRO 878**Prerequisites:** 8 hrs biological sciences**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**Grading Option:** Grade Pass/No Pass Option**HORT 880 Modified Root Zones****Crosslisted with:** PLAS 480, TLMT 880, AGRO 880**Prerequisites:** PLAS 153/SOIL 153**Notes:** Recommend CHEM 105A/CHEM 105L or CHEM 109A/CHEM 109L, PLAS 131, PLAS 227, and PLAS 453 or PLAS 472**Description:** Modified root zones 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**HORT 888 Entrepreneurship and Enterprise Development****Crosslisted with:** PLAS 488, EAEP 488, ENTR 488, EAEP 888, AGRO 888, ENTR 888, ABUS 488**Description:** The process of starting your own enterprise. Competitive environment, risk management, finance for business startups, funding, and business plan writing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**HORT 889 Urbanization of Rural Landscapes****Crosslisted with:** PLAS 489, AGRO 889, CRPL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

HORT 897 Master of Applied Science Project**Crosslisted with:** AGRI 897, AGRO 897, NRES 897, ASCI 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**HORT 919 Advanced Crop Genetics and Genomics****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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

HORT 999 Doctoral Dissertation**Crosslisted with:** AGRO 999**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair.**Notes:** AGRO 999 is pass/no pass only.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Grading Option:** Pass No-Pass

Hospitality, Restaurant and Tourism Management (HRTM)

HRTM 871 Vines, Wines and You**Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$95**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**Grading Option:** Graded**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**Grading Option:** Graded**HRTM 876 Internship in Hospitality Management****Crosslisted with:** HRTM 476**Prerequisites:** HRTM 397**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**Grading Option:** Graded**Experiential Learning:** Internship**HRTM 880 Advanced Tourism****Crosslisted with:** HRTM 480**Prerequisites:** HRTM 280**Description:** Introduction to the integrated and sustainable development approach in tourism. Explore the background of and approaches to tourism planning, historical and contemporary development of tourism, as well as the concepts and components of the planning process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**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**Grading Option:** Graded**HRTM 883 Hospitality Financial Management****Crosslisted with:** HRTM 483**Prerequisites:** ACCT 200 or 201, Junior Standing; HRTM major**Notes:** Letter grade only.**Description:** Financial management in a hospitality industry setting.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**HRTM 889 Advanced Event Operations****Crosslisted with:** HRTM 489**Prerequisites:** HRTM Major/Minor, HRTM 289, junior standing, HRTM 397**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**Experiential Learning:** Other**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**Grading Option:** Graded**HRTM 896 Independent Study****Crosslisted with:** HRTM 496**Prerequisites:** 12 hrs HRTM and Permission**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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option

Interior Design (IDES)

IDES 817 Product Design**Crosslisted with:** ARCH 417, ARCH 617, ARCH 817, IDES 417, LARC 417**Prerequisites:** Admission to a professional program in the College of Architecture.**Description:** Generate a design from conception to a finished product that emphasizes the awareness of the human and the environment in the creation of product design solutions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**IDES 855 Environmental Behavior & Social Factors in the Built Environment****Crosslisted with:** IDES 455**Description:** Introduction to the relationship between human behavior and the environment. Key areas of inquiry address a continuum of scale: person, home, building, community and city.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**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**Grading Option:** Graded**IDES 864 Suburbanism****Crosslisted with:** IDES 464**Notes:** Online seminar.**Description:** Engages in multi-faceted discourse on the built environment, development, and design of suburbia. Emphasis is placed on the role of design and its impact on the physical, social, political and economic structures of the suburbs and the single-family home. Examines multiple scales from various points of view.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SUMMER**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**IDES 887 Evidence Based Design****Crosslisted with:** IDES 487**Description:** An introduction to evidence based design as it applies to a variety of different building types. Overall exploration of research topics and issues related to key areas of inquiry include: workplace, healthcare, education, retail + brand, culture and sustainability. The design application of research findings related to each respective area is explored.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**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**Grading Option:** Graded**IDES 896 Problems in Interior Design****Crosslisted with:** IDES 496**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Offered:** FALL/SPR**JOMC 822 Race, Gender, and Media****Crosslisted with:** JOMC 422**Notes:** Open to non-College of Journalism and Mass Communications majors.**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.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded

JOMC 862 The Social Media Landscape**Crosslisted with:** JOMC 462**Description:** Examine the idea of social influence and how social media trends are changing the way information flows into our society. Through Socratic-based discussions discover the impact of social media on global political and social change movements.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**JOMC 887 Media, Ethics and Society****Crosslisted with:** JOMC 487**Prerequisites:** Junior standing; major in the College of Journalism and Mass Communications**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**Grading Option:** Graded**JOMC 891 Special Topics****Crosslisted with:** JOMC 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**Grading Option:** Graded**JOMC 892 Pop-Up Course****Crosslisted with:** JOMC 492**Description:** Topics vary every term.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass

Journalism (JOUR)

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**Grading Option:** Graded**JOUR 805 Solutions Journalism****Notes:** An eight-week online course.**Description:** Explores the concept and practice of solutions journalism, an emerging journalism model. Learning about the origins of this model, the reporting and writing strategies necessary to achieve it and its impact.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**JOUR 807 Data Visualization****Crosslisted with:** JOUR 407**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**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**Grading Option:** Graded

JOUR 814 Government Controls of Information**Crosslisted with:** JOUR 414**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; junior standing**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**Grading Option:** Graded**JOUR 820 News Engagement****Description:** How to engage today's distracted readers and viewers and connect with communities to provide important news and information. Study the engagement practices of U.S. news organizations and learn how they connect with digital audiences across platforms.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**JOUR 890A Global Eyewitness Multimedia Photojournalism Project****Crosslisted with:** JOUR 490A**Prerequisites:** JOMC 101, JOMC 130-134, JOUR 200A with a C or higher; ADPR 151, ADPR 221, ADPR 283 or BRDC 227, BRDC 269, BRDC 260 or SPMC 150, 250 or JOUR 200B with a C or higher; JOMC 206; junior standing**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:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Graded**Offered:** FALL/SPR**Prerequisite for:** JOUR 490B, JOUR 890B**JOUR 890B Global Eyewitness Multimedia Photojournalism Editing****Crosslisted with:** JOUR 490B**Prerequisites:** JOUR 490A/890A**Description:** Editing multimedia stories based on previous semester's JOUR 490A/890A Global Eyewitness trip.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Graded

Journalism - Graduate (JGRD)

JGRD 809 Theories of Freedom of Expression**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**JGRD 850 Data Storytelling****Description:** Every day, more of our lives are being stored in a database somewhere. With that explosion of data, storytellers now more than ever need the skills to analyze and understand data to then produce the stories hidden in the information. We'll use brainpower and software to look at raw data –not summarized and already reported information –to reveal insights and build strong stories. Coding in R and basic statistical techniques and tools from the storyteller's toolkit such as characters and narrative will be included.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** JGRD 851**JGRD 851 Data Visualization****Prerequisites:** JGRD 850 Data Storytelling**Description:** While creating publishable graphics was once the realm of a designated department, there is now an expectation across all media sectors that journalists and communications professionals be able to visualize data to gain insight, share information and enhance publications. Teaches the tools to make powerful visualizations with code using the ggplot2 library in R. This library is used by news outlets like the BBC, FiveThirtyEight, the New York Times and ProPublica. It is also widely used in scientific and social science circles because it allows for striking graphics with a high degree of customization. Of course, with great power comes great responsibility, so course readings focus on visualizing ethically.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**JGRD 954 MASS MEDIA & GOVT****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

Landscape Architecture (LARC)

LARC 592 Selected Topics in Landscape Architecture

Crosslisted with: LARC 392, LARC 492

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: 12

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

Grading Option: Grade Pass/No Pass Option

LATN 891 Special Topics in Latin Prose

Crosslisted with: LATN 491

Description: Readings from Latin prose masterpieces, topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

LATN 892 Special Topics in Latin Poetry

Crosslisted with: LATN 492

Description: Readings from Latin verse masterpieces, topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

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: 5

Max credits per semester: 5

Max credits per degree: 5

Grading Option: Law Grades

Offered: FALL

LAW 501G Contracts I

Crosslisted with: LAW 501

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: 5

Max credits per semester: 5

Max credits per degree: 5

Grading Option: Law (G) Classes

Offered: FALL

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 505 Property I****Crosslisted with:** LAW 505G

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: 5**Max credits per semester:** 5**Max credits per degree:** 5**Grading Option:** Law Grades**Offered:** SPRING**LAW 505G Property I****Crosslisted with:** LAW 505

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: 5**Max credits per semester:** 5**Max credits per degree:** 5**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 513 Legal Analysis, Writing and Research (LAWR)****Crosslisted with:** LAW 513G

Notes: Students must also take Law 514/G (3 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: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**Prerequisite for:** LAW 705, LAW 705G**LAW 513G Legal Analysis, Writing and Research (LAWR)****Crosslisted with:** LAW 513

Notes: Students must also take Law 514/G (3 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: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**Prerequisite for:** LAW 705, LAW 705G

LAW 514 Legal Analysis, Writing and Research (LAWR)**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING**Prerequisite for:** LAW 705, LAW 705G**LAW 514G Legal Analysis, Writing and Research (LAWR)****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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**Prerequisite for:** LAW 705, LAW 705G**LAW 516 Civil Procedure I****Crosslisted with:** LAW 516G**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:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law Grades**Prerequisite for:** LAW 729, LAW 729G**LAW 516G Civil Procedure I****Crosslisted with:** LAW 516**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:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law (G) Classes**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 574 International Law: Strategic Space Law & Policy****Crosslisted with:** LAW 574G**Description:** Examines the legal aspects of space security. Content ranges across the spectrum from peace to conflict and covers international law applicable to space situational awareness, sharing of technology, expertise and data, space launch, the space component of ballistic missile defense, space-based intelligence, surveillance and reconnaissance and means to counter these systems, space-based Position, Navigation and Timing (PNT), satellite communications, use of the radio-frequency spectrum and electronic warfare, counter-space operations and force application from space. Examines the application of the law of armed conflict to military activities in space. Demonstrate advanced knowledge of the intersection of law, strategy and outer space; critically analyze complex problems arising from the application of law to space security; and broadly understand the interests and stakeholders in a variety of contexts associated with strategic space law.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law Grades

LAW 574G International Law: Strategic Space Law & Policy**Crosslisted with:** LAW 574

Description: Examines the legal aspects of space security. Content ranges across the spectrum from peace to conflict and covers international law applicable to space situational awareness, sharing of technology, expertise and data, space launch, the space component of ballistic missile defense, space-based intelligence, surveillance and reconnaissance and means to counter these systems, space-based Position, Navigation and Timing (PNT), satellite communications, use of the radio-frequency spectrum and electronic warfare, counter-space operations and force application from space. Examines the application of the law of armed conflict to military activities in space. Demonstrate advanced knowledge of the intersection of law, strategy and outer space; critically analyze complex problems arising from the application of law to space security; and broadly understand the interests and stakeholders in a variety of contexts associated with strategic space law.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law (G) Classes**LAW 575 International Trade with China****Crosslisted with:** LAW 575G

Description: Over the past thirty years, no single factor has impacted global trade regulation more than the rise of China as the largest trading nation on Earth. The current focus on US-China trade relations cannot be fully understood without the context of the recent history of China international economic relations and development, China role at the WTO, China trade relations outside the US, and how the recent tensions came about. Finally, the class will attempt to answer the question on everyone mind, where will we go from here (and will we go together, or on separate paths)? This course is intended to provide students with a practical and case study-based overview of China role in global trade. The course is delivered via a blended learning approach, incorporating online teaching materials and modules.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Law Grades**LAW 575G International Trade with China****Crosslisted with:** LAW 575

Description: Over the past thirty years, no single factor has impacted global trade regulation more than the rise of China as the largest trading nation on Earth. The current focus on US-China trade relations cannot be fully understood without the context of the recent history of China international economic relations and development, China role at the WTO, China trade relations outside the US, and how the recent tensions came about. Finally, the class will attempt to answer the question on everyone mind, where will we go from here (and will we go together, or on separate paths)? This course is intended to provide students with a practical and case study-based overview of China role in global trade. The course is delivered via a blended learning approach, incorporating online teaching materials and modules.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Law (G) Classes**LAW 576 Principles of Federal Appropriations and Fiscal Law****Crosslisted with:** LAW 576G

Notes: Variable credit hours are stated so that different faculty can teach it in different ways. Credit hours offered will reflect the variance in expectations for those faculty. Law Grading is done on the curve.

Description: Provide foundational review of federal appropriation and fiscal law principles. Covers the statutory, regulatory, and policy governing the commitment, obligation, and expenditure of appropriated funds by federal agencies and employees.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 576G Principles of Federal Appropriations and Fiscal Law****Crosslisted with:** LAW 576

Notes: Variable credit hours are stated so that different faculty can teach it in different ways. Credit hours offered will reflect the variance in expectations for those faculty. Law Grading is done on the curve.

Description: Provide foundational review of federal appropriation and fiscal law principles. Covers the statutory, regulatory, and policy governing the commitment, obligation, and expenditure of appropriated funds by federal agencies and employees.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**LAW 577 International Trade: Agriculture, Food & Wine****Crosslisted with:** LAW 577G

Notes: The course is delivered through a blended learning incorporating online teaching materials and modules.

Description: Seeks to raise competence in international trade and economic development through an understanding of the role and impact of agriculture and food. Understanding agricultural policy models, the role of intergovernmental organizations, and the growing impact of new impediments to trade such as those manifested in private standards are all key to appreciating today's globalized market for agriculture and food. The food and agriculture area is one that has witnessed dramatic transformation in markets and methods in recent years with retailers gaining an ever greater influence over production and distribution decisions. This development has been concurrent with and in contrast to the growing efforts in Aid for Trade in agriculture, food production and food security when the world's population is approaching 9 billion. Finally, trade in wine presents a microcosm of trade topics, including agriculture, technical barriers to trade (TBT), sanitary and phytosanitary measures (SPS), intellectual property, national treatment, and cross cultural negotiations, against the backdrop of a comparatively small agricultural sector. Provide students with a practical and case study-based background in global trade in food and agricultural products.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades

LAW 577G International Trade: Agriculture, Food & Wine**Crosslisted with:** LAW 577**Notes:** The course is delivered through a blended learning incorporating online teaching materials and modules.

Description: Seeks to raise competence in international trade and economic development through an understanding of the role and impact of agriculture and food. Understanding agricultural policy models, the role of intergovernmental organizations, and the growing impact of new impediments to trade such as those manifested in private standards are all key to appreciating today's globalized market for agriculture and food. The food and agriculture area is one that has witnessed dramatic transformation in markets and methods in recent years with retailers gaining an ever greater influence over production and distribution decisions. This development has been concurrent with and in contrast to the growing efforts in Aid for Trade in agriculture, food production and food security when the world's population is approaching 9 billion. Finally, trade in wine presents a microcosm of trade topics, including agriculture, technical barriers to trade (TBT), sanitary and phytosanitary measures (SPS), intellectual property, national treatment, and cross cultural negotiations, against the backdrop of a comparatively small agricultural sector. Provide students with a practical and case study-based background in global trade in food and agricultural products.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**LAW 578 Patent Practice and Innovation Management****Crosslisted with:** LAW 578G

Notes: Not limited to patent-specific students; technical background is not required. Appropriate for students seeking careers in intellectual property, transactional, mergers/acquisitions, litigation, and business law as well as those seeking careers in business and technical fields. Open to law students, graduate-level engineering and science majors, MBA students, and graduate-level entrepreneur majors.

Description: Simulated skills-based course focused on the lifecycle of patent-protected innovation (i.e., pre-patent strategy, patent searching, patent preparation and prosecution, post allowance activities, and general portfolio management). Interact with real or simulated inventors and examiners. Provide an understanding of the nature and operation of patents, hands on experience with patent searching, drafting and prosecution, and an understanding of the strategic use of patents.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 578G Patent Practice and Innovation Management****Crosslisted with:** LAW 578

Notes: Not limited to patent-specific students; technical background is not required. Appropriate for students seeking careers in intellectual property, transactional, mergers/acquisitions, litigation, and business law as well as those seeking careers in business and technical fields. Open to law students, graduate-level engineering and science majors, MBA students, and graduate-level entrepreneur majors.

Description: Simulated skills-based course focused on the lifecycle of patent-protected innovation (i.e., pre-patent strategy, patent searching, patent preparation and prosecution, post allowance activities, and general portfolio management). Interact with real or simulated inventors and examiners. Provide an understanding of the nature and operation of patents, hands on experience with patent searching, drafting and prosecution, and an understanding of the strategic use of patents.

Credit Hours: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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: 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law Grades**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: 1-2**Min credits per semester:** 1**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**LAW 582 Cybersecurity and Sectoral Data Regulation****Crosslisted with:** LAW 582G**Prerequisites:** LAW 775 TECHNOLOGY LAW: CONCEPTS

Description: Introduction to various legal frameworks relating to data- and cybersecurity, such as data breach notification laws regulatory data security requirements such as contained in HIPPA and GLBA, and the patchwork of statute and common law tools available for addressing cybersecurity concerns. Prepares students to interact with professionals in other fields relevant to cybersecurity practice, and broader policy discussions about cybersecurity law and policy.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING**LAW 582G Cybersecurity and Sectoral Data Regulation****Crosslisted with:** LAW 582**Prerequisites:** LAW 775 TECHNOLOGY LAW: CONCEPTS

Description: Introduction to various legal frameworks relating to data- and cybersecurity, such as data breach notification laws regulatory data security requirements such as contained in HIPPA and GLBA, and the patchwork of statute and common law tools available for addressing cybersecurity concerns. Prepares students to interact with professionals in other fields relevant to cybersecurity practice, and broader policy discussions about cybersecurity law and policy.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**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**Grading Option:** Law Grades

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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**LAW 588 Family Mediation****Crosslisted with:** LAW 588G**Prerequisites:** LAW 710**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING**LAW 588G Family Mediation****Crosslisted with:** LAW 588**Prerequisites:** LAW 710**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**Offered:** SPRING**LAW 601 Privacy: Informational, Reputational, and Dignitary Harms****Crosslisted with:** LAW 601G**Prerequisites:** Law 775 Technology Law: Concepts

Description: Privacy law, already a field of longstanding attention, has grown significantly in importance in our modern information era. Introduction to the laws and regulations that govern information privacy in the United States and around the world and the struggles of protecting individual privacy in the modern era. Considers the Constitutional, common law, and statutory mechanisms that control access to and use of information about individuals; the broad and often conflicting definitions of and principles behind these mechanisms; from self-regulation to criminal law, from states and localities to international treaty. Evaluation by exam or other written assignments.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**LAW 601G Privacy: Informational, Reputational, and Dignitary Harms****Crosslisted with:** LAW 601**Prerequisites:** Law 775 Technology Law: Concepts

Description: Privacy law, already a field of longstanding attention, has grown significantly in importance in our modern information era. Introduction to the laws and regulations that govern information privacy in the United States and around the world and the struggles of protecting individual privacy in the modern era. Considers the Constitutional, common law, and statutory mechanisms that control access to and use of information about individuals; the broad and often conflicting definitions of and principles behind these mechanisms; from self-regulation to criminal law, from states and localities to international treaty. Evaluation by exam or other written assignments.

Credit Hours: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**Offered:** FALL**LAW 607 Teaching Assistant (TA)****Description:** Assisting Law professor as a TA**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Pass No-Pass**LAW 608 Semester Externship****Credit Hours:** 9-12**Min credits per semester:** 9**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Pass No-Pass**Offered:** FALL/SPR**LAW 609 Constitutional Law I****Crosslisted with:** LAW 609G**Description:** Focus primarily on structure - judicial power, legislative power; executive power, justiciability; federalism and state sovereignty; separation of powers. May include discussion of electoral federalism and the 17th Amendment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**Prerequisite for:** LAW 797, LAW 797G**LAW 609G Constitutional Law I****Crosslisted with:** LAW 609**Description:** Focus primarily on structure - judicial power, legislative power; executive power, justiciability; federalism and state sovereignty; separation of powers. May include discussion of electoral federalism and the 17th Amendment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**Prerequisite for:** LAW 797, LAW 797G**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 614 Election Law****Crosslisted with:** LAW 614G**Description:** Examines legal doctrine and policy as it relates to the democratic political process. Focuses on the text of the Constitution and of federal legislation that governs voting and the political process, the decisions of the United States Supreme Court interpreting the Constitution and federal statutes, and the federal regulations that impact our democracy. Topics will include: campaign finance, the Voting Rights Act, one person, one vote, racial and partisan gerrymandering, direct democracy, the regulation of political parties, and the Help America Vote Act. Develops an understanding of where the law of our democracy has been, where it is today, and where it might be headed. Grade based on exam.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 614G Election Law****Crosslisted with:** LAW 614**Description:** Examines legal doctrine and policy as it relates to the democratic political process. Focuses on the text of the Constitution and of federal legislation that governs voting and the political process, the decisions of the United States Supreme Court interpreting the Constitution and federal statutes, and the federal regulations that impact our democracy. Topics will include: campaign finance, the Voting Rights Act, one person, one vote, racial and partisan gerrymandering, direct democracy, the regulation of political parties, and the Help America Vote Act. Develops an understanding of where the law of our democracy has been, where it is today, and where it might be headed. Grade based on exam.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 620 Nonprofit Organizations****Crosslisted with:** LAW 620G**Prerequisites:** Pre- or Co-requisite - Law 632 Business Associations**Description:** Advanced course in business law, focusing on the law of not-for-profit businesses. Cover doctrine; learn practice concepts relevant to working as lawyers for nonprofit organizations, and advising nonprofit business clients as outside counsel and inside advisers; become familiar with organization, private governance, and public relations of these entities. Expose students to statutes, case law, regulation and nonprofit entity organization documents. Topics include formation and entity choice; the activities nonprofits can and cannot undertake, including commercial, lobbying, and political activities; fiduciary duties and governance in these entities; forms of fundraising; the investment and use of these entities' funds; and related issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING

LAW 620G Nonprofit Organizations**Crosslisted with:** LAW 620**Prerequisites:** Pre- or Co-requisite - Law 632 Business Associations

Description: Advanced course in business law, focusing on the law of not-for-profit businesses. Cover doctrine; learn practice concepts relevant to working as lawyers for nonprofit organizations, and advising nonprofit business clients as outside counsel and inside advisers; become familiar with organization, private governance, and public relations of these entities. Expose students to statutes, case law, regulation and nonprofit entity organization documents. Topics include formation and entity choice; the activities nonprofits can and cannot undertake, including commercial, lobbying, and political activities; fiduciary duties and governance in these entities; forms of fundraising; the investment and use of these entities' funds; and related issues.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 622 Taxation of Business Entities****Crosslisted with:** LAW 622G**Prerequisites:** Law 637 Individual Income Tax

Notes: Law 632 Business Associations is recommended, but not required, as a pre-requisite

Description: Provides an overview of the U.S. federal taxation of operations that occur within business entities, including within corporations, partnerships, limited liability companies, and S corporations. Topics covered will include entity selection and formation, the taxation of income from operations, and liquidating and non-liquidating distributions.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law Grades**LAW 622G Taxation of Business Entities****Crosslisted with:** LAW 622**Prerequisites:** Law 637 Individual Income Tax

Notes: Law 632 Business Associations is recommended, but not required, as a pre-requisite

Description: Provides an overview of the U.S. federal taxation of operations that occur within business entities, including within corporations, partnerships, limited liability companies, and S corporations. Topics covered will include entity selection and formation, the taxation of income from operations, and liquidating and non-liquidating distributions.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 625 Copyright Seminar****Crosslisted with:** LAW 625G**Notes:** Cannot have already taken Law 711

Description: The protection of literary, artistic, musical, and audiovisual works under the laws of copyright and unfair competition. Rights in computer programs, characters, titles, and useful articles. Home recording, photocopying, computer uses/Internet, and public performance.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING

LAW 625G Copyright Seminar**Crosslisted with:** LAW 625**Notes:** Cannot have already taken Law 711**Description:** The protection of literary, artistic, musical, and audiovisual works under the laws of copyright and unfair competition. Rights in computer programs, characters, titles, and useful articles. Home recording, photocopying, computer uses/Internet, and public performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL/SPR**Prerequisite for:** LAW 579, LAW 579G; LAW 583, LAW 583G; LAW 620, LAW 620G; LAW 636, LAW 636G; LAW 648, LAW 648G; LAW 658, LAW 658G; 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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**Prerequisite for:** LAW 579, LAW 579G; LAW 583, LAW 583G; LAW 620, LAW 620G; LAW 636, LAW 636G; LAW 648, LAW 648G; LAW 658, LAW 658G; 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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 634 Criminal Adjudication****Crosslisted with:** LAW 634G**Description:** Covers the criminal adjudication process 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**Grading Option:** Law Grades**Offered:** SPRING**LAW 634G Criminal Adjudication****Crosslisted with:** LAW 634**Description:** Covers the criminal adjudication process 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**Grading Option:** Law Grades**Offered:** SPRING

LAW 635 Family Law Practice**Crosslisted with:** LAW 635G**Prerequisites:** LAW 630/G**Notes:** Grading is done on a curve.

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.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law Grades**Offered:** SPRING**LAW 635G Family Law Practice****Crosslisted with:** LAW 635**Prerequisites:** LAW 630/G**Notes:** Grading is done on a curve.

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.

Credit Hours: 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law (G) Classes**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL/SPR

Prerequisite for: LAW 618, LAW 618G; LAW 622, LAW 622G; LAW 638, LAW 638G; LAW 648, LAW 648G; 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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR

Prerequisite for: LAW 618, LAW 618G; LAW 622, LAW 622G; LAW 638, LAW 638G; LAW 648, LAW 648G; 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**Grading Option:** Law Grades**Offered:** SPRING**Prerequisite for:** LAW 648, LAW 648G**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**Grading Option:** Law (G) Classes**Offered:** SPRING**Prerequisite for:** LAW 648, LAW 648G

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**Prerequisite for:** LAW 665, LAW 665G**LAW 640R International Law Seminar****Notes:** Students who have taken Law 640 International Law, are not able to enroll in Law 640R International Law Seminar.

Description: Builds upon and expands understanding of international and transnational law garnered in the mandatory 1L course. Examines applicable law for real-world international and transnational problems faced by governments, businesses, human rights and environmental non-governmental organizations, and even individuals, by looking at national (including federal and state), international (including treaty and customary international law), and private (e.g. corporate codes of conduct) rules and how such rules are made and how they interact.

Examines methods of resolving transnational disputes both at the national and international levels and how decisions can be enforced at both the national and international levels. Several mock exercises involving international negotiations, litigation, and interagency meetings. Spends a session or two critically examining recent international law cases within the US Supreme Court.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 641R Environmental Law Seminar**

Description: Introduction to Environmental Law. 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. No prior experience with environmental issues is required. All scientific and regulatory concepts will be presented in a straightforward, understandable manner. Economic and policy options will be identified and related to legislation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL**Prerequisite for:** 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**Grading Option:** Law (G) Classes**Offered:** FALL**Prerequisite for:** 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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**Prerequisite for:** LAW 585, LAW 585G**LAW 648 Business Planning****Crosslisted with:** LAW 648G

Prerequisites: Law 632 - Business Planning, Law 637 - Individual Income Tax, and Law 638 - Corporate Tax

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**Grading Option:** Law Grades**Offered:** SPRING

LAW 648G Business Planning**Crosslisted with:** LAW 648**Prerequisites:** Law 632 - Business Planning, Law 637 - Individual Income Tax, and Law 638 - Corporate Tax

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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 649 First Amendment****Crosslisted with:** LAW 649G

Description: Emphasizes protected individual civil liberties created by the First Amendment. These are freedom of speech, association and press (and first amendment privacy concerns) as well as the constitutional principles underlying the first amendment's command that the "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." Includes analysis of the origin and modern applicability of the state action concept in constitutional litigation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**LAW 649G First Amendment****Crosslisted with:** LAW 649

Description: Emphasizes protected individual civil liberties created by the First Amendment. These are freedom of speech, association and press (and first amendment privacy concerns) as well as the constitutional principles underlying the first amendment's command that the "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof." Includes analysis of the origin and modern applicability of the state action concept in constitutional litigation.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes

LAW 653 Forced Migration: Refugee and Asylum Law**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**Grading Option:** Law Grades**Offered:** SPRING**LAW 653G Forced Migration: Refugee and Asylum Law****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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL/SPR**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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**LAW 659 Special Topics in Technology Governance and Regulation****Crosslisted with:** LAW 659G**Notes:** Students must have completed at least two of the core Governance and Technology curriculum classes (Cyberlaw, Privacy, Cybersecurity, Networks and Infrastructure, and Platforms and Speech) or at least one of these classes and receive instructor permission prior to taking this class.**Description:** Class will cover advanced and contemporary issues in technology governance and regulation. Students read, discuss, and analyze recent scholarship, proposed regulations and legislation, and similar materials relating to contemporary topics; will engage in faculty led discussion of current regulatory and legislative topics relating to technology governance and also learn how to critically read and produce research in these fields.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law Grades**Offered:** FALL/SPR**LAW 659G Special Topics in Technology Governance and Regulation****Crosslisted with:** LAW 659**Notes:** Students must have completed at least two of the core Governance and Technology curriculum classes (Cyberlaw, Privacy, Cybersecurity, Networks and Infrastructure, and Platforms and Speech) or at least one of these classes and receive instructor permission prior to taking this class.**Description:** Class will cover advanced and contemporary issues in technology governance and regulation. Students read, discuss, and analyze recent scholarship, proposed regulations and legislation, and similar materials relating to contemporary topics; will engage in faculty led discussion of current regulatory and legislative topics relating to technology governance and also learn how to critically read and produce research in these fields.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**LAW 659R Special Topics in Technology Governance and Regulation Seminar****Notes:** Students must have completed at least two of the core Governance and Technology curriculum classes (Cyberlaw, Privacy, Cybersecurity, Networks and Infrastructure, and Platforms and Speech) or at least one of these classes and receive instructor permission prior to taking this class.**Description:** Class will cover advanced and contemporary issues in technology governance and regulation. Students read, discuss, and analyze recent scholarship, proposed regulations and legislation, and similar materials relating to contemporary topics; engage in faculty led discussion of current regulatory and legislative topics relating to technology governance and also learn how to critically read and produce research in these fields.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL/SPR**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 664R Race and the Law Seminar**

Description: Seminar examining the intersection of race and the law and, specifically, the role that law has played and continues to play in the oppression, subordination, and promotion of people and groups based on race. We will anchor our studies with a look at the historical periods involving slavery, the Civil War, the First Reconstruction, the Jim Crow era, and the Civil Rights Movement and Second Reconstruction, before examining contemporary issues of race in areas of the law such as land use, education, employment, policing, punishment, and elections

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades

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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 678 Banking Law Seminar****Crosslisted with:** LAW 678G**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 678G Banking Law Seminar****Crosslisted with:** LAW 678**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**LAW 679 Food & Drug Law and Policy: Regulation of Safety and Marketing****Crosslisted with:** LAW 679G**Description:** Examination of federal laws and regulations that govern food & drug safety, labeling and marketing, shared by federal agencies, including the Food and Drug Administration and U.S. Department of Agriculture. History of federal food safety laws and enforcement, pharmaceutical drug regulation and medical device regulation and compliance.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law Grades**Offered:** SPRING**LAW 679G Food & Drug Law and Policy: Regulation of Safety and Marketing****Crosslisted with:** LAW 679**Description:** Examination of federal laws and regulations that govern food & drug safety, labeling and marketing, shared by federal agencies, including the Food and Drug Administration and U.S. Department of Agriculture. History of federal food safety laws and enforcement, pharmaceutical drug regulation and medical device regulation and compliance.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**Prerequisite for:** LAW 585, LAW 585G**LAW 681 Cyberlaw - Jurisdiction and Laws Governing Users****Crosslisted with:** LAW 681G**Prerequisites:** Law 775 Technology Law: Concepts**Notes:** Available to online LLM students.**Description:** Covers civil and criminal procedure issues as applied in the online context, along with a range of specific substantive issues such as online contract formation, basic regulation of encryption, the operation and history of Section 230 of the Telecommunications Act, the Electronic Communications Protection Act and the Computer Fraud and Abuse Act as well as the various challenges relating to international jurisdictional disputes and the application of domestic laws to a global internet.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**LAW 681G Cyberlaw - Jurisdiction and Laws Governing Users****Crosslisted with:** LAW 681**Prerequisites:** Law 775 Technology Law: Concepts**Notes:** Available to online LLM students.**Description:** Covers civil and criminal procedure issues as applied in the online context, along with a range of specific substantive issues such as online contract formation, basic regulation of encryption, the operation and history of Section 230 of the Telecommunications Act, the Electronic Communications Protection Act and the Computer Fraud and Abuse Act as well as the various challenges relating to international jurisdictional disputes and the application of domestic laws to a global internet.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 682 Manfred Lachs Space Law Moot Court Competition****Description:** Competition based on a hypothetical space law dispute before the International Court of Justice. Time-intensive competition. Teams write briefs/memorials for both sides and must be prepared to argue both sides.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 2**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 684R Bioethics and the Law Seminar**

Description: Issues in bioethics arise when developments in medicine and the life sciences (the "bio-" in bioethics) have difficult moral implications (the "-ethics" in bioethics). In this course we will touch on several areas of bioethics. Our principal focus will be on issues in death and dying, but we will also take up issues arising in human reproduction.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 685R Capital Punishment Seminar**

Description: Examine legal doctrine and policy regarding capital punishment in the United States, drawing heavily but not exclusively on decisions by the United States 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. Direct primary attention to the court cases and to the legal doctrine and policy issues arising out of those court cases.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 687 Public Health Law****Crosslisted with:** LAW 687G

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**Grading Option:** Law Grades**Offered:** FALL/SPR**LAW 687G Public Health Law****Crosslisted with:** LAW 687

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**Grading Option:** Law (G) Classes**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL

LAW 691 Special Topics in International Trade

Crosslisted with: LAW 691G

Description: Varying topics in International Trade

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Law Grades

Offered: FALL/SPR

LAW 691G Special Topics in International Trade

Crosslisted with: LAW 691

Description: Varying topics in International Trade

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Law (G) Classes

Offered: FALL/SPR

LAW 692 State and Local Taxation

Crosslisted with: LAW 692G

Notes: For students interested in public policy, state and local government, or issues of federalism. No previous tax course to enroll or succeed in this course.

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: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law Grades

Offered: FALL/SPR

LAW 692G State and Local Taxation

Crosslisted with: LAW 692

Notes: For students interested in public policy, state and local government, or issues of federalism. No previous tax course to enroll or succeed in this course.

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: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law (G) Classes

Offered: FALL/SPR

LAW 692R State and Local Taxation Seminar

Description: Covers how state and local governments raise revenues and how the U.S. Constitution limits their choices. Look specifically 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. Also look at the structure of state income, sales, and property taxes. Focus on interest in public policy, state and local government, or issues of federalism.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law Grades

LAW 693R Law and Economic Development Seminar

Crosslisted with: LAW 693RG

Description: Address the impact of law, legal frameworks, and institutions (LFIs) on social and economic development which have significant impacts on development, particularly economic development. Explore the theories and practices pertaining to law and development. Explain how LFIs affect economic development in key areas such as property rights, political governance, regulatory framework for business transactions, industrial promotion, banking and financing, labor, corruption, and international legal frameworks (international economic law and international development law). Examine law and development issues in developing countries as well as developed countries, such as the United States. Knowledge in economics or development study is helpful but NOT required to take this course.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law Grades

LAW 693RG Law and Economic Development Seminar

Crosslisted with: LAW 693R

Description: Address the impact of law, legal frameworks, and institutions (LFIs) on social and economic development which have significant impacts on development, particularly economic development. Explore the theories and practices pertaining to law and development. Explain how LFIs affect economic development in key areas such as property rights, political governance, regulatory framework for business transactions, industrial promotion, banking and financing, labor, corruption, and international legal frameworks (international economic law and international development law). Examine law and development issues in developing countries as well as developed countries, such as the United States. Knowledge in economics or development study is helpful but NOT required to take this course.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law (G) Classes

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 695 Clinical-Children's Justice****Crosslisted with:** LAW 695G**Prerequisites:** Law 790G - Legal Profession

Notes: Two semester course: students receive 4-6 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: 4-6**Min credits per semester:** 4**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Law Grades**Offered:** FALL/SPR**LAW 695G Clinical-Children's Justice****Crosslisted with:** LAW 695**Prerequisites:** Law 790G - Legal Profession

Notes: Two semester course: students receive 4-6 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: 4-6**Min credits per semester:** 4**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 698R Natural Resources Law Seminar**

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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 700 Mediation Competition**

Description: The International Mediation Competition involves students competing in teams of three and role playing as mediators, clients, and attorneys in a variety of hypothetical cases. In preparation of the competition, students engage in an eight-week program to learn or refresh the skills associated with the roles of mediator and advocate, applying them to different types of factual disputes. The students are expected to travel to the competition location and compete in the three preliminary rounds, and any additional rounds for which the team qualifies.

Credit Hours: 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**LAW 702 Introduction to the U.S. Legal System and Constitutional Principles for LL.M. Students****Crosslisted with:** LAW 702G

Notes: Enrollment in this course is limited to international students enrolled in the Global Legal Practice LL.M. program.

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**Grading Option:** Law Grades**Offered:** FALL/SPR

LAW 702G Introduction to the U.S. Legal System and Constitutional Principles for LL.M. Students**Crosslisted with:** LAW 702**Notes:** Enrollment in this course is limited to international students enrolled in the Global Legal Practice LL.M. program.**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 704R Agricultural Law Seminar****Description:** Agricultural Law addresses two general subjects: (1) the business and economic regulation aspects of the industry and (2) environmental regulation. As for the first general subject, the course deals with the Farm Bill and its administration, restrictions on business entities in farming, land leases and purchases, commercial regulation like Articles 2, 7 and 9 of the UCC, and other subjects that are unique to the agricultural industry. As for the second general subject, the course covers the Clean Water Act and the Conservation Title of the Farm Bill. This course serves as a good introduction to the more general subjects it implicates. You could also use it as a "capstone" to see how the more general subjects you have covered apply in the agricultural industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 705 Writing for Law Practice****Crosslisted with:** LAW 705G**Prerequisites:** LAW 513/513G and LAW 514/514G or equivalent with approval of professor**Description:** Focus on writing for law practice. Draft and revise several documents; engage in editing, workshopping, and peer critique with intensive feedback from the instructor. Beginnings of a document portfolio to take into first years of law practice.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 705G Writing for Law Practice****Crosslisted with:** LAW 705**Prerequisites:** LAW 513/513G and LAW 514/514G or equivalent with approval of professor**Description:** Focus on writing for law practice. Draft and revise several documents; engage in editing, workshopping, and peer critique with intensive feedback from the instructor. Beginnings of a document portfolio to take into first years of law practice.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**LAW 707G International Human Rights Law Seminar****Crosslisted with:** LAW 707R

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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 707R 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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law Grades**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:** 3-4**Min credits per semester:** 3**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Law (G) Classes**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**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**Grading Option:** Law Grades

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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING

LAW 719 National Security Law**Crosslisted with:** LAW 719G

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**Grading Option:** Law Grades**Offered:** FALL**LAW 719G National Security Law****Crosslisted with:** LAW 719

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**Grading Option:** Law (G) Classes**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades

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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 726 Platforms: Networks and Infrastructure****Crosslisted with:** LAW 726G**Prerequisites:** LAW 775 TECHNOLOGY LAW: CONCEPTS**Notes:** Available to online LLM students.**Description:** Focus on the network and infrastructure layers of the Internet, including the role of the FCC, the Communications and Telecommunications Acts, and specific topics such as robocalls, structural media regulation, net neutrality, and universal service.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING**LAW 726G Platforms: Networks and Infrastructure****Crosslisted with:** LAW 726**Prerequisites:** LAW 775 TECHNOLOGY LAW: CONCEPTS**Notes:** Available to online LLM students.**Description:** Focus on the network and infrastructure layers of the Internet, including the role of the FCC, the Communications and Telecommunications Acts, and specific topics such as robocalls, structural media regulation, net neutrality, and universal service.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 726R Platforms: Networks and Infrastructure Seminar****Prerequisites:** LAW 775 Technology Law: Concepts**Description:** Focus on the network and infrastructure layers of the Internet, including the role of the FCC, the Communications and Telecommunications Acts, and specific topics such as robocalls, structural media regulation, net neutrality, and universal service.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 729 Civil Rights Litigation****Crosslisted with:** LAW 729G**Prerequisites:** LAW 516/G, 517/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**Grading Option:** Law Grades**LAW 729G Civil Rights Litigation****Crosslisted with:** LAW 729**Prerequisites:** LAW 516/G, 517/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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 732 Constitutional Law II****Crosslisted with:** LAW 732G**Notes:** LAW 609G is not a prerequisite for this course.**Description:** 14th Amendment Rights course - substantive and procedural due process; equal protection; incorporation of the Bill of Rights; state action. May include coverage of Second Amendment; and of Section 5 enforcement of the Fourteenth Amendment**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SPRING

LAW 732G Constitutional Law II**Crosslisted with:** LAW 732**Notes:** LAW 609G is not a prerequisite for this course.**Description:** 14th Amendment Rights course - substantive and procedural due process; equal protection; incorporation of the Bill of Rights; state action. May include coverage of Second Amendment; and of Section 5 enforcement of the Fourteenth Amendment**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 732R Constitutional Law II Seminar****Description:** Following Constitutional Law I's emphasis on the structure of government, Constitutional Law II emphasizes the U.S. Constitution's protections for individual rights and equality. Topics include equal protection; voting rights; substantive and procedural due process; gun rights; incorporation of the Bill of Rights against states and "reverse incorporation" of equal protection against the federal government; Congress' textual powers to "enforce" certain grants of rights; and the state action doctrine. First Amendment rights concerning speech and religion are mostly left to Constitutional Law: First Amendment, a separate course. Constitutional rights involving the criminal process are mostly left to courses such as Criminal Procedure, Criminal Adjudication, and Capital Punishment.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 735 Clinical Practice: Housing Justice****Prerequisites:** Pre- or co- requisite: Law 790 Legal Profession**Notes:** Open only to students with senior standing.**Description:** Students, under close faculty supervision, represent tenants in eviction matters and other legal matters related to housing. The course includes a classroom component which focuses on the development of knowledge and skills necessary to represent clients in the areas of eviction defense, enforcement of tenant rights, and housing discrimination, among other housing-related legal issues.**Credit Hours:** 6**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Law Grades**Offered:** FALL/SPR**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**Prerequisite for:** LAW 798, LAW 798G; LAW 798B**LAW 742 Transactional Skills****Crosslisted with:** LAW 742G

Description: Learn contract drafting and negotiation for transactions

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 742G Transactional Skills****Crosslisted with:** LAW 742

Description: Learn contract drafting and negotiation for transactions

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades

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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL

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**Grading Option:** Law (G) Classes**Offered:** FALL**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades

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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Law Grades**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Law (G) Classes**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Law Grades**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: 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL/SPR**Prerequisite for:** LAW 782, LAW 782G; LAW 799, LAW 799G**Course and Laboratory Fee:** \$120**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:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**Prerequisite for:** LAW 782, LAW 782G; LAW 799, LAW 799G**Course and Laboratory Fee:** \$120**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 763R Mental Health Law Seminar****Notes:** Credit may only be earned in either LAW 763 or LAW 763R, but not both.**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL

LAW 766 National Space Legislation**Crosslisted with:** LAW 766G**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**Grading Option:** Law Grades**Offered:** FALL**LAW 766G National Space Legislation****Crosslisted with:** LAW 766**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** SPRING**Prerequisite for:** LAW 768, LAW 768G**LAW 767C Estate Planning Clinic****Prerequisites:** Law 790 Legal Profession

Description: Students, under close faculty supervision, will represent clients in the provision of estate planning services, including the disbursing of legal advice and the drafting of basic estate planning documents, including a simple will, a power of attorney instrument, advance directives, and title documents. In addition to the direct client work, there is a classroom component (substantive seminars), and students will meet at least weekly with their faculty supervisor for case review.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** SUMMER**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**Grading Option:** Law (G) Classes**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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: 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** FALL

LAW 775 Technology Governance and Regulation: Concepts**Crosslisted with:** LAW 775G**Notes:** This course is PASS/NO PASS - not graded**Description:** Capstone course introducing technical concepts such as how the internet works; the foundational legal concepts, such as the First and Fourth Amendment; regulatory concepts such as administrative and antitrust law.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Law Grades**Offered:** FALL/SPR**Prerequisite for:** LAW 582G, LAW 582; LAW 601, LAW 601G; LAW 681, LAW 681G; LAW 726, LAW 726G; LAW 726R; LAW 787, LAW 787G; LAW 787R**LAW 775G Technology Governance and Regulation: Concepts****Crosslisted with:** LAW 775**Notes:** This course is PASS/NO PASS - not graded**Description:** Capstone course introducing technical concepts such as how the internet works; the foundational legal concepts, such as the First and Fourth Amendment; regulatory concepts such as administrative and antitrust law.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**Prerequisite for:** LAW 582G, LAW 582; LAW 601, LAW 601G; LAW 681, LAW 681G; LAW 726, LAW 726G; LAW 726R; LAW 787, LAW 787G; LAW 787R**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 776R Water Law Planning & Policy Seminar****Description:** Water law covers judicial, legislative, and administrative issues in water resources development, allocation, control, and conservation. Representative topics include: the acquisition, maintenance, and transfer of private rights to use surface water and groundwater; interstate allocation; public access rights; environmental protection; tribal water rights; and federal rights and powers.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL/SPR**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**Grading Option:** Law Grades**Offered:** FALL**LAW 779 Selected Topics in Property and Natural Resources Law****Crosslisted with:** LAW 779G**Description:** Covers advanced topics in property and natural resources law. Considers legal and interdisciplinary approaches to solving some of our most pressing environmental, social, and economic challenges. Representative topics, subject to instructor discretion, will consider how property and natural resource laws relate to modern food systems, energy infrastructure, housing provision, climate change, public land access and management, and further issues of environmental, economic, and racial justice. Complete a significant writing requirement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**LAW 779G Selected Topics in Property and Natural Resources Law****Crosslisted with:** LAW 779**Description:** Covers advanced topics in property and natural resources law. Considers legal and interdisciplinary approaches to solving some of our most pressing environmental, social, and economic challenges. Representative topics, subject to instructor discretion, will consider how property and natural resource laws relate to modern food systems, energy infrastructure, housing provision, climate change, public land access and management, and further issues of environmental, economic, and racial justice. Complete a significant writing requirement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law (G) Classes

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:

Grading Option: Pass No-Pass

Offered: FALL

LAW 781G Constitutional Problems Seminar

Crosslisted with: LAW 781R

Description: Selected constitutional issues of current importance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law (G) Classes

Offered: SPRING

LAW 781R 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

Grading Option: Law Grades

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

Grading Option: Law Grades

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

Grading Option: Law (G) Classes

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

Grading Option: Law Grades

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

Grading Option: Law (G) Classes

LAW 783R Insurance Law Seminar

Description: Focus on property and liability insurance, in both a personal and commercial context. Insurance is one of the primary ways individuals and businesses protect themselves against risk and so it becomes relevant in most commercial transactions and in our personal and professional lives. Not only focuses on how courts resolve the most prominent issues associated with these insurance policies, but how to read insurance contracts and what is contained in the most common form of policies. The purpose is to position you to not only advise clients but also to have more comfort in knowing what is in your own personal policies.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Law Grades

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

Grading Option: Law Grades

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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING

LAW 787 Platforms: Speech and Media**Crosslisted with:** LAW 787G**Prerequisites:** Law 775 Technology Governance and Regulation: Concepts

Description: Deals with the law and practice of content governance in both online and more traditional media. Begins with an overview of basic First Amendment principles, and then proceeds to more specific doctrines concerning the regulation of various types of sensitive subject matter including incitement, hate speech, pornography, and misinformation. Examines the content governance practices of privately-owned online platforms. Examines the First Amendment and statutory doctrines that shield and protect the editorial and content governance practices of various types of intermediaries-newspapers, broadcasters, cable providers, search engines, social platforms, and online platforms more generally. Discusses various levers of state influence over platforms' handling of third-party content.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law Grades**Offered:** FALL**LAW 787G Platforms: Speech and Media****Crosslisted with:** LAW 787**Prerequisites:** Law 775 Technology Governance and Regulation: Concepts

Description: Deals with the law and practice of content governance in both online and more traditional media. Begins with an overview of basic First Amendment principles, and then proceeds to more specific doctrines concerning the regulation of various types of sensitive subject matter including incitement, hate speech, pornography, and misinformation. Examines the content governance practices of privately-owned online platforms. Examines the First Amendment and statutory doctrines that shield and protect the editorial and content governance practices of various types of intermediaries-newspapers, broadcasters, cable providers, search engines, social platforms, and online platforms more generally. Discusses various levers of state influence over platforms' handling of third-party content.

Credit Hours: 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 787R Platforms: Speech and Media Seminar****Prerequisites:** Law 775 Technology Governance and Regulation: Concepts

Description: Deals with the law and practice of content governance in both online and more traditional media. Begins with an overview of basic First Amendment principles, and then proceeds to more specific doctrines concerning the regulation of various types of sensitive subject matter including incitement, hate speech, pornography, and misinformation. Examines the content governance practices of privately-owned online platforms. Examines the First Amendment and statutory doctrines that shield and protect the editorial and content governance practices of various types of intermediaries-newspapers, broadcasters, cable providers, search engines, social platforms, and online platforms more generally. Discusses various levers of state influence over platforms' handling of third-party content.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**Offered:** FALL**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**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**Grading Option:** Law Grades**Offered:** FALL/SPR**Prerequisite for:** LAW 658, LAW 658G; LAW 695G, LAW 695; LAW 735; LAW 767C; LAW 794; LAW 798, LAW 798G; LAW 799, LAW 799G**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**Grading Option:** Law (G) Classes**Offered:** FALL/SPR**Prerequisite for:** LAW 658, LAW 658G; LAW 695G, LAW 695; LAW 735; LAW 767C; LAW 794; LAW 798, LAW 798G; LAW 799, LAW 799G**LAW 791 JSD Research****Crosslisted with:** LAW 791G**Notes:** Applicant must hold a JD or LLM from an ABA-accredited American Law School; Four semesters required.**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**Grading Option:** Pass No-Pass**Offered:** FALL/SPR**LAW 791G JSD Research****Crosslisted with:** LAW 791**Notes:** Applicant must hold a JD or LLM from an ABA-accredited American Law School; Four semesters required.**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**Grading Option:** Pass No-Pass**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 six 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:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Pass No-Pass**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes

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:** 2-6**Min credits per semester:** 2**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Law Grades**Offered:** ALL**LAW 795 LL.M. Research Independent Study****Notes:** Available to online LLM students.**Description:** Required Independent Study for LLM students in which they are required to participate in bi-weekly brown bag lunch sessions of space, cyber, and telecom law topics throughout the year and produce a 5,000 -7,000 word article of publishable quality. In the second half of spring semester students will present the paper written for the class.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law (G) Classes**Offered:** SPRING**LAW 797 Native American Law Seminar****Crosslisted with:** LAW 797G**Prerequisites:** Law 609 Constitutional Law I**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**Grading Option:** Law Grades**Offered:** FALL**LAW 797G Native American Law Seminar****Crosslisted with:** LAW 797**Prerequisites:** Law 609 Constitutional Law I**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**Grading Option:** Law (G) Classes**Offered:** FALL**LAW 798 Clinical Practice-Civil****Crosslisted with:** LAW 798G**Prerequisites:** Pre- or Co-Requisite: Law 790 or Law 790G Legal Profession; Pre- or Co-Requisite: Law 741 or Law 741G Pretrial Litigation**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:** 2-6**Min credits per semester:** 2**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Law Grades**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**Grading Option:** Law Grades**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**Grading Option:** Law Grades**Offered:** SUMMER**LAW 798G Clinical Practice-Civil****Crosslisted with:** LAW 798**Prerequisites:** Pre- or Co-Requisite: Law 790 or Law 790G Legal Profession; Pre- or Co-Requisite: Law 741 or Law 741G Pretrial Litigation**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:** 2-6**Min credits per semester:** 2**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Law (G) Classes**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:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Law Grades**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:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Law (G) Classes**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**Grading Option:** Grade Pass/No Pass Option

Management (MNGT)

MNGT 811 Leading People and Projects**Crosslisted with:** MNGT 411**Prerequisites:** Junior standing**Notes:** 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**Grading Option:** Graded

MNGT 817 Positivity for Managers

Description: An overview of most recent developments in the fields of positive psychology, mindfulness, and positive organizational scholarship. Will focus on proven positive psychology practices to develop skills to promote flourishing in yourself and those around you. Emphasis on how positivity can be applied at an organizational level to improve leadership and employee engagement.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

MNGT 818 Organization Designs for Competitive Advantage

Description: The process of developing organization designs to increase competitive advantage. Discuss live cases of organizations, evaluate how well their structures support the strategies the Top Management Team has devised, and the impact on overall organizational success.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

MNGT 819 Strategies for Sustainability

Description: Provides an examination of the challenges affecting business as a consequence of the overuse of natural resources and our potential to do damage to the world's eco- and natural systems. Will examine these issues with an eye on how such challenges affect business in general, and some industries and sectors in particular.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL/SPR

MNGT 821 Identifying and Exploring Entrepreneurial Opportunities

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

MNGT 840 Corporate Strategy and Entrepreneurship

Description: Understand, analyze, and problem solve around the array of decisions that, entrepreneurs, managers, and CEOs consider when determining where and how to grow. Learn and apply qualitative decision frameworks that enable more thorough decision analysis to your own company or a company that you work for, cases studies, and your own personal growth path

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: MNGT 988

MNGT 851 Strengths Coaching, Theory and Practice

Crosslisted with: MNGT 451

Prerequisites: Accepted as a Student Strengths Coach.

Notes: Required course towards becoming a Certified Student Strengths Coach through the Clifton Strengths Institute.

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

Grading Option: Graded

Offered: SPRING

MNGT 859 Managerial Negotiations

Crosslisted with: MRKT 859

Description: Designed to help managers and professionals deal with a broad range of negotiation issues. Provides an understanding of the theory and processes of negotiations and develops skills that can be used to negotiate in a variety of settings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

MNGT 866 The Regulatory Environment for Employment and Labor

Crosslisted with: ECON 485, MNGT 466, ECON 885

Prerequisites: Junior standing; MNGT 361

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

Grading Option: Graded

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

Grading Option: Graded

Offered: FALL/SPR

MNGT 875 Business Strategies**Crosslisted with:** MNGT 475**Prerequisites:** Open only to students in the College of Business. SR; 2.5 GPA; major in the College of Business; BSAD220; ACCT201 and ACCT202; ECON211 and ECON212; FINA 361; SCMA350 and SCMA331; MNGT301; SCMA 331; MRKT 341; 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:** Learn the principal concepts, frameworks, and techniques of strategic management. Formulate and apply business strategies, analyze cases, explore business simulations, and gain an understanding and appreciation of how strategy affects careers, company performance, and industry attractiveness.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**MNGT 981 Seminar in Labor Relations****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MNGT 982 Seminar in Human Resource Management****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**MNGT 984 Seminar in Operations Management****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

Marketing (MRKT)

MRKT 821 Applied Marketing Research

Prerequisites: GRBA 813 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

Grading Option: Graded

Offered: SPRING

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

Grading Option: Graded

MRKT 824 Advanced Quantitative Analysis in Marketing

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

MRKT 850 Data-Driven Decision Making

Prerequisites: One or more graduate or undergraduate statistics classes that cover basic statistics through least-squares regression or Permission.

Description: Understanding tools and techniques that can be used for making strategic and tactical marketing decisions in areas such as pricing, sales, advertising, new product demand forecasting, and allocation of resources. Topics covered include market response models, linear models, 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

Grading Option: Graded

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**Grading Option:** Graded**MRKT 857 Consultative Selling****Description:** Teaches the consultative selling model and the skills that make it work - interpersonal, communication, presentation, facilitation, and problem solving skills. Covers the dynamics of a sales call, planning for the call, identifying customers' needs, developing solutions, building customer relationships, and the tools and technologies that facilitate the sales process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 858 Sales Leadership****Description:** Provides a conceptual and applied understanding of the strategic and operational aspects of successfully managing a sales force, including developing sales forecasts, setting quotas and budgets, structuring the sales force, managing sales territories, hiring, training and leading salespeople, developing effective compensation and incentive systems, evaluating performance of salespeople, and analyzing the unit's sales volume, cost and profitability.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 859 Managerial Negotiations****Crosslisted with:** MNGT 859**Description:** Designed to help managers and professionals deal with a broad range of negotiation issues. Provides an understanding of the theory and processes of negotiations and develops skills that can be used to negotiate in a variety of settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MRKT 921 Seminar in Marketing Communication Strategy****Prerequisites:** Permission.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921A Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921B Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921D Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921E Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921G Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 921J Seminar in Marketing Communication Strategy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931 Marketing Channels Topical Seminar****Prerequisites:** Permission.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

MRKT 931A Marketing Channels Topical Seminar**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931B Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931D Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931E Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931G Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MRKT 931J Marketing Channels Topical Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MRKT 958 Seminar in Selling and Sales Management****Prerequisites:** Permission**Notes:** No additional resources are required to offer this Ph.D. seminar.**Description:** Introduction to the literature on selling and sales management. Coverage of topics related to managing salespeople, the process of buying and selling, and strategic and operational issues in sales.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

MRKT 972 Seminar: Behavioral Research in Marketing**Prerequisites:** Permission**Description:** Introduction to the literature on consumer behavior.

Exposure to perspectives from social sciences such as anthropology, economics, psychology, and sociology to understand actions and processes underlying how consumers purchase and use products and services.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MRKT 998A Seminar in Special Topics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**MRKT 998D Seminar in Special Topics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**Prerequisite for:** MATL 875; MATL 960; MATL 962**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: MATL 875; MATL 960; MATL 970; MATL 972

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

Grading Option: Graded

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

Grading Option: Graded

MATL 873 Corrosion**Crosslisted with:** MATL 473**Prerequisites:** CHEM 109A and CHEM 109L 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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MATL 892 Special Topics****Crosslisted with:** MATL 492**Description:** Special topics in materials engineering and related areas.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

MATH 807 Mathematics for High School Teaching I

Crosslisted with: MATH 407

Prerequisites: MATH 208/208H and MATH 309 or MATH 310.

Notes: Open only MATH majors with a declared Education option.

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

MATH 808 Mathematics for High School Teaching II

Crosslisted with: MATH 408

Prerequisites: MATH 412 and MATH 309 or MATH 310.

Notes: Open only MATH majors with a declared Education option.

Description: Analysis of the connections between college mathematics and high school algebra and geometry.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MATH 814 Linear Algebra**Prerequisites:** A grade of P, C, or better in MATH 107 or MATH 107H**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 linear equations, vector spaces, inner products, determinants, eigenvalues and eigenvectors, and diagonalization.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 415, MATH 815; MATH 842**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**Grading Option:** Graded**MATH 815 Theory of Linear Transformations****Crosslisted with:** MATH 415**Prerequisites:** MATH 314/814; and MATH 309, MATH 310, or MATH 325.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 818**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 901; MATH 902; MATH 905; MATH 921; MATH 922; MATH 928; MATH 929**MATH 821 Differential Equations****Prerequisites:** A grade of P, C, or better in MATH 107 or MATH 107H**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 842; MATL 472, MATL 872; MATL 970; MECH 416, MECH 816; MECH 449, MECH 849; MECH 454, MECH 854; MECH 480, MECH 880; MECH 810; MECH 933; MECH 936; MECH 937; MECH 938; METR 880; PHYS 451, PHYS 851**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**Grading Option:** Grade Pass/No Pass Option

MATH 824 Introduction to Partial Differential Equations**Crosslisted with:** MATH 424**Prerequisites:** A grade of P, C, or better in MATH 208/208H and MATH 221/221H.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MECH 812**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 826**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 921; MATH 922; MATH 924; MATH 925; MATH 941**MATH 828 Principles of Operations Research****Crosslisted with:** MATH 428**Prerequisites:** MATH 314 or MATH 314H; and RAIK 270H, 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**Grading Option:** Grade Pass/No Pass Option**MATH 830 Differential Equations I****Prerequisites:** MATH 325**Description:** Phase diagrams, bifurcation theory, linear systems, the matrix exponential function, Floquet theory, stability theory, existence (Poincaré-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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 831**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**Grading Option:** Grade Pass/No Pass Option**MATH 833 Nonlinear Optimization****Crosslisted with:** MATH 433**Prerequisites:** MATH 208/208H; MATH 314/314H; and MATH 309, 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**MATH 839 Mathematical Biology****Crosslisted with:** MATH 439**Prerequisites:** MATH 221/221H & MATH 314/314H.**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**Grading Option:** Grade Pass/No Pass Option

MATH 840 Numerical Analysis I

Crosslisted with: CSCE 440, CSCE 840, MATH 440

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CSCE 942, MATH 942

Course and Laboratory Fee: \$20

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CSCE 942, MATH 942

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

Grading Option: Grade Pass/No Pass Option

MATH 845 Number Theory

Crosslisted with: MATH 445

Prerequisites: MATH 310.

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: CSCE 942, MATH 942

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: MATH 852

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: MATH 856; MATH 872; MATH 921; MATH 922

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

Grading Option: Grade Pass/No Pass Option

MATH 887 Probability Theory**Crosslisted with:** MATH 487**Prerequisites:** MATH 314 or MATH 314H; and MATH 309, MATH 310, or 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**Grading Option:** Grade Pass/No Pass Option**MATH 889 Stochastic Processes****Crosslisted with:** MATH 489**Prerequisites:** MATH 314 or MATH 314H; and STAT 380 or RAIK 270H.**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**Grading Option:** Grade Pass/No Pass Option**MATH 893 Seminar in Mathematics****Crosslisted with:** MATH 493**Prerequisites:** Permission.**Description:** Topics in one or more branches of mathematics.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 8**Grading Option:** Grade Pass/No Pass Option**MATH 894 Independent Study in Mathematics****Prerequisites:** Permission.**Description:** Directed reading or research with a faculty member.**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 953**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 915; MATH 953**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**MATH 918 Topics in Algebra****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 18**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MATH 928; MATH 929

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

Grading Option: Grade Pass/No Pass Option

MATH 923 Topics in Analysis

Credit Hours: 3-6

Min credits per semester: 3

Max credits per semester: 6

Max credits per degree: 18

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: MATH 937

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MATH 990 Topics in Topology**Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 18**Grading Option:** Grade Pass/No Pass Option**MATH 993 Seminar in Mathematics****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**Grading Option:** Grade Pass/No Pass Option**MATH 994 Independent Study in Mathematics****Prerequisites:** Permission.**Description:** Independent reading or research directed by a faculty member.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**MATH 995 Research Seminar****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**Prerequisite for:** MECH 802**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 904**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 912; MECH 916**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** AREN 810; MECH 404, MECH 804; MECH 487; MECH 922; MECH 923; MECH 924**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 932**MECH 833 Microscale Transport Phenomena in Biosystems****Crosslisted with:** MECH 433**Prerequisites:** MECH 310**Notes:** Knowledge of engineering mathematics to describe physical systems, especially transport phenomena**Description:** An introduction to transport phenomena with an emphasis on applying the principles of mass transfer and fluid dynamics to microscale biosystems including microorganisms. Topics include Brownian motion, diffusion-based mass transfer, cellular receptors, Taylor dispersion, bacterial diffusion, chemotaxis, low Reynolds number fluid dynamics, hydrodynamics of swimming microorganisms, surface tension and microfluidics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MECH 835 Introduction to Cell Mechanics****Crosslisted with:** MECH 435**Notes:** Knowledge of calculus and basic physics to describe physical systems**Description:** An introduction to cell mechanics with an emphasis on application of fundamental mechanics and various experimental methods to understanding cell mechanics. Topics include cell structure, basic solid/fluid/statistical mechanics, biopolymer mechanics, cytoskeletal network mechanics, cellular adhesion and motility, and mechanobiology.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MECH 836 Introduction to Continuum Biomechanics****Crosslisted with:** MECH 436**Prerequisites:** Senior or graduate student standing**Notes:** MATH 314 and MECH 325 are recommended.**Description:** An introduction to continuum biomechanics with an emphasis on soft tissues. Case studies covering diverse applications of biomechanics in biology and medicine, including in the areas of mechanobiology, medical devices, and tissue engineering. Continuum mechanics concepts include kinematics, kinetics, balance laws, and constitutive relations. Includes some programming in MATLAB.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**MECH 837 Biomedical Device Design****Crosslisted with:** MECH 437**Prerequisites:** MECH 223, MECH 373**Notes:** basic understanding of solid mechanics**Description:** Design of devices intended for use in biomedical environments. Introduction to modeling of the bio-environment, 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**Grading Option:** Graded**Offered:** SPRING

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**Grading Option:** Grade Pass/No Pass Option**MECH 839 Biomaterial Surface Patterning****Crosslisted with:** MECH 439**Description:** Biomaterials, biocompatibility, and biomaterial surface characteristics (chemistry, surface energy, topography, wettability, etc.). Protein adsorption on biomaterials. Microscale and nanoscale chemical patterning; anisotropic and isotropic micro/nanotopography; cell sensing and response to patterned substrates.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 943**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 945**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded**Prerequisite for:** MECH 915; MECH 930; MECH 933; MECH 935;

MECH 937; MECH 938; MECH 939; MECH 940; MECH 941; 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**Grading Option:** Graded**Prerequisite for:** MECH 915; 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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MECH 950; MECH 951**Course and Laboratory Fee:** \$25

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**Grading Option:** Graded**Prerequisite for:** MECH 952**Course and Laboratory Fee:** \$25**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**MECH 870 Theory and Practice of Materials Processing****Crosslisted with:** MECH 470**Prerequisites:** MECH 370**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**Grading Option:** Graded**Prerequisite for:** MECH 970**MECH 872 Additive Manufacturing****Crosslisted with:** MECH 472**Prerequisites:** MECH 370 or parallel**Description:** Hands-on exposure to several aspects of Additive Manufacturing (AM): (1) design and experimentation; (2) process optimization; and (3) materials testing. Coverage of a variety of AM technologies, their advantages and limitations, and how to design for AM. Discussion of both polymer and metal technologies, and exploration of recent applications of AM across multiple industries.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** MECH 975**Course and Laboratory Fee:** \$25**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**Grading Option:** Graded**MECH 880 Numerical Methods in Engineering****Crosslisted with:** MECH 480**Prerequisites:** MATH 221/MATH 821; CSCE 155N.**Notes:** MATH 314 recommended. Credit towards the degree cannot be earned in both CSCE/MATH 440/840 and MECH 480/880.**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 value 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**Grading Option:** Graded**Prerequisite for:** CHME 496, CHME 896; MECH 851; MECH 888**Course and Laboratory Fee:** \$25**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 812; MECH 932**MECH 891 Special Topics in Engineering Mechanics****Crosslisted with:** MECH 491**Prerequisites:** Permission.**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**Grading Option:** Graded**Course and Laboratory Fee:** \$25**MECH 892 Special Topics****Crosslisted with:** MECH 492**Description:** Special topics in mechanical engineering and related areas.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Grading Option:** Graded

MECH 894 Independent Study**Crosslisted with:** MECH 494**Prerequisites:** Permission**Description:** Faculty-supervised independent study.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 24**Grading Option:** Graded**MECH 898 Research****Crosslisted with:** MECH 498**Description:** Faculty-supervised research.**Credit Hours:** 0-6**Min credits per semester:****Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MECH 910 Continuum Mechanics****Prerequisites:** MECH 325**Notes:** Linear Algebra I helpful**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**Grading Option:** Graded**Prerequisite for:** MECH 939**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MECH 951

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

MECH 929 Functional Tissue Engineering

Description: Functional tissue engineering and cellular mechanotransduction. Basic cell structure and cellular mechanosensors (membrane, cytoskeleton, cell-cell junction, cell-matrix adhesion). Role of RhoA/ROCK, FAK, and LINC signaling in mechanotransduction. Biomimetic substrate control of cell mechanotransduction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: MECH 934; 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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**MECH 939 Viscoelasticity****Prerequisites:** MECH 848 or MECH 910, 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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MECH 970 Advanced Manufacturing Processes****Prerequisites:** MECH 870**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**Grading Option:** Graded**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**Grading Option:** Graded**MECH 991 Seminar****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 10**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

MSYM 833 Equipment and Tractor Testing**Crosslisted with:** MSYM 433**Prerequisites:** MSYM 232; and STAT 218 or STAT 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**MSYM 836 Embedded Controls for Agricultural Applications****Crosslisted with:** AGEN 436, MSYM 436, AGEN 836**Prerequisites:** AGEN/BSEN 260 or MSYM 416**Description:** Introduction to the basics of embedded controller programming, and the development of Controller Area Network (CAN) bus systems in agricultural applications. Interfacing sensors with analog and digital signals, closed loop control of actuators, transmission and reception of CAN messages, programming of CAN messages in a distributed controller set up for sensor data acquisition, and actuator control will be studied.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**MSYM 852 Irrigation Systems Management****Crosslisted with:** MSYM 452, WATS 452, PLAS 452**Prerequisites:** MSYM 109 or PHYS 141 or PHYS 151 or PHYS 211**Notes:** PLAS/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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Prerequisite for:** AGEN 854, MSYM 854; 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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Experiential Learning:** Case Work, Project-Based Learning**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**Grading Option:** Grade Pass/No Pass Option

MSYM 869 Bio-Atmospheric Instrumentation

Crosslisted with: GEOG 469, PLAS 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

Grading Option: Grade Pass/No Pass Option

MSYM 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**MRST 896 Independent Directed Readings in Medieval and Renaissance Studies****Notes:** MRST 896 is for graduate students studying a particular MRST topic in consultation with at least one faculty member and completing the MRST minor. Courses must be approved by the MRST Director to qualify for the minor.**Description:** Engage in original research and produce an article-length paper—or equivalent substantial work as agreed upon by student and professor—to complete the course.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Graded**Offered:** FALL/SPR**Groups:** Ind Study, Special Top, Intern

Meteorology (METR)

METR 808 Microclimate: The Biological Environment**Crosslisted with:** PLAS 408, GEOG 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BSEN 954, NRES 954**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** METR 943**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** METR 943

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: METR 933

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$40

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: METR 944

Course and Laboratory Fee: \$40

Experiential Learning: Research

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

METR 850 Climate and Society

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

METR 853 GIS in Earth and Atmospheric Sciences

Crosslisted with: GEOL 453, GEOL 853, METR 453

Prerequisites: Junior or above standing; and one of the following: GEOL 100 or 101, or METR 100

Description: Basic concepts of GIS, hands-on experience with various case studies from geology, meteorology, climatology and environmental applications.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** Total Seats Needed: 150**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**METR 869 Bio-Atmospheric Instrumentation****Crosslisted with:** GEOG 469, PLAS 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**Grading Option:** Grade Pass/No Pass Option**METR 870 The Climate System: Analysis and Prediction****Crosslisted with:** METR 470**Prerequisites:** Senior standing; major or minor in meteorology.**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Research**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** METR 415, METR 815; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

METR 891 Special Topics in Meteorology-Climatology

Crosslisted with: METR 491

Description: Topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 8

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

METR 903 Seminar in Meteorology and Climatology

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

METR 908 Research Practicum

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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-genesis, 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MODL 843 Dante and His Times

Crosslisted with: MODL 443

Description: The *Divina Commedia* 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MODL 870 Introduction to Literary Theory

Description: Lecture and discussion about important figures and movements in the history of literary theory. 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MODL 891 Special Topics in Modern Languages

Crosslisted with: MODL 491

Description: Topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**MUSC 835 Music and Film: History and Analysis****Crosslisted with:** MUSC 435**Prerequisites:** MUSC 366 or EMAR 252**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**Grading Option:** Graded**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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Groups: Music History

MUSC 846 Analytic Perspectives

Crosslisted with: MUSC 446

Prerequisites: For 446: MUSC 266; For 846: Permission (granted upon satisfactory completion of Graduate Diagnostic Theory Exam or required MUSC 848 modules)

Description: Survey and application of tools to create practical analytic perspectives of sound, harmony, melody, rhythm, and form in music

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

MUSC 848B Review of Theory: Chromaticism

Description: Chromatic theory.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Grade Pass/No Pass Option

MUSC 848E Review of Theory: Form

Description: Sonata and fugue.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Groups:** Music Theory**MUSC 856 Prolongational Analysis of Tonal Music****Description:** Study of prolongation and structural counterpoint in tonal music and the hierarchical perspectives that result.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Groups:** Music History**MUSC 867 Jazz Improvisation****Crosslisted with:** MUSC 467**Prerequisites:** MUSC 465/865**Description:** Exploration of the uses 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**MUSC 875J ORGAN MUSIC >1950****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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:** 0-3**Min credits per semester:****Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**MUSC 988 Introduction to the Interdisciplinary Study of the Middle Ages****Crosslisted with:** AHIS 988, ENGL 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**MUSC 995 Graduate Conducting Project****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**MUSC 997 Doctoral Seminar****Description:** May be repeated for credit.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Music - Applied (MUAP)

MUAP 800A Voice

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 800B Keyboard

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 800D Strings

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 800E Brass

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 800G Woodwind

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 800J Percussion

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Course and Laboratory Fee: \$80

MUAP 801 Voice

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 802 Piano

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 803 Organ

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 804 Harpsichord

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 805 Violin

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 806 Viola

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 807 Cello

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 808 Double Bass

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 809 Harp

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 810 Trumpet

Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Course and Laboratory Fee: \$35

MUAP 811 French Horn

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 812 Trombone

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 813 Euphonium

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 814 Tuba

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 815 Flute

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 816 Oboe

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 817 Clarinet

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 818 Bassoon

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 819 Saxophone

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 820 Percussion

Credit Hours: 1-2

Min credits per semester: 1

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 901 Voice

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 902 Piano

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 903 Organ

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 904 Harpsichord

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 905 Violin

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 906 Viola

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 907 Cello

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 908 Double Bass

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 909 Harp

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 910 Trumpet

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 911 French Horn

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 912 Trombone

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 913 Euphonium

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 914 Tuba

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 915 Flute

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 916 Oboe

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 917 Clarinet

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 918 Bassoon

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 919 Saxophone

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 920 Percussion

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 921 Choral Conducting

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 12

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 922 Orchestral Conducting

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 12

Grading Option: Graded

Course and Laboratory Fee: \$35

MUAP 923 Wind Band Conducting**Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Course and Laboratory Fee:** \$35**MUAP 924 Guitar****Credit Hours:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 999**Grading Option:** Graded**Groups:** Applied Music**Course and Laboratory Fee:** \$35

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** MUCP 487, MUCP 887**MUCP 887 Jazz Arranging II: Large Ensembles****Crosslisted with:** MUCP 487**Prerequisites:** MUCP 486/886**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35

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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20**MUEN 843 Varsity Chorus****Notes:** Audition not required. Off-campus performance as approved by the instructor and the Director of the School of Music. Choral ensemble for tenor or bass voices.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20

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

Grading Option: Graded

Offered: FALL/SPR

MUEN 844A String 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844E Brass 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844I Clarinet Choir

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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844J Flute 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844L Trombone 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844M Horn 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

MUEN 844P Percussion 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

MUEN 844T Saxophone 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844U New Music Consort

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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844V Small Vocal 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

MUEN 844W Tuba/Euphonium 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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

MUEN 844Y Jazz Small Group

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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

MUEN 844Z Pep Band

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

Max credits per semester: 1

Max credits per degree: 4

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$20

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

MUEN 846 University Chorale

Notes: No audition required. Off-campus performances as approved by the instructor and the director of the School of Music. Choral ensemble for soprano and alto voices.

Description: Rehearsal and Performance of soprano and alto choral literature.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

Course and Laboratory Fee: \$20

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

Course and Laboratory Fee: \$20

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**Course and Laboratory Fee:** \$20

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**Grading Option:** Graded**Groups:** Opera/Music Theatre Performanc**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30

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:** 0-1**Min credits per semester:****Max credits per semester:** 1**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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 Stubley, 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**MUED 890 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**MUED 893 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Groups:** Music Education**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Groups:** Music Education**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**MUED 990 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**MUED 993 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**Groups:** Music Ensembles for Elective C

MUSR - Music-Student Recitals

MUSR 998 Graduate Recital in Applied Music**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option**NRES 804 Program Planning & Evaluation****Description:** Learn concepts from the social sciences relevant to planning and evaluating education, extension, and behavior change programs and initiatives. Learn to develop an evaluation protocol and collect data for planning and evaluating programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**NRES 805 Conservation Behavior****Description:** Learn communication and social psychology theories and techniques to improve science communication, educational programs, and environmentally responsible behavior change.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**NRES 806 Plant Ecophysiology: Theory and Practice****Crosslisted with:** AGRO 806, HORT 806, NRES 406, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**NRES 808 Microclimate: The Biological Environment****Crosslisted with:** PLAS 408, GEOG 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** BSEN 954, NRES 954**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** GEOG 422, GEOG 822; GEOG 922, NRES 922**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**NRES 815 GIS for Agriculture and Natural Resources****Crosslisted with:** NRES 415**Description:** Principles of digitizing earth observations. Manipulate spatial data, create maps, and conduct spatial analyses. Use GIS to analyze and solve real-world questions in agriculture and natural resources.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Offered:** FALL**Course and Laboratory Fee:** \$50**NRES 816A Conservation Storytelling****Description:** First in a two-part series developing narrated visual media to tell a conservation or natural resource story. Utilizes various technologies including trail cameras, time-lapse camera systems, GoPro's, traditional video and audio, as well as conventional photography and software editing programs.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** SPRING**Prerequisite for:** NRES 816B**NRES 816B Conservation Storytelling****Prerequisites:** NRES 816A**Description:** Second in a two-part series finalizing a narrated visual media project that tells a conservation or natural resource story. Utilizes various technologies including trail cameras, time-lapse camera systems, GoPro's, traditional video and audio, as well as conventional photography and software editing programs.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**NRES 817 Agroforestry Systems in Sustainable Agriculture****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**NRES 818 Introduction to Remote Sensing****Crosslisted with:** GEOG 418, GEOG 818, NRES 418**Prerequisites:** Junior Standing**Description:** Remote sensing of the earth from aerial and satellite platforms. Aerial photography, multispectral scanning, thermal imaging, microwave remote sensing techniques. Data acquisition and image analysis. Physical foundations of remote sensing using electromagnetic energy and energy-matter interactions. Applications in geographic, agricultural, environmental and natural resources analyses.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Prerequisite for:** GEOG 420, GEOG 820; GEOG 421, GEOG 821, NRES 421, NRES 821**Course and Laboratory Fee:** \$115

NRES 819 Chemistry of Natural Waters**Crosslisted with:** GEOL 418, GEOL 818, NRES 419, WATS 418**Prerequisites:** CHEM 109A/L and CHEM 110A/L, CHEM 113A/L and CHEM 114.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** GEOL 418L, GEOL 818L, NRES 419L, NRES 819L, WATS 418L**Course and Laboratory Fee:** \$25**NRES 819L Chemistry of Natural Waters Laboratory****Crosslisted with:** GEOL 418L, GEOL 818L, NRES 419L, WATS 418L**Prerequisites:** CHEM 109A and 109L and CHEM 110A and 110L or CHEM 113A and 113L and CHEM 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**Grading Option:** Grade Pass/No Pass Option**NRES 820 Applications of Remote Sensing in Agriculture and Natural Resources****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$35**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$65**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**NRES 826 Invasive Plants****Crosslisted with:** PLAS 426, AGRO 826, HORT 826, NRES 426**Prerequisites:** PLAS/SOIL 153; PLAS 131**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$65

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

NRES 829A Food Security: A Global Perspective

Crosslisted with: ANTH 429A, ANTH 829A, PLAS 429A, AGRO 829A, 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$40

NRES 835 Agroecology

Crosslisted with: PLAS 435, AGRO 835, NRES 435

Prerequisites: For PLAS/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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

NRES 838 Grassland Conservation: Planning and Management

Crosslisted with: NRES 438

Prerequisites: UG: Junior Standing; Grad: None

Notes: Recommended: introductory ecology and introductory soils courses

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$30

NRES 839 Environmental Laboratory Instrumentation and Methods

Crosslisted with: NRES 439

Prerequisites: CHEM 106A & CHEM 106L or CHEM 110A and CHEM 110L

Description: Exposure to technologies such as spectroscopy, discrete automated colorimetry, chromatography and mass spectrometry used for environmental testing. Hands-on training in calibration, operation and sample analysis, proper use of analytical balance, volumetric glassware and micropipettes, creating and maintaining a laboratory notebook, and development and understanding standard operational procedures. Advanced in-lab training in analytical laboratory techniques and operation of advanced instrumentation used in commercial and research environmental laboratories.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: FALL/SPR

NRES 840 Great Plains Ecosystem

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

Prerequisites: Junior standing.

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

NRES 842 Wildland Plants

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

Prerequisites: Junior standing.

Notes: PLAS 131 or LIFE 121 and 121L 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, forbs, shrubs, exotic and wetland plants.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: FALL

NRES 844 Ecosystem Monitoring and Assessment

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

NRES 846 Pollen Analysis for Behavioral, Biological and Forensic Science**Crosslisted with:** FORS 446, FORS 846, NRES 446**Prerequisites:** 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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Course and Laboratory Fee:** \$90**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$10**NRES 851 Soils, Water, and Environmental Chemistry****Crosslisted with:** ENVE 851, NRES 451**Prerequisites:** NRES/WATS/SOIL/PLAS/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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**NRES 852 Climate and Society****Crosslisted with:** PLAS 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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**NRES 853 Hydrology****Crosslisted with:** NRES 453**Prerequisites:** MATH 102 or above**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Graded**NRES 855 Soil Chemistry and Mineralogy****Crosslisted with:** PLAS 455, AGRO 855, NRES 455, SOIL 455**Prerequisites:** PLAS/SOIL 153 or GEOL 101; CHEM 109A/L and CHEM 110A/L; CHEM 221 or CHEM 221A & CHEM 221L or 251.**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. Forms and functions of organic matter in soil.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**NRES 857 Green Space and Urban Forestry Management****Crosslisted with:** NRES 457, PLAS 457**Prerequisites:** Junior or senior standing, Graduate student or permission**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**NRES 858 Soil Physical Determinations****Crosslisted with:** PLAS 458, AGRO 858, NRES 458, SOIL 458**Prerequisites:** SOIL/PLAS/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**Grading Option:** Grade Pass/No Pass Option**NRES 859 Limnology****Crosslisted with:** BIOS 459, BIOS 859, NRES 459, WATS 459**Prerequisites:** BIOS 207 or NRES 220; CHEM 106A & CHEM 106L or CHEM 110A & CHEM 110L**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Course and Laboratory Fee:** \$25**NRES 860 Soil Microbial Ecology****Crosslisted with:** PLAS 460, BIOS 460, NRES 460, SOIL 460, AGRO 860, BIOS 860**Prerequisites:** Senior standing.**Notes:** Recommend having a strong science background, including courses from the agronomic, environmental, microbiology, engineering or medicine disciplines.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**NRES 861 Soil Physics****Crosslisted with:** PLAS 461, GEOL 461, NRES 461, SOIL 461, WATS 461, AGRO 861, GEOL 861**Prerequisites:** PLAS/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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**NRES 863 Fisheries Science****Crosslisted with:** NRES 463**Notes:** May be offered at Cedar Point Biological Station.**Description:** Fisheries biology emphasizing the determination and evaluation of vital statistics for the management of fish populations.

Basis of specific management techniques.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**NRES 863L Fisheries Science Lab****Crosslisted with:** NRES 463L**Notes:** May be offered at Cedar Point Biological Station.**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.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** Total Seats Needed: 150**NRES 864 Fisheries Biology****Crosslisted with:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**NRES 868 Wetlands****Crosslisted with:** BIOS 458, NRES 468, WATS 468, BSEN 468, BSEN 868**Prerequisites:** CHEM 109A and 109L and CHEM 110A and 110L, or CHEM 105A and 105L and CHEM 106A and 106L; Junior or Senior Standing.**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$40**NRES 869 Bio-Atmospheric Instrumentation****Crosslisted with:** GEOG 469, PLAS 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

NRES 871 Quantitative Fishery Assessment

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

NRES 872 Applied Soil Physics

Crosslisted with: PLAS 472, AGRO 872, NRES 472, SOIL 472, WATS 472

Prerequisites: PLAS/SOIL 153; MATH 102 or MATH 104 or MATH 106.

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

Groups: CAS Diversity in the US

NRES 874 Herpetology

Crosslisted with: BIOS 474, BIOS 874, NRES 474

Prerequisites: BIOS/NRES 386 and permission.

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$90

NRES 875 Water Quality Strategy

Crosslisted with: NRES 475, SOCI 875, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$25

NRES 877 Great Plains Field Pedology

Crosslisted with: PLAS 477, GEOG 467, NRES 477, SOIL 477, GEOG 867

Prerequisites: PLAS/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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

NRES 880 Vertebrate Population Analysis

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Graded

NRES 882 Ecophysiology of Wildlife

Crosslisted with: NRES 482

Prerequisites: NRES 220 or BIOS 207; PLAS 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

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

NRES 884 Water Resources Seminar

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

NRES 885 Natural Resources Seminar

Crosslisted with: NRES 485

Description: Active listening and critical thinking activities related to seminars on current natural resources research and issues in Nebraska, the Great Plains, and throughout the world.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: FALL

NRES 886A Professional Certifications: Certified Interpretive Guide

Crosslisted with: NRES 486A

Description: Professional certification from the National Association of Interpretation. Practical skills for developing quality interpretive programs for museum, nature center, zoo and park visitors. Theoretical foundations of interpretation.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

NRES 886B Professional Certifications: Certified Interpretive Host

Crosslisted with: NRES 486B

Description: Receive professional certification from the National Association of Interpretation. Practical skills for staff and volunteers of museums, nature centers, zoos and parks to provide quality customer service.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: GEOL 470, GEOL 870; GEOL 986; NRES 918

Course and Laboratory Fee: \$10

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** NRES 464, NRES 864**Course and Laboratory Fee:** \$20**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**NRES 892 International Study Tours in Natural Resource Management****Crosslisted with:** NRES 492**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**Grading Option:** Grade Pass/No Pass Option**NRES 893 Experiences in Natural Resources****Crosslisted with:** NRES 493**Prerequisites:** Permission of instructor**Description:** Immersive learning experiences in natural resources.**Credit Hours:** 0-3**Min credits per semester:****Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**NRES 897 Master of Applied Science Project****Crosslisted with:** AGRI 897, AGRO 897, HORT 897, ASCI 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

NRES 902 Foundations of Ecological Resilience**Crosslisted with:** AGRO 902**Prerequisites:** Graduate standing**Description:** Concept of resilience, especially ecological resilience, and resilience theory. Both theoretical and applied aspects of ecological resilience, and the development of resilience theory. Prominent issues in resilience science and applications to practical problems in natural resource management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Groups:** American Government&Public Pol Biology,Psychology,& Politics**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**NRES 965 Managed Aquatic Systems****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**Grading Option:** Grade Pass/No Pass Option

NRES 985 Soil Carbon and Nitrogen Dynamics**Crosslisted with:** AGRO 985, SOIL 985**Notes:** Basic knowledge about soil biogeochemical characteristics and processes are required to take full advantage of the content delivered. Recommended courses: AGRO/SOIL 153 or AGRO 804, AGRO/SOIL 455/855, GEOL 417/817.**Description:** Understand carbon and nitrogen cycling in the soil ecosystem including feedbacks and implications for soil management, environment, and climate.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL/SPR**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**NUTR 829A Food Security: A Global Perspective****Crosslisted with:** ANTH 429A, ANTH 829A, PLAS 429A, AGRO 829A, 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**NUTR 856 Clinical Exercise Physiology****Crosslisted with:** NUTR 456**Prerequisites:** NUTR 486/886 or equivalent.**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

NUTR 871 Vines, Wines and You

Crosslisted with: PLAS 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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$95

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: NUTR 973

NUTR 875 Applied Dietetic Practice and Concepts

Description: Applied professional dietetic practice concepts addressing specific accreditation required competencies and performance indicators through the completion of didactic components and professional practicum supervised learning experiences.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 5

Grading Option: Graded

Offered: FALL

Course and Laboratory Fee: \$15

NUTR 880 Introduction to Functional Electrocardiography

Crosslisted with: NUTR 480

Prerequisites: NUTR 486; NUTR 484

Description: Theory and application of electrocardiography in graded exercise testing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

NUTR 884 Physiology of Exercise

Crosslisted with: NUTR 484

Prerequisites: BIOS 213 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

Grading Option: Graded

Prerequisite for: NUTR 486, NUTR 886; NUTR 488; NUTR 858

Course and Laboratory Fee: \$45

NUTR 886 Exercise Testing and Exercise Programming in Adult Fitness and Cardiac Rehabilitation

Crosslisted with: NUTR 486

Prerequisites: NUTR 484; EDPS 459 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

Grading Option: Graded

Prerequisite for: NUTR 456, NUTR 856

Course and Laboratory Fee: \$40

Experiential Learning: Other

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

Grading Option: Grade Pass/No Pass Option

NUTR 893 Oral Science Communication Strategies

Description: Research and develop evidence-based, audience-centered presentation content and apply oral communication strategies to deliver presentations with memorable messaging.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 2

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

NUTR 894 Essentials of Strength Training & Conditioning

Crosslisted with: NUTR 494

Prerequisites: Junior Standing

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

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

Grading Option: Graded

NUTR 920 Teaching Seminar and Practicum

Crosslisted with: CYAF 920, TMFD 920

Description: Supervised classroom experiences designed to develop competencies in teaching at the college level.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

NUTR 945 Complications of Maternal Obesity

Crosslisted with: ASCI 945

Description: Introduction to overnutrition and its complications during maternal obesity and metabolic syndrome.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

NUTR 949 Biochemistry of Nutrition

Crosslisted with: ASCI 949, BIOC 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: ASCI 925, NUTR 925; ASCI 926, NUTR 926; ASCI 927, NUTR 927

NUTR 952 Applied Medical Nutrition Therapy I

Description: Pathophysiology of disease and the application of nutrition in prevention, etiology, and treatment of disease. Critical review of the nutrition literature to inform practice related to both acute and chronic diseases. Overview of the nutrition care process, nutrition assessment, and common chronic diseases.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

NUTR 955 Applied Medical Nutrition Therapy II

Description: Pathophysiology of disease and the application of nutrition in prevention, etiology, and treatment of disease. Critical review of the nutrition literature to inform practice related to nutrition care of complex conditions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

NUTR 975 Supervised Experiential Practicum

Description: Supervised hands-on training in professional work settings for registered dietitian nutritionists in the areas of food service management, community nutrition and medical nutrition therapy.

Credit Hours: 1-15

Min credits per semester: 1

Max credits per semester: 15

Max credits per degree: 15

Grading Option: Graded

Offered: FALL/SPR

Course and Laboratory Fee: \$50

NUTR 976 Organization and Management in Community Nutrition and Health Promotion

Description: Examination of the philosophical, theoretical, and epidemiological assumptions underlying the planning, implementation, and evaluation of community and workplace health promotion programs. Development of skills and competencies for evidence-informed development of these programs.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

NUTR 990 Nutrition and Health Sciences Seminar

Description: Presentation and discussion of topics and research, by faculty, graduate students, and guest speakers, related to areas of expertise within Nutrition and Health Sciences

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 811 Formal Logic****Crosslisted with:** PHIL 411**Prerequisites:** PHIL 211 or MATH 310 or MATH 325 or CSCE 235.**Notes:** Second course in symbolic logic.

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 817 Philosophy of Science****Crosslisted with:** PHIL 417**Prerequisites:** 3 hours PHIL or graduate standing

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 sciences, the structure of scientific theories, the ontological status of theoretical entities, the reduction of scientific theories, and the confirmation of scientific hypotheses.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 822 Why Be Moral?****Crosslisted with:** PHIL 422**Prerequisites:** 9 credit hours in PHIL

Description: Explore the foundations of ethics with consideration of major historical and contemporary views about the source of ethical obligation, practical normativity and morality.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

PHIL 824 Philosophy of Action**Crosslisted with:** PHIL 424**Prerequisites:** 9 hours PHIL.**Description:** Foundational issues in human action, including the nature of intentional action, practical reasoning, moral responsibility, group agency, and various forms of irrationality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 830 Modern Legal Philosophy****Crosslisted with:** PHIL 430**Description:** Examination of classic books of 20th century jurisprudence.

Topics include the relationship between law and morality and the development of legal positivism and its critics.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 880 German Idealism****Crosslisted with:** PHIL 480**Prerequisites:** 9 hours PHIL**Description:** Survey of "Classical" German Idealism. Figures discussed include Kant, Jacobi, Reinhold, Schulze, Fichte, Schelling, and Hegel. Focus on four lines of thought prominent in German Idealism-viz. Spinozism, skepticism, self-consciousness, and the relationship between the senses and the intellect.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**PHIL 886 Philosophical Themes****Crosslisted with:** PHIL 486**Prerequisites:** Permission.**Description:** Independent and significant research project.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 903 Philosophy of Mathematics****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 905 Philosophy of Language****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 911 Topics in Logic****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 913 Advanced Epistemology****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option

PHIL 914 Philosophy of Mind**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**PHIL 915 Advanced Metaphysics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**PHIL 917 Philosophy of Science****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 920 Ethical Theory****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 923 Philosophy of Psychology****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 952 Greek Philosophy****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 955 Empiricism****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 960 Rationalism****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**PHIL 971 Kant****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PHIL 998 Dissertation Seminar****Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 24**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

Physics (PHYS)

PHYS 801 Computational Physics**Crosslisted with:** PHYS 401**Prerequisites:** A grade of P, C or better in PHYS 311.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: PHYS 442, PHYS 842

Course and Laboratory Fee: \$55

PHYS 842 Experimental Physics II

Crosslisted with: PHYS 442

Prerequisites: PHYS 441/841 or permission

Notes: Lab fee required.

Description: Continuation of PHYS 441/841.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Prerequisite for: PHYS 443, PHYS 843

Course and Laboratory Fee: \$55

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$55

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

Grading Option: Grade Pass/No Pass Option

PHYS 852 Optics and Electromagnetic Waves

Crosslisted with: PHYS 452

Prerequisites: A grade of P, C or better in 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

Grading Option: Grade Pass/No Pass Option

PHYS 861 Quantum Mechanics

Crosslisted with: PHYS 461

Prerequisites: A grade of P, C or better in PHYS 213 and 311.

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

Grading Option: Grade Pass/No Pass Option

PHYS 862 Atoms, Nuclei, and Elementary Particles

Crosslisted with: PHYS 462

Prerequisites: A grade of P, C or better in PHYS 461

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

PHYS 892 Special Topics in Physics**Crosslisted with:** PHYS 492**Prerequisites:** PHYS 213 and permission.**Description:** Topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 912; PHYS 928**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 927**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 914; PHYS 918; PHYS 928**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 928**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 912; PHYS 917; PHYS 925; PHYS 927**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PHYS 918; PHYS 926**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**PHYS 955 Advanced Topics in Atomic Physics****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**PHYS 996 Research Other Than Thesis****Description:** Research leading to PhD**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 18**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PLPT 866; 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PLPT 866; 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**Grading Option:** Grade Pass/No Pass Option**PLPT 814 Turfgrass Disease Management****Crosslisted with:** AGRO 814, HORT 814, PLPT 414, PLAS 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**Grading Option:** Grade Pass/No Pass Option

PLPT 815 Corn Diseases**Crosslisted with:** PLPT 415**Prerequisites:** PLPT 210 or PLPT 369 or equivalent**Notes:** Taught online only. This is an 8-week mini-course.**Description:** Introduction to the important diseases affecting corn (maize) in Nebraska and other areas of the United States. Pathogen biology, favorable conditions, disease diagnosis based on symptomatology and management strategies are emphasized**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**PLPT 818 Microbial Genetics & Genomics****Crosslisted with:** PLPT 418, MBIO 418**Prerequisites:** BIOS 206 or PLAS 215.**Notes:** BIOS 312 recommended.**Description:** Inheritance, exchange, and regulation of genes in prokaryotic microorganisms: gene structure and function; gene transfer and the elements (plasmids, phages, and transposons) involved; DNA mutations, repair, and genetic analysis; genome sequencing, microbial genome databases, and global gene expression analysis.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**PLPT 899 Masters Thesis****Prerequisites:** Admission to masters degree program and permission of major advisor.**Description:** Research and writing towards the master's thesis**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Grading Option:** Pass No-Pass**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING

PLPT 999 Doctoral Dissertation

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

Description: Research and writing towards the PhD dissertation

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Grading Option: Pass No-Pass

Political Science (POLS)

POLS 800 Research Methods

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**POLS 866 Pro-seminar in International Relations I****Crosslisted with:** ECON 466, POLS 466, AECN 467, ECON 866, HIST 479, HIST 879**Prerequisites:** Senior standing and permission.**Notes:** Open to students with an interest in international relations.**Description:** Topic varies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**POLS 875 Water Quality Strategy****Crosslisted with:** NRES 475, NRES 875, SOCI 475, SOCI 875, SOIL 475, WATS 475, PLAS 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**Grading Option:** Grade Pass/No Pass Option

POLS 876 Ethnic Conflict and Identity**Crosslisted with:** JUDDS 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**Grading Option:** Grade Pass/No Pass Option**POLS 877 Israel and the Middle East****Crosslisted with:** JUDDS 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**Grading Option:** Grade Pass/No Pass Option**POLS 878 Pro-seminar in Latin American Studies****Crosslisted with:** HIST 478, POLS 478, EDPS 478, HIST 878, EDPS 878**Prerequisites:** Junior standing and permission.**Description:** An interdisciplinary analysis of topical issues in Latin American Studies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**POLS 892 Special Topics in Political Science****Crosslisted with:** POLS 492**Description:** Topics vary.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**POLS 901 Dissertation Prospectus****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**POLS 920 Seminar in American Government****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**POLS 931 Seminar in Public Policy****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**POLS 941 Seminar in Methods****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

POLS 960 Seminar in International Relations**Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**POLS 979 Research Seminar in Comparative Politics****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**PSYC 828 Health Psychology****Crosslisted with:** PSYC 428**Prerequisites:** Junior or Senior 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**Grading Option:** Grade Pass/No Pass Option**PSYC 840 Controversial Issues 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**Course and Laboratory Fee:** \$15**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**Grading Option:** Graded**Course and Laboratory Fee:** \$15

PSYC 858 Behavior Genetics**Crosslisted with:** PSYC 458**Prerequisites:** PSYC 273**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PSYC 861 Animal Learning & Cognition****Crosslisted with:** PSYC 461**Prerequisites:** Junior or Senior standing**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**Grading Option:** Grade Pass/No Pass Option**PSYC 862 Motivation and Emotion****Crosslisted with:** PSYC 462**Prerequisites:** Junior or Senior 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**Grading Option:** Grade Pass/No Pass Option**PSYC 864 Psychoneuropharmacology****Crosslisted with:** PSYC 464**Prerequisites:** PSYC 273 or PSYC 368**Description:** Understanding behavioral and psychological phenomena using pharmacological tools. Topics from neurobiology of receptor functioning to the concerted actions of neural mechanisms that are believed to produce such phenomena as fear and anxiety, substance abuse, and neurological disorders.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**PSYC 865 Behavioral Neuroscience****Crosslisted with:** BIOS 465, BIOS 865, PSYC 465**Prerequisites:** PSYC 273**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**Grading Option:** Grade Pass/No Pass Option**PSYC 871 Human Sexuality and Society****Crosslisted with:** CYAF 471, EDPS 471, PSYC 471, SOCI 471, CYAF 871, EDPS 871, SOCI 871**Prerequisites:** Junior or Senior 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

PSYC 902A Developmental: Biological and Cognitive Development

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 902B Developmental: Social and Personality Development

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 904 Proseminar in Physiological

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 906 Proseminar in Social Psychology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 907 Proseminar in Cognitive Psychology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 908 Proseminar in Clinical-Community

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 909 Proseminar in Psychopathology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 910 Proseminar in History and Philosophy of Psychology

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

PSYC 912A Fundamentals of Neuroscience and Behavior Part 1

Notes: This is the first part of a year-long course that will be offered in the fall of alternating years.

Description: Introduction to fundamental concepts and methods used in neuroscience and behavior research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Pass No-Pass

Offered: FALL

PSYC 912B Fundamentals of Neuroscience and Behavior Part 2

Notes: This is the second part of a year-long course that will be offered in the spring of alternating years.

Description: Continuation of PSYC 912A.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Pass No-Pass

Offered: SPRING

PSYC 913 Professionalism and Ethics in Neuroscience and Behavior

Description: Introduction to professionalism and ethics relevant to neuroscience and behavior, as well as other fields of psychology. Topics include open science, writing, presenting, applying for jobs, neuroethics, human/animal research, and data integrity.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No-Pass

Offered: FALL

PSYC 914 Diversity and Equity in Neuroscience and Behavior Research

Description: Introduction key models of diversity in the conduct of neuroscience and behavior science. Emphasis on building practical skills related to creating inclusive mindsets as scientists, educators, mentors, and collaborators.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Pass No-Pass

Offered: SPRING

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**Prerequisite for:** PSYC 925B**PSYC 925A Ethics for Clinical Psychologists****Prerequisites:** Advanced graduate standing and permission**Description:** Application of ethical principles to practice 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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**PSYC 931 Quantitative Methods for the Behavioral Sciences I****Prerequisites:** Graduate standing**Description:** This is the first in a two-course sequence on quantitative methods for the behavioral sciences. Topics include the fundamentals of statistics (measure of central tendency, variability, normal distribution, probability theory), hypothesis testing (type I and II error, one-tailed vs. two-tailed tests, and statistical power), t-tests (degrees of freedom, the t distribution, hypothesis testing with the t statistic), and Analysis of Variance (the F-ratio, post hoc testing, analysis of covariance, and factorial ANOVA).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Prerequisite for:** PSYC 932**PSYC 932 Quantitative Methods for the Behavioral Sciences II****Prerequisites:** Graduate standing and completion of Psyc 931**Description:** This is the second in a two-course sequence on quantitative methods for the behavioral sciences. Topics include correlation (sum of products of deviations, calculation of the Pearson correlation, and the Pearson correlation and z-scores) and regression models (multiple regression, variable transformations, categorical predictors, logistic regression, polynomial regression, and interactions and moderation).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PSYC 942; PSYC 944; PSYC 948

PSYC 942 Fundamentals of Research Design and Data Analysis 2**Prerequisites:** PSYC 941**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Prerequisite for:** PSYC 944; PSYC 948**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**PSYC 947 Questionnaire Design****Crosslisted with:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**PSYC 949 Longitudinal Structural Equation Modeling****Prerequisites:** PSYC 941, PSYC 942, & PSYC 948 (or equivalent) and instructor permission**Description:** Applications of structural equation models to longitudinal designs for analyzing repeated measures data. Topics will include evaluation of measurement invariance, panel models, latent growth curve models, and other extensions of structural equation models for longitudinal data.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PSYC 956; PSYC 957**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** PSYC 957**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: PSYC 990

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

Prerequisite for: PSYC 982

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

PSYC 995 Psycholegal Research Other than Thesis I

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

Grading Option: Grade Pass/No Pass Option

Offered: ALL

PSYC 995A Psycholegal Research Other than Thesis II

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Russian (RUSS)

RUSS 803 Russian Grammar and Stylistics

Crosslisted with: RUSS 403

Prerequisites: RUSS 301, 302, 303 or 304

Notes: See instructor if you believe an equivalent course(s) may count for prerequisite.

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**RUSS 883 Russian Secular and Political Folklore****Crosslisted with:** RUSS 483**Prerequisites:** Junior standing.**Description:** Introduction to the Russian folklore and examination of a variety of genres, including folk mythology and demonology, fairy tales, historical songs, rituals, political mythology, etc. Focus is on the study of the appropriation of folklore in literature, film, political ideologies, and visual arts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL/SPR**RUSS 898 Special Topics in Russian****Prerequisites:** RUSS 301 and 302.**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:** 1-4**Min credits per semester:** 1**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

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**Grading Option:** Grade Pass/No Pass Option**SOCL 811 Sociology of Sexualities****Crosslisted with:** SOCL 411**Prerequisites:** Junior or Senior standing**Notes:** Requires advanced permission before registering for the course.**Description:** Examination of theoretical and empirical approaches to sexual identities, differences, practices and desires. Focus on power, social control and morality.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SOCI 812 Religion, Gender, and Sexuality

Crosslisted with: SOCI 412, WMNS 412, WMNS 812

Prerequisites: Junior or Senior standing

Description: Examination of how religion is used to shape, maintain, and transform gender and sexuality in the U.S. and beyond. Focus on the intersection of religion, gender, and sexuality from a feminist/queer theoretical perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SOCI 830 Advanced Social Network Analysis

Crosslisted with: SOCI 430

Prerequisites: Junior or Senior standing

Description: Introduction to the theoretical, methodological and substantive underpinnings of social network analysis. Focuses on the theoretical/conceptual ideas at the heart of the network approach, how to analyze and interpret network data, and how to apply network ideas and methods to social problems.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SOCI 835 Mass Communication

Crosslisted with: SOCI 435

Prerequisites: 9 hours of SOCI, 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

Grading Option: Grade Pass/No Pass Option

SOCI 842 Personality and Social Structure

Crosslisted with: SOCI 442

Prerequisites: 9 hours of SOCI, or Senior standing.

Description: Personality and the sociocultural environment.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SOCI 862 Basic Regression Analysis****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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**SOCI 865 Survey Design and Analysis****Crosslisted with:** SOCI 465**Prerequisites:** Junior or Senior Standing, or Sociology Major**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SOCI 871 Human Sexuality and Society****Crosslisted with:** CYAF 471, EDPS 471, PSYC 471, SOCI 471, CYAF 871, EDPS 871, PSYC 871**Prerequisites:** Junior or Senior 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**Grading Option:** Grade Pass/No Pass Option**SOCI 874 Deviance and Social Control****Crosslisted with:** SOCI 474**Prerequisites:** Junior or Senior standing**Description:** Explores conformity and deviance within and across social groups by examining theory and empirical research. It reviews current thinking on the nature (and sources) of social control that is exerted by group. Topics include: Socialization into the norms and narratives that define groups, benefits/disadvantages of group membership, and (threat of) sanctions, including exclusion from the group.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SOCI 875 Water Quality Strategy

Crosslisted with: NRES 475, NRES 875, SOCI 475, SOIL 475, WATS 475, PLAS 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

SOCI 882 Sociology of Leadership

Crosslisted with: SOCI 482

Prerequisites: Junior or Senior standing, or Sociology Major

Description: Sociological perspectives on leadership and its multiple dimensions related to individuals, group dynamics, social structures, and contextual factors.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SOCI 883 Political Sociology

Crosslisted with: SOCI 483

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

Grading Option: Grade Pass/No Pass Option

SOCI 885 Agent-Based Social Simulation

Crosslisted with: SOCI 485

Prerequisites: Junior or Senior standing; SOCI 206, STAT 218, ECON 215, PSYC 350, or EDPS 459

Description: Focus on how agent-based modeling and computer simulation can be used to test hypotheses about the impact of individual-level behavior on systemic patterns and changes. Extensive use of simulations, experiments, coding experiences with applications for sociological research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SOCI 886 Sociology of Gender

Crosslisted with: SOCI 486, WMNS 486, WMNS 886

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

Grading Option: Grade Pass/No Pass Option

SOCI 892 Special Topics in Sociology

Crosslisted with: SOCI 492

Description: Topics vary.

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

SOCI 901 Seminar in Sociological Theory

Prerequisites: Permission

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Grading Option: Grade Pass/No Pass Option

SOCI 902 Seminar in Research Methods**Prerequisites:** Permission**Description:** Advanced topics related to sampling error in surveys**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 903 Seminar in Health****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 904 Seminar in Family****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 905 Seminar in Stratification, Class, and Inequality****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 906 Seminar in Race and Ethnicity****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 907 Seminar in Sex and Gender****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SOCI 947 Questionnaire Design****Crosslisted with:** PSYC 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**Grading Option:** Grade Pass/No Pass Option**SOCI 995 Seminar in Professional Development****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 3**Grading Option:** Pass No-Pass**SOCI 995A Teaching****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**SOCI 995B Graduate Study and Career Research****Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**SOCI 995D Publications Seminar****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**SOCI 998 Special Topics Seminar****Prerequisites:** Permission**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

SPAN 807 History of the Spanish Language**Crosslisted with:** SPAN 407**Prerequisites:** SPAN 317 or SPAN 319**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**Grading Option:** Grade Pass/No Pass Option**SPAN 821 Medieval Literature****Crosslisted with:** SPAN 421**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 832 Spanish Speaking Proficiency and Pedagogy****Crosslisted with:** SPAN 432**Prerequisites:** SPAN 303 or SPAN 304 or SPAN 300A**Description:** Development of spoken Spanish alongside analysis of grammar points known to be challenging for native speakers of English to acquire. Graduate level includes a review of pedagogical theory, research and methodology pertaining to classroom instruction of Spanish as a second language.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 841 Golden Age Poetry****Crosslisted with:** SPAN 441**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 842 Golden Age Prose****Crosslisted with:** SPAN 442**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 845 Golden Age Drama****Crosslisted with:** SPAN 445**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 853 Nineteenth-Century Spanish Literature****Crosslisted with:** SPAN 453**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 854 Gender and Sexuality in Spain****Crosslisted with:** SPAN 454, WMNS 454, WMNS 854**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Analysis of gender and sexuality in the culture and literature of Spain, covering topics related to women's studies, masculinities and LGBTQ+ issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**SPAN 855 Human Rights in Latin America****Crosslisted with:** SPAN 455**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or 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**Grading Option:** Grade Pass/No Pass Option**SPAN 856 Twentieth and Twenty-first Century Spanish Poetry****Crosslisted with:** SPAN 456**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Reading and analysis of Spanish poetry, with emphasis on A. Machado, F. García Lorca, E. Champourcin, G. Celaya, and G. Fuertes.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SPAN 857 Twentieth and Twenty-first Century Spanish Narrative**Crosslisted with:** SPAN 457**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Reading and analysis of significant Spanish narratives.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 858 Twentieth and Twenty-first Century Spanish Drama****Crosslisted with:** SPAN 458**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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**Grading Option:** Grade Pass/No Pass Option**SPAN 859 Spanish-American Poetry****Crosslisted with:** LAMS 459, SPAN 459**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Spanish-American poetry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 860 Spanish-American Novel****Crosslisted with:** LAMS 460, SPAN 460**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Spanish-American novels.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 861 History and Fiction in Latin America****Crosslisted with:** SPAN 461**Prerequisites:** SPAN 321 or 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Analysis of the relationships between history and fiction in Latin American literature, movies and/or other cultural artifacts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 862 Spanish-American Short Story****Crosslisted with:** LAMS 462, SPAN 462**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**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, Maria Luisa Bombal, Juan Rulfo, Julio Cortazar, Rosario Castellanos, and Luisa Valenzuela.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 863 Twentieth and Twenty-first Century Spanish and Spanish-American Essay****Crosslisted with:** SPAN 463**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, 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**Grading Option:** Grade Pass/No Pass Option**SPAN 865 Caribbean Literature and Culture****Crosslisted with:** SPAN 465**Prerequisites:** SPAN 321 or 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Explore some of the great leitmotifs that have shaped the cultural production of the Spanish speaking Caribbean and the Caribbean diasporas in the U.S. Topics include colonial and postcolonial exploitation, race and transculturation, displacement and migration, environmental issues and natural disasters, among others.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 870 Feminisms in Latin America****Crosslisted with:** LAMS 470, SPAN 470, WMNS 470, WMNS 870**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Examination of a variety of feminist Latin American texts including poetry, fiction, history, philosophy and political manifestos from a cultural and literary studies perspective. Consideration of pop culture and visual artists.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 873 Don Quixote and the Birth of the Modern Novel****Crosslisted with:** SPAN 473**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Examination of Cervantes' 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

SPAN 876 Exile and Migration**Crosslisted with:** SPAN 476**Prerequisites:** SPAN 321 or SPAN 331, and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Analysis of exile and migration in Spain and/or Latin America, covering topics such as memory, political and national ideology, work, gender and sexuality, and the second generation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 878 Introduction to the Digital Analysis of Hispanic Culture****Crosslisted with:** SPAN 478**Prerequisites:** SPAN 305 or SPAN 306; 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**Grading Option:** Grade Pass/No Pass Option**SPAN 886 Spanish in the United States: Variation and Contact****Crosslisted with:** SPAN 486**Prerequisites:** SPAN 303 or SPAN 304 or SPAN 300A**Description:** Approximation to the linguistic and social diversity of Spanish-speaking communities in the United States. Examination of issues of linguistic contact, bilingualism, language ideologies, linguistic maintenance/shift, and linguistic policies from a sociolinguistic perspective.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**SPAN 888 Heritage Speaker Pedagogy****Crosslisted with:** SPAN 488**Prerequisites:** SPAN 303 or SPAN 304 or SPAN 300A**Description:** Introduction to the theoretical framework and classroom methodology for the teaching of Spanish to bilingual students who acquired the language at home. Exploration of differences between bilingual, monolingual, and second language acquisition of Spanish.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 891 Special Topics in Spanish****Crosslisted with:** SPAN 491**Description:** Language, literature, and civilization.**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**SPAN 896 Independent Study in Spanish****Crosslisted with:** SPAN 496**Prerequisites:** Permission.**Description:** Independent reading or research under direction by a faculty member.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SPAN 922A Teaching for Intercultural Communicative Competence in the Spanish Language Classroom****Crosslisted with:** TEAC 922A**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching culture and intercultural communicative competence in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 922B The Interpretive Mode: Reading and Listening in the Spanish Language Classroom****Crosslisted with:** TEAC 922B**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching reading, listening and viewing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SPAN 922F Interpersonal and Presentational Writing in the Spanish Language Classroom**Crosslisted with:** TEAC 922F**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching writing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 922K Interpersonal and Presentational Speaking in the Spanish Language Classroom****Crosslisted with:** TEAC 922K**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching both interpersonal and presentational speaking with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 922O Assessment in the Spanish Language Classroom****Crosslisted with:** TEAC 922O**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores the fundamental concepts and principles of assessment in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 922S Planning in the Spanish Language Classroom****Crosslisted with:** TEAC 922S**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of instructional planning strategies for the purposes of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 922W Technology-Enhanced Spanish Language Instruction****Crosslisted with:** TEAC 922W**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of technology tools for foreign language with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 925 Spanish Modernism****Description:** Analysis of the culture and literature of Spanish Modernism, from 1898 to 1936.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 942 Golden Age****Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**SPAN 943 Colonial Spanish America****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SPAN 953 The Spanish Civil War and Francoism****Description:** Study of the Spanish Civil War and Francoism, focusing on the history, ideology and cultural production during those years, as well as the presence of the war and dictatorship through historical memory until present times.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

SPAN 955 Avant-Garde and Postmodernism

Description: Dedicated to avant-garde and/or postmodern literature and art in the Hispanic world. Covers both artistic movements, or focus on one of them.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

SPAN 991 Special Topics

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 24

Grading Option: Grade Pass/No Pass Option

SPAN 993 Contemporary Spanish America

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Special Education (SPED)

SPED 801A Accommodating Exceptional Learners in the Elementary School Classroom

Crosslisted with: SPED 401A

Prerequisites: Admission to the Teacher Education program. Co-enrollment in TEAC 308 or 311.

Notes: Must be taken concurrently with a practicum course

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

Grading Option: Grade Pass/No Pass Option

SPED 801B Accommodating Exceptional Learners in the Secondary School Classroom

Crosslisted with: SPED 401B

Prerequisites: Admission to the Teacher Education program.

Notes: Must be taken concurrently with a practicum course.

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

Grading Option: Grade Pass/No Pass Option

SPED 803 Executive Function

Prerequisites: Admission to graduate degree program at UNL or permission of instructor

Description: Theories of executive function (EF) and its development. Links between EF and developmental outcomes. Executive function in special populations. Considerations for including executive function in educational and psychological research.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SPED 804 Advanced Research in Math Learning Difficulties

Description: Historical perspectives, theories, and models of mathematics learning and mathematics learning disabilities. Cognitive and academic profiles of students with mathematics learning disabilities. Cognitive factors that impact mathematics learning. Considerations for cognition to develop effective mathematics intervention.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SPED 805 Systematic Review**Crosslisted with:** SLPA 805**Prerequisites:** Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major**Description:** Introduction to research in special education and related paradigms in order to conduct and write a systematic literature review. Includes instruction in conducting database searches and finding relevant literature, methods for evaluating the quality of evidence for effectiveness, developing codebooks and training for reliability, and writing in APA style.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Graded**SPED 808 Methods and Instruction for Secondary Special Education****Crosslisted with:** SPED 408**Notes:** This course is taken concurrently with a practicum experience.**Description:** Principles of Classroom Instruction That Works and Explicit Instruction are instilled as a framework for instructional planning at the secondary level. Co-teaching with content teachers and transitional planning for secondary students with disabilities will also be addressed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**SPED 809 Intro to Autism Spectrum Disorder****Description:** Designed for educators of children and youth with Autism Spectrum Disorder. Provides characteristics, assessment process, and etiology. Includes overview of interventions and evidence-based practices.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** SPED 810**SPED 810 Autism Spectrum Disorder (ASD): Methods****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 intervention programs for individuals with Autism Spectrum Disorder. Apply assessment data to develop functional outcomes and select instructional strategies using evidence-based interventions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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:** 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**Grading Option:** Graded**Prerequisite for:** SPED 415, SPED 815; SPED 415A, SPED 815A**Course and Laboratory Fee:** \$15**SPED 824 Functional Behavioral Assessment****Prerequisites:** SPED 454 or equivalent. Admission to Graduate Degree or Certificate program in Special Education.**Description:** Functional behavioral assessments and development of behavior intervention plans 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** SPED 942**SPED 846 Visual Impairments: Characteristics****Prerequisites:** Admission to Graduate Degree or Certificate program in Special Education.**Description:** An introduction to current educational programs and services for children with visual impairments, including children with additional disabilities. Topics include the history of educational services for this population, developmental characteristics, psychosocial aspects, and current and past legislation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** SPED 847; SPED 849; SPED 852; SPED 852A; SPED 852B; SPED 853**SPED 847 Etiologies 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 affect 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. Conducting Functional Vision Assessments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** SPED 852B**SPED 848 Foundation of Orientation and Mobility I****Description:** Provide an overview of the profession of orientation and mobility including key figures, organizations, and the overall development of the field as well as kinesiology and sensorimotor functioning, psychosocial aspects of O&M, environmental accessibility, and research.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**SPED 849 Braille I****Prerequisites:** SPED 846 or by permission of instructor**Description:** Basic skills in Unified English Braille. Acquire competence in reading and writing braille and using the Perkins braillewriter and slate/stylus.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Prerequisite for:** SPED 851; SPED 852B**SPED 850 Foundation of Orientation and Mobility II****Description:** Provide essential practical and instructional knowledge essential for all orientation and mobility specialists, use of senses and the psychosocial aspects of orientation and mobility, information on age-related instruction and instruction with individuals who have additional disabilities, and adapted orientation and mobility tools and working in complex environments.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**SPED 851 Braille II****Prerequisites:** SPED 849 or permission of instructor.**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** SPED 852B

SPED 852 Visual Impairments: Methods**Prerequisites:** SPED 846 or permission of instructor**Description:** Methods and materials for educating children who are totally blind or have low vision, including students with multiple impairments.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Prerequisite for:** SPED 852B**SPED 852A Applied Technology Methods for Students with Visual Impairments****Prerequisites:** SPED 846**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SPED 853 Orientation and Mobility I****Prerequisites:** SPED 846. Admission to Graduate Degree or Certificate program in Special Education or permission of instructor.**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**Grading Option:** Grade Pass/No Pass Option**SPED 854 Basic Skills: Orientation & Mobility****Notes:** Students will be expected to travel around the community to practice and demonstrate competency of performing and teaching travel techniques.**Description:** Acquisition of instructional strategies for teaching orientation and mobility to students with visual impairments; application of knowledge through performance-based activities, including blindfold and vision simulator.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SUMMER**Prerequisite for:** SPED 864**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**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**Grading Option:** Grade Pass/No Pass Option**SPED 859 Assessment and Professional Issues in Orientation & Mobility****Description:** Overall philosophy of orientation and mobility (O&M), including Code of Ethics and Certification standards; discuss current literature and issues impacting programming and students with multiple disabilities; development and administration of an effective O&M instructional program; and O&M assessment procedures.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**SPED 860 Issues in Early Childhood Special Education****Notes:** Prior course in early childhood education or introduction to special education course (SPED 201)**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

SPED 862 Preschool Children with Disabilities

Prerequisites: An assessment and applied behavior analysis course; Admission to Graduate Degree or Certificate program in Special Education or permission of instructor.

Notes: SPED 862 requires an applied experience.

Description: Selection, design and implementation of developmentally appropriate, classroom-based interventions for young children with disabilities. Ecological assessments; activity and instructional planning; selection and use evidence-based strategies; consultation practices for inclusive settings.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

SPED 863 Medically Fragile infants

Prerequisites: Admission to a graduate degree or certificate program in Special education, Speech-Language Pathology, or Child, Youth and Family Studies. Or by permission of instructor.

Notes: Prior coursework or experiences with children with disabilities advised.

Description: Understanding and design of developmental care and learning opportunities for children with complications of prematurity and extended hospital stays. Neonatal and postnatal development as well as common conditions associated with low birth weight and prematurity are reviewed. Assessment and supports considered in contexts of hospital, family home and community care settings for young children with special health care needs who are at risk for or show developmental disabilities.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

SPED 864 Advanced Skills: Orientation & Mobility

Prerequisites: SPED 854

Notes: Students will be expected to travel around the community to practice and demonstrate competency of performing and teaching travel techniques.

Description: Acquisition of advanced instructional strategies for teaching orientation and mobility to students with visual impairments; application of advanced knowledge through performance-based activities, including blindfold and vision simulator.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SUMMER

SPED 872 Deaf or Hard of Hearing: Characteristics

Prerequisites: Admission to Graduate Degree or Certificate program in Special Education or permission of instructor.

Description: Education of students who are deaf or hard of hearing, including history, definitions, etiology, identification, assessment, professional roles, and educational programming. Examine attitudes, assumptions, and stereotypes of persons who are deaf or hard of hearing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: SPED 873; SPED 874; SPED 875

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

SPED 875 Sensory Disabilities: Itinerant Teaching

Prerequisites: SPED 872 or parallel with SPED 875. Admission to Graduate Degree or Certificate program in Special Education or permission of instructor.

Description: Methods for providing services for students who are visually impaired and/or deaf or hard of hearing, using itinerant and consultative models. Professional and parent in-service development, team-based problem solving, curriculum based pull-out services. Ecological assessment; technologies; and use of interpreters and paraprofessionals.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SPED 876 Language Development for Teachers

Description: Foundations of normal speech and language development and potential difficulties in early stages of communication and later classroom success. 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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: SLPA 884, SPED 884

SPED 877 Sensory Disabilities: Itinerant Teaching Methods

Crosslisted with: SLPA 877

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.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SUMMER

SPED 880 Educating Students with Intellectual and Developmental Disabilities

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL/SPR

SPED 882 Severe Multiple Disabilities: Methods

Prerequisites: Admission to Graduate Degree or Certificate program in Special Education or by permission of instructor.

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

Grading Option: Graded

Course and Laboratory Fee: \$10

SPED 884 Deaf or Hard of Hearing: Speech & Language Issues

Crosslisted with: SLPA 884

Prerequisites: SPED 876 or equivalent. Admission to Graduate Degree or Certificate program in Special Education or by permission of instructor.

Description: Theories of speech and language development, evaluation, and intervention programming for children who are deaf or hard of hearing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$15

SPED 890 Special Topics

Prerequisites: Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major.

Description: An in-depth study of professionally-relevant topic(s).

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Graded**SPED 894 Independent Study****Crosslisted with:** SLPA 494, SLPA 894, SPED 494**Prerequisites:** Prior arrangements with faculty member and permission.**Description:** Individual or group projects that are extensions of course work, such as preparation of teaching materials, review of literature, observation/exploration of practices, design of curricular or clinical tools. Topic, scope and grading parameters are under guidance of a department faculty member, but topic can be student-initiated. These projects are generally relevant to the student's professional practice and advance the student's and possibly others' knowledge on a topic. Such projects may result in professional presentations.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SPED 897 Student Teaching****Description:** Laboratory and teaching experience in the area(s) of specialization.**Credit Hours:** 1-9**Min credits per semester:** 1**Max credits per semester:** 9**Max credits per degree:** 15**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**SPED 898 Research Other than Thesis****Crosslisted with:** SPED 498, SLPA 498, SLPA 898**Description:** Individual or group project designed to help students develop understandings, skills, and outlooks that would allow them to conduct original, independent research in the future. Topic of research may be related to the instructors current research projects or area of study or a topic of interest to the student for pilot work; approval of the topic/project is at the discretion of the instructor.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SPED 899 Masters Thesis

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

Description: (course description)

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Grading Option: Pass No-Pass

SPED 901 Meta-Analysis

Prerequisites: Admission to graduate degree program at UNL or permission of instructor

Description: Foundations of meta-analysis. Modern methods for conducting meta-analysis. Examination of moderator analysis and publication bias analysis. Meta-analytic structural equation modeling.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SPED 942 Strategic Interventions for Students with Behavioral Needs

Prerequisites: SPED 824 or admission to a graduate program in Educational Psychology or with 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

Grading Option: Graded

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: Principles and practices for effective partnerships among schools, families, and the community. Cultural reciprocity and family systems theory are emphasized. Spend time with a family with a child with special needs, in order to gain firsthand knowledge of the family experience. Reflect upon these experiences in relationship to readings and discussions.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Prerequisite for: SPED 861

Course and Laboratory Fee: \$10

SPED 990 Special Topics

Crosslisted with: SLPA 990

Prerequisites: Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major.

Description: An in-depth study of professionally-relevant topic(s).

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

SPED 992 Doctoral Seminar

Crosslisted with: SLPA 992

Prerequisites: Admission to a doctoral degree program in Special Education or Speech-Language Pathology

Description: Work with a graduate faculty member on a mutually-agreed upon outcome-based project of shared scholarly interest.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 12

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

SPED 998 Research Other than Thesis

Crosslisted with: SLPA 998

Description: Individual or group project designed to help students develop understandings, skills, and outlooks that would allow them to conduct original, independent research in the future. Topic of research may be related to the instructor's current research projects or area of study or a topic of interest to the student for pilot work; approval of the topic/project is at the discretion of the instructor.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 9

Grading Option: Grade Pass/No Pass Option

SPED 999 Doctoral Dissertation

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

Description: (No description)

Credit Hours: 1-24

Min credits per semester: 1

Max credits per semester: 24

Max credits per degree: 99

Grading Option: Pass No-Pass

Speech-Language Pathology and Audiology (SLPA)

SLPA 805 Systematic Review

Crosslisted with: SPED 805

Prerequisites: Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major

Description: Introduction to research in special education and related paradigms in order to conduct and write a systematic literature review. Includes instruction in conducting database searches and finding relevant literature, methods for evaluating the quality of evidence for effectiveness, developing codebooks and training for reliability, and writing in APA style.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: SLPA 487

SLPA 855 Neural Basis of Reading

Description: This graduate-level course and is designed to address reading development from birth to school-age and the neural basis of reading, as well as developmental dyslexia. Includes in-class discussion and case studies for learning how to evaluate the appropriateness of assessment/treatment plans in evaluating or treating children with reading difficulties, as well as evidence-based practice in reading intervention and learning on how to collect qualitative and quantitative data to monitor progress.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

SLPA 856 Neuroimaging & Language Development

Description: Understanding the characteristics of various types of brain imaging techniques and their applications in the field of communication disorders. Aims to introduce six neuroimaging techniques, including functional Magnetic Resonance Imaging (fMRI), MRI, functional Near-Infrared spectroscopy (fNIRS), Magnetoencephalography (MEG), Electroencephalogram (EEG), and Diffusion-Weighted Imaging (DWI). Hands-on experience with brain imaging data and analyzation through interactive discussion and literature review.

Credit Hours: 2-3

Min credits per semester: 2

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$5**SLPA 862 Cognition and Language in Adults****Prerequisites:** SLPA 453 or equivalent**Description:** Normal and impaired cognition and language in adults. Assessment and evidence-based management. Normal aging, aphasia, TBI, dementia, RHD, and developmental disabilities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**Prerequisite for:** SLPA 897E; SLPA 982; SLPA 988**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**Grading Option:** Grade Pass/No Pass Option**SLPA 862J Severe Disabilities and Autism: Communication Assessment and Intervention****Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**SLPA 864 Language Disorders - ages 5 to 21****Description:** Demonstrate critical thinking and application of knowledge about language disorders, literacy, and curriculum; address disorders and intervention across the age and ability span; integrate all aspects of language disorders including the relationship and interaction of language and literacy, service delivery options (MTSS), responsiveness to intervention (RTI), and the connection among language, literacy and curriculum; introduce functional communication assessment and intervention strategies for developmental language/communication disorders across the age and ability span; develop Interprofessional Practice (IPP) intervention approaches that take into account school, linguistic, and cultural considerations.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Prerequisite for:** SLPA 897G**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**Grading Option:** Graded**SLPA 873 Hearing and Balance II****Crosslisted with:** SLPA 473**Prerequisites:** SLPA 271**Description:** Overview of the principles of audiologic assessment including diagnosing adults with hearing impairments, using physiologic and behavior test procedures. Performance of a basic audiological test batter (including case history, otoscopy, air/bone conduction, pure-tone audiometry, masking, acoustic immittance, and otoacoustic emission). Understand the background theory and interpretations of audiological tests and their implications for dizziness/imbalance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**SLPA 874 Clinical Decision Making I****Description:** Foundations of general service delivery principles for speech-language pathologists including selection of assessment and intervention techniques and instrumentation, data collection and documentation in a variety of settings for all ages and developmental levels. Introduction to basic skills in counseling and behavior management, as applied to the field of speech-language pathology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**Offered:** FALL**Prerequisite for:** SLPA 875**SLPA 875 Clinical Decision Making II****Prerequisites:** SLPA 874 or permission of instructor**Description:** Application and analysis of case studies and clinical experience of service delivery, counseling, assessment/intervention techniques, data collection, documentation and behavior management in the field of speech-language pathology.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option**Offered:** SUMMER**SLPA 877 Sensory Disabilities: Itinerant Teaching Methods****Crosslisted with:** SPED 877**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.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SUMMER**SLPA 884 Deaf or Hard of Hearing: Speech & Language Issues****Crosslisted with:** SPED 884**Prerequisites:** SPED 876 or equivalent. Admission to Graduate Degree or Certificate program in Special Education or by permission of instructor.**Description:** Theories of speech and language development, evaluation, and intervention programming for children who are deaf or hard of hearing.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

SLPA 886 Augmentative and Alternative Communication**Crosslisted with:** SLPA 486**Prerequisites:** Junior status**Description:** Introduction to the augmentative communication options for persons unable to speak or write because of physical, language, or cognitive disability.**Credit Hours:** 2-3**Min credits per semester:** 2**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** SLPA 897E**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**Grading Option:** Grade Pass/No Pass Option**SLPA 890 Special Topics****Prerequisites:** Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major.**Description:** An in-depth study of professionally-relevant topic(s).**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SLPA 894 Independent Study****Crosslisted with:** SLPA 494, SPED 494, SPED 894**Prerequisites:** Prior arrangements with faculty member and permission.**Description:** Individual or group projects that are extensions of course work, such as preparation of teaching materials, review of literature, observation/exploration of practices, design of curricular or clinical tools. Topic, scope and grading parameters are under guidance of a department faculty member, but topic can be student-initiated. These projects are generally relevant to the student's professional practice and advance the student's and possibly others' knowledge on a topic. Such projects may result in professional presentations.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**Course and Laboratory Fee:** \$60**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**Grading Option:** Pass No-Pass**Prerequisite for:** SLPA 897E; SLPA 897G**Course and Laboratory Fee:** \$100**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**Grading Option:** Pass No-Pass

SLPA 897E Advanced Practicum: Externship

Prerequisites: SLPA 486/886, SLPA 862, SLPA 897B, SLPA 966, and SLPA 967

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

Grading Option: Grade Pass/No Pass Option

SLPA 897G Advanced Practicum: Public Schools

Prerequisites: SLPA 864, SLPA 897B, and SLPA 967

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$20

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

Grading Option: Pass No-Pass

SLPA 898 Research Other than Thesis

Crosslisted with: SPED 498, SPED 898, SLPA 498

Description: Individual or group project designed to help students develop understandings, skills, and outlooks that would allow them to conduct original, independent research in the future. Topic of research may be related to the instructors current research projects or area of study or a topic of interest to the student for pilot work; approval of the topic/project is at the discretion of the instructor.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

SLPA 899 Masters Thesis

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

Description: (no course description)

Credit Hours: 1-10

Min credits per semester: 1

Max credits per semester: 10

Max credits per degree: 99

Grading Option: Pass No-Pass

SLPA 901 Auditory Physiology & Assessment

Description: Introductory normal anatomy and pathophysiology of the human adult auditory system and tools for its assessment and treatment. Normal anatomy and physiology contrasted with range of adult pathological conditions. Professional aspects related to adult clinical practice.

Credit Hours: 9

Max credits per semester: 9

Max credits per degree: 9

Grading Option: Graded

Prerequisite for: SLPA 903

SLPA 903 Auditory Perception & Amplification

Prerequisites: SLPA 901

Description: Continuation of normal anatomy and pathophysiology of the human adult auditory system, assessment, and professionalism. Emphasis on auditory perception, adult amplification, and research in audiology topics.

Credit Hours: 9

Max credits per semester: 9

Max credits per degree: 9

Grading Option: Graded

Prerequisite for: SLPA 905

SLPA 905 Intermediate Clinical Techniques

Prerequisites: SLPA 903

Description: Clinical directed experience in foundations of counseling for the adult patient with hearing loss and recognition of culture and diversity. Introductory skills on auditory brainstem response testing, cerumen management, and non-amplification treatment options.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Prerequisite for: SLPA 907

SLPA 907 Pediatrics & Electrophysiology

Prerequisites: SLPA 905

Description: Normal and abnormal anatomy and pathophysiology of the human pediatric auditory system, developmental factors, and tools for pediatric auditory assessment and treatment. Professional aspects related to pediatric clinical practice.

Credit Hours: 8

Max credits per semester: 8

Max credits per degree: 8

Grading Option: Graded

Prerequisite for: SLPA 909

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

Grading Option: Graded

SLPA 909 Implants & Vestibular Assessment**Prerequisites:** SLPA 907**Description:** Introduction to medical audiology including anatomy and pathophysiology of the human vestibular system and tools for its assessment, and theory and practice of cochlear implants across the lifespan. Continuation of professionalism as it relates to the medical otologic patient.**Credit Hours:** 7**Max credits per semester:** 7**Max credits per degree:** 7**Grading Option:** Graded**Prerequisite for:** SLPA 911**SLPA 911 Advanced Clinical Techniques****Prerequisites:** SLPA 909**Description:** Clinical directed experience in specialized topics of audiology including global hearing and public health, educational, and occupational hearing practice.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SUMMER**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**Grading Option:** Graded**Offered:** SPRING**SLPA 913 Advanced Electrophysiology & Amplification****Description:** Advanced concepts in medical and non-medical audiology including amplification, electrophysiological measures, vestibular, and other implantable devices for hearing. Continuation of professionalism as it relates to the complex adult or pediatric patient.**Credit Hours:** 4**Max credits per semester:** 4**Max credits per degree:** 4**Grading Option:** Graded**Prerequisite for:** SLPA 915**SLPA 915 Hearing Conservation & Pharmacology****Prerequisites:** SLPA 913**Description:** Advanced topics in hearing conservation and pharmacology. Conclusion of professionalism in areas of ethics and audiology practice management.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** SLPA 926**SLPA 926 Amplification II****Prerequisites:** SLPA 924**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option

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: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

Prerequisite for: SLPA 897E

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

Grading Option: Graded

Course and Laboratory Fee: \$10

SLPA 967 Motor Aspects of Verbal Communication

Prerequisites: SLPA 453; SLPA 455; or equivalents

Description: Examines speech, voice, resonance, and fluency disorders including acquired and developmental etiologies, symptoms, assessment, and evidence-based clinical management.

Credit Hours: 5

Max credits per semester: 5

Max credits per degree: 5

Grading Option: Graded

Offered: SPRING

Prerequisite for: SLPA 897E; SLPA 897G

SLPA 982 Acquired Brain Injury

Prerequisites: SLPA 453, SLPA 455, and SLPA 862

Description: Focus on cognitive-language, speech, and psychosocial issues related to acquired brain injury, specifically traumatic brain injury and right hemisphere stroke. Assessment, evidence-based treatment, and clinical management as it relates to the scope of practice for speech language pathologists is addressed.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**SLPA 988 Dementia****Prerequisites:** SLPA 862**Description:** Etiology, characteristics, assessment, and intervention pertaining to cognitive and communication disorders associated with various types and stages of dementia.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Graded**SLPA 990 Special Topics****Crosslisted with:** SPED 990**Prerequisites:** Admission to a degree program in Special Education, Speech-Language Pathology or Audiology, Educational Studies or Human Sciences or other relevant major.**Description:** An in-depth study of professionally-relevant topic(s).**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**SLPA 992 Doctoral Seminar****Crosslisted with:** SPED 992**Prerequisites:** Admission to a doctoral degree program in Special Education or Speech-Language Pathology**Description:** Work with a graduate faculty member on a mutually-agreed upon outcome-based project of shared scholarly interest.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**SLPA 998 Research Other than Thesis****Crosslisted with:** SPED 998**Description:** Individual or group project designed to help students develop understandings, skills, and outlooks that would allow them to conduct original, independent research in the future. Topic of research may be related to the instructor's current research projects or area of study or a topic of interest to the student for pilot work; approval of the topic/project is at the discretion of the instructor.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Grade Pass/No Pass Option**SLPA 999 Doctoral Dissertation****Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair**Description:** (no description)**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 816E; 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 875; STAT 876; STAT 886

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: STAT 873; STAT 886

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: AGRO 816E; ASCI 944, STAT 844; STAT 831; STAT 870; STAT 877; STAT 885; STAT 902

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

Offered: FALL/SPR

Prerequisite for: ASCI 944, STAT 844; STAT 822; STAT 831; STAT 870; STAT 874; STAT 875; STAT 878; STAT 902; STAT 973

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

Grading Option: Graded

Prerequisite for: STAT 823; STAT 825; STAT 885; STAT 931

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$10

STAT 831 Spatial Statistics

Prerequisites: STAT 802 and knowledge of matrix algebra or Stat 821

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**STAT 870 Multiple Regression Analysis****Prerequisites:** STAT 801A, STAT 802 or STAT 821 concurrently**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** STAT 874; STAT 878; STAT 902; STAT 974**STAT 871 Generalized, linear, and mixed models****Prerequisites:** STAT 880 or concurrent STAT 883; MATH 314**Notes:** For non-majors only.**Description:** Methods and underlying theory for analyzing data based on generalized, linear, and mixed models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

STAT 873 Applied Multivariate Statistical Analysis**Prerequisites:** STAT 801A or STAT 801B**Notes:** For non-majors only. STAT 870 recommended**Description:** Multivariate techniques used in research. Reduction of dimensionality and multivariate dependencies, principal components, factor analysis, canonical correlation, discriminant analysis, cluster analysis, 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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** STAT 973**STAT 874 Nonparametric Statistics****Prerequisites:** STAT 821 or STAT 870**Description:** Introduction to nonparametric statistics - methodology and supporting theory. Focus of this course is broadly divided into three components: traditional (e.g. distribution-free hypothesis testing), function estimation (e.g. alternatives to parametric linear and nonlinear models) and modern methods that emphasize prediction (e.g., density estimation, robustness, computational methods, reproducing kernel Hilbert space methods).**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**STAT 875 Categorical Data Analysis****Prerequisites:** STAT 801A or STAT 821**Description:** Analysis of contingency tables. Regression models for binary, multi-category, and count responses. Tools for model building. Exact inference methods.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Offered:** SPRING**Prerequisite for:** STAT 902**STAT 878 Time Series Analysis****Prerequisites:** STAT 870 or STAT 821 and either STAT 880 or concurrent STAT 883**Description:** Introduction to models for data observed over time. Both theoretical and practical aspects of time series models will be presented. Main topics include the Box-Jenkins model class, spectral analysis, and GARCH models. Forecasting will be emphasized throughout. The main statistical software package used will be R. Other statistical software packages and programming languages will be introduced as needed.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** CSCE 970; ECON 917; MECH 945; STAT 804; STAT 821; STAT 822; STAT 823; STAT 871; STAT 878; STAT 884; STAT 885; STAT 886**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** ECON 917; STAT 821; STAT 883; STAT 973

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** STAT 822; STAT 823; STAT 878; STAT 885; STAT 886; STAT 931; STAT 950; 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**Grading Option:** Grade Pass/No Pass Option**STAT 885 Introduction to Data Mining and Machine Learning****Prerequisites:** STAT 880 or STAT 883 and STAT 802 or STAT 822**Notes:** Suggested co-requisite STAT 823; Some working knowledge of SQL would be very useful.**Description:** The key topics represent the main areas of data mining and machine learning aimed at achieving predictive accuracy more than physical modeling. These topics are standard classification methods, regularization methods, visualization and geometry of data, leading to kernel methods. Finally, the course introduces trees, neural nets, and model averaging.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**STAT 886 Applied Bayesian Analysis****Prerequisites:** STAT 801A or STAT 801B and either STAT 880 or concurrent STAT 883.**Description:** Bayesian data analysis with emphasis on application and computation using R or similar software. Topics include: probability models, prior distributions, Bayes theorem, single parameter models, posterior predictive distribution, Gibbs sampling, MCMC simulations, regression models, generalized linear models, hierarchical models, model checking and diagnostics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** STAT 986**STAT 889 Statistics Seminar****Prerequisites:** Permission**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**STAT 898 Statistics Report****Prerequisites:** Permission**Description:** A student may take this class and prepare a Statistics report under the supervision of his/her faculty advisor.**Credit Hours:** 0-6**Min credits per semester:****Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**STAT 902 Advanced Experimental Design****Prerequisites:** STAT 821 or STAT 877 or both STAT 802 and STAT 870**Description:** Advanced design concepts, theory and methods used in: construction, analysis and interpretation of incomplete block designs, split-plots, confounded and fractional factorials, screening designs, response surface methods, and other topics.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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. Students will assemble a portfolio of project reports that can be shared with prospective employers.**Credit Hours:** 2**Max credits per semester:** 2**Max credits per degree:** 2**Grading Option:** Grade Pass/No Pass Option

STAT 931 Advanced Spatial and Spatio-temporal Statistics**Prerequisites:** STAT 822 and STAT 883**Notes:** Suggested prerequisite: STAT 831**Description:** This course provides a development of theory and methods for spatial and spatio-temporal statistics. It provides the mathematical foundations and methodological development for topics such as MLE and in-fill asymptotics, non-Gaussian/non-stationary spatial processes, spatio-temporal models, and Bayesian methodology. R will be the main programming language.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**STAT 973 Theory of Multivariate Analysis****Prerequisites:** STAT 873, STAT 882 and STAT 821 or equivalent**Description:** Statistical inference concerning parameters of multivariate normal distributions with applications to multivariate datasets.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** STAT 981; STAT 984; STAT 986**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** STAT 986**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

STAT 986 Theoretical Foundations of Bayesian Analysis**Prerequisites:** STAT 886; and at least one of STAT 980 or STAT 982.**Description:** The foundational ideas and structure of Bayesian theory from its axiomatic and fundamental assumptions, including Savages axioms, complete class theorems, sequential properties, prior selection, model selection, Bayesian nonparametrics, and asymptotics for both the parametric and nonparametric cases.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**STAT 997 Graduate Practicum / Internship****Description:** Participation in the activities of a practicing statistician.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**SCMA 836 Project Management and Implementation****Notes:** Department Supply Chain Management and Analytics not Management**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$40**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**Grading Option:** Graded

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**Grading Option:** Graded**SCMA 847 Information Technologies for Operations and Innovation****Description:** Business leaders must understand how to leverage advanced information technology (IT) for operations and innovation. Learn the foundations of IT, advanced IT trends, and how IT is used to operate, innovate, grow, and transform organizations.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** SCMA 854**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**Grading Option:** Graded**SCMA 853 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**Grading Option:** Graded**SCMA 854 Advanced Analytics and Big Data****Prerequisites:** SCMA 851**Description:** Covers advanced business analytics topics, including data cleansing, classification, clustering, reduction, exploration and visualization. Big data analysis platforms and tools are also covered.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**SCMA 935 Decision Theory****Prerequisites:** Admission to PhD program and permission.**Notes:** This course will take place over an 8-week period.**Description:** Provides an overview of decision theory and decision analysis with a focus on decision-making under uncertainty. Topics covered may include decision theory, which includes a set of mathematical tools for describing and reasoning about decisions, and decision analysis, which involves the application of decision theoretic tools to real world problems. Considers both the mathematical and statistical foundations of decision theory, including Bayesian inference, and the application of these techniques to problems in business.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

SCMA 937 Simulation Modeling and Analysis

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Overview of the uses of simulation and computation for analyzing stochastic models and interpreting real phenomena. Topics covered may include discrete-event simulation, Monte Carlo simulation, generating discrete and continuous random variates, the statistical analysis of simulated data, variance reduction techniques, and simulation optimization. Applications will be drawn from areas such as manufacturing, supply chain management and finance.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 939 Inventory Management and Procurement

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Overview of the research literature in inventory management, including topics such as deterministic and stochastic models for inventory control and multi-echelon inventory theory. Introduce the research literature in the area of procurement, including topics such as supplier management and contract design.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 944 Transportation and Logistics Management

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Provides an overview of the research literature in transportation and logistics modeling, including heuristic and optimization models with both single and multiple objectives, as well as empirical applications. Introduces the research literature in areas such as vehicle routing and location analysis.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 945 Service System Design

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Provides theoretical and methodological background on service system design. Considers the design and delivery of service in industries such as healthcare, banking, retailing, and evolving service sectors, to improve the productivity and quality of the system. Covers different aspects of system design and service delivery, such as technology use and mechanisms to promote individual and organizational learning.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 946 Revenue Management

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Provides an overview of the research literature in demand management and the use of optimization to derive pricing and revenue management decisions in the context of operations management. Topics such as demand and revenue forecasting, customer segmentation, capacity allocation, dynamic pricing, assortment management, discounting, overbooking practices, and auctions that are relevant for industries such as airlines, hotels, restaurants, retailing, online advertising, cloud computing, and ride sharing.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 955 Mathematical Programming for Business

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Provides an overview of mathematical programming theory and techniques, such as linear, integer and nonlinear programming, and will cover both problem formulation and solution approaches. Understanding of formulating and solving large-scale problems in broad application areas of supply chain management and business analytics.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 956 Stochastic Models for Operations and Supply Chain Management

Prerequisites: Admission to PhD program and permission.

Notes: This course will take place over an 8-week period.

Description: Provides the theoretical foundation in stochastic processes necessary to analyze complex systems that exhibit random behavior over time, which regularly arise in operations and supply chain management. Introduces the basic concepts of stochastic processes, describe the types of stochastic processes most commonly used in the study of operations and supply chain management, discuss how to identify the appropriate type of process to model a given system, and demonstrate the methods used to model and analyze stochastic systems.

Credit Hours: 1-3

Min credits per semester: 1

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

SCMA 994 Topics in SCMA

Prerequisites: Admission to PhD program and permission.

Notes: This course will meet for 1 hour per week over a 16-week period.

Description: Exposure to the variety of methods used and topics studied in operations management, supply chain management and analytics, with a focus on state-of-the art research. Exposure to on-going research through methods such as attendance and participation in departmental and college seminars, and meetings with visiting speakers and scholars.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 12

Grading Option: Pass No-Pass

SCMA 996 Directed Reading or Research**Prerequisites:** Admission to PhD program and permission.**Description:** Individual research or reading on a selected problem in operations management, supply chain management, or analytics.**Credit Hours:** 1-3**Min credits per semester:** 1**Max credits per semester:** 3**Max credits per degree:** 24**Grading Option:** Pass No-Pass**SCMA 999 Doctoral Dissertation****Prerequisites:** Admission to PhD program and permission.**Description:** Research credits required for a doctoral dissertation for completion of degree.**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 55**Grading Option:** Pass No-Pass

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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** TEAC 888**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** TEAC 888**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$15

TEAC 807A Equitable Practices in Mathematics Education: Identity, Access, & Equity in Mathematics Education

Description: Analysis of the application of equitable practices to improve the teaching and learning of mathematics. The course focuses on how social, historical, and institutional contexts affect mathematics teaching and learning and specifically on issues of identity, access, and equity in mathematics education from theoretical and practical perspectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

TEAC 807B Equitable Practices in Mathematics Education: Teaching Mathematics for Social Justice

Description: Analysis of the application of equitable practices to improve the teaching and learning of mathematics. Specifically, the course focuses on the theoretical and practical implications for teaching mathematics for social justice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

TEAC 807C Equitable Practices in Mathematics Education: Mathematics Classroom Discourse

Description: Analysis of the application of equitable practices to improve the teaching and learning of mathematics. Specifically, the course focuses on the roles and contexts of mathematics classroom discourse and the practical implications for supporting productive, powerful, and purposeful discourse as an equity practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

TEAC 808 Improvement of Instruction in School Mathematics

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: 12

Grading Option: Grade Pass/No Pass Option

Prerequisite for: TEAC 907

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 808E Improvement of Instruction in School Mathematics Secondary: 7-12

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: 12

Grading Option: Grade Pass/No Pass Option

TEAC 808G Improvement of Instruction in School Mathematics: Manipulatives in Mathematics Education

Description: Techniques, plans, and procedures for improving instruction in mathematics. Analysis of current instructional and supervisory practices. Evaluation of research and instructional materials. This course is devoted to the role of manipulative materials (both concrete and virtual) in promoting mathematics learning. A philosophy of using manipulatives is developed and integrated with a range of experiences proven effective in helping students learn mathematics. The topics and materials will range from primary to middle grades to secondary mathematics.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**TEAC 813T ICMEE Expansion: Teacher-Learner Inquiry****Prerequisites:** Permission**Notes:** Only completers of ICMEE eWorkshops will be eligible to take this course.**Description:** Builds on linguistically responsive pedagogical skills developed in an ICMEE eWorkshop. Specific attention will be paid to the articulations of connections among teaching practice, global contexts, and local communities, with the objective of improving teaching and learning for multilingual K-12 learners.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**TEAC 815E Emerging Bilingualism****Description:** The foundation, theory, and practice of teaching dual language learners.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Practicum**TEAC 816A Literacy Methods for the Primary Student: K to 3rd****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:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 816B Social Studies and Science Methods for the Primary Student: K to 3rd****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:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 816D Unified Primary Schooling: Methods and Teaching K-3****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 836G Professional Development: Mathematics Education Leadership**

Description: Equip professionals to understand and develop as leaders of mathematics education P-20 settings. Issues include reviewing, analyzing, discussing, and applying research from diverse perspectives in education, reflecting on one's own teaching, furthering professional goals of actively leading colleagues in their schools, districts, and professional organizations, and developing a mathematics teacher leader identity.

Credit Hours: 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

TEAC 838 Linguistics in Language and Learning Contexts**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 840M Language and Power****Notes:** This course counts towards the Graduate Certificate in Social Justice and Diversity Education**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** TEAC 924**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 846G Introduction to Curriculum Studies: Mathematics Curriculum Analysis & Design

Description: Historical development and philosophy of school curricula. Review of research on schooling, curriculum trends, and school organizational structures. Specifically, the course focuses on the analysis and design of PK-16 mathematics curriculum materials from theoretical and practical perspectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 848G Introduction to Curriculum Studies: Mathematics Curriculum Analysis & Design

Description: Historical development and philosophy of school curricula. Review of research on schooling, curriculum trends, and school organizational structures. Specifically, the course focuses on the analysis and design of PK-16 mathematics curriculum materials from theoretical and practical perspectives.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

TEAC 849A Classroom Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

TEAC 849B Large-scale Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

TEAC 849E Leadership in Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

TEAC 849G Studies in Assessment and Leadership for Learning: Assessment in Mathematics Education

Description: Preparation for assessing K-12 learners and leading K-12 Teacher Learning Communities. Specifically, the course focuses on examining mathematics classroom assessment practices and policies. Emphasis will be placed on understanding assessment from both a theoretical and practical perspective and implications for planning and enacting mathematics instruction.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

TEAC 849J Leading Classroom Assessment

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15

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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Other**TEAC 854 Multiethnic Literature for Children & Adolescents****Crosslisted with:** TEAC 454**Description:** Engage with literature written for children and adolescent audiences that examines cultural and ethnic portrayals of texts and illustrations. Study a variety of genres set in various global locations as well as works focusing on the lives of minority and marginalized groups in the United States. Critically examine and explore past and current literary representations of race, ethnicity, gender, and culture as reflected by people, places, and customs in connection to one's own perceptions and how such views develop. Inquiry and critical analysis serve as the foundation for exploration and understanding of issues presented in this course.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** SUMMER**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 858 School Technology Leadership

Notes: Taught with existing staff.

Description: Explores and applies key educational leadership principles in technology use. Focuses on developing shared vision, planning and access, integration of technology into instruction, assessment and evaluation, support and professional development, community relationships, and ethical and legal issues.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

TEAC 862 Seminar in Democratic Education

Description: Introduction to the field of democratic education; explores the relationship between democracy and schooling; examines purposes of schools, ideology and curriculum, the relationship between social class and citizen-production in schooling, as well as the role of discussion, deliberation, and trust in democratic schooling.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

TEAC 864 The Nature of Science in Science Teaching**Prerequisites:** Graduate standing**Description:** Study of the nature of science (NOS) as a human endeavor, its basis in uncertainty, the power and limits of scientific theories, the development and replacement of theories over time, and design of science activities/lessons/units that illustrate these principles**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 880M Teaching with Technology: Learning Analytics, Assessment, and Evaluation****Crosslisted with:** TEAC 480M**Notes:** Due to the rapidly changing nature of learning analytics this course may be repeated.**Description:** Survey and analysis of the application of technology-supported learning analytics, assessment, and evaluation to improve teaching and learning. Research and related literature on learning, teaching and curriculum, and the critical application of technology and the development of technology's role in supporting teaching and learning strategies.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**Offered:** SUMMER**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$15

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 890 Workshop Seminar**Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**TEAC 891 Special Topics in Human Sciences****Crosslisted with:** HUMS 891, NUTR 891, SLPA 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Pass No-Pass

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

TEAC 895 Independent Study

Credit Hours: 1-6

Min credits per semester: 1

Max credits per semester: 6

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Pass No-Pass**Prerequisite for:** TEAC 803; TEAC 803B**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass**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**Grading Option:** Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

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

Grading Option: Pass No-Pass

Course and Laboratory Fee: \$25

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 908J Critical Conversations in U.S. Teacher Preparation Policy and Practice: Teacher Education To What E****Description:** Explore teacher education in the United States through examining media artifacts, analyzing select books and readings, and engaging in activities and discussion. Study key issues in teacher education, the current context for teacher education in the U.S., the historical development of teacher education, agendas for reform, alternative pathways to teaching, and external and internal critiques of university-based teacher education. Engage in ongoing discussion to determine the quality of teacher education programs and develop policies at the state and national level to support high quality teacher preparation.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 922A Teaching for Intercultural Communicative Competence in the Spanish Language Classroom****Crosslisted with:** SPAN 922A**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching culture and intercultural communicative competence in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

TEAC 922B The Interpretive Mode: Reading and Listening in the Spanish Language Classroom**Crosslisted with:** SPAN 922B**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching reading, listening and viewing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922C The Interpretive Mode: Reading and Listening in the German Language Classroom****Crosslisted with:** GERM 922C**Prerequisites:** Substantial content knowledge in German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching reading, listening and viewing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922D The Interpretive Mode: Reading and Listening in the Chinese Language Classroom****Crosslisted with:** CHIN 922D**Prerequisites:** Substantial content knowledge in Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of strategies for teaching reading, listening and viewing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922E Teaching for Intercultural Communicative Competence in the German Language Classroom****Crosslisted with:** GERM 922E**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching culture and intercultural communicative competence in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922F Interpersonal and Presentational Writing in the Spanish Language Classroom****Crosslisted with:** SPAN 922F**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching writing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922G Interpersonal and Presentational Writing in the German Language Classroom****Crosslisted with:** GERM 922G**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching writing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922H Interpersonal and Presentational Writing in the Chinese Language Classroom****Crosslisted with:** CHIN 922H**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of strategies for teaching writing in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

TEAC 922K Interpersonal and Presentational Speaking in the Spanish Language Classroom**Crosslisted with:** SPAN 922K**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of strategies for teaching both interpersonal and presentational speaking with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922L Interpersonal and Presentational Speaking in the German Language Classroom****Crosslisted with:** GERM 922L**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of strategies for teaching both interpersonal and presentational speaking with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922M Interpersonal and Presentational Speaking in the Chinese Language Classroom****Crosslisted with:** CHIN 922M**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of strategies for teaching both interpersonal and presentational speaking with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**TEAC 922N Teaching for Intercultural Communicative Competence in the Chinese Language Classroom****Crosslisted with:** CHIN 922N**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of strategies for teaching culture and intercultural communicative competence in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922O Assessment in the Spanish Language Classroom****Crosslisted with:** SPAN 922O**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores the fundamental concepts and principles of assessment in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922P Assessment in the German Language Classroom****Crosslisted with:** GERM 922P**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores the fundamental concepts and principles of assessment in the language classroom with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922Q Assessment in the Chinese Language Classroom****Crosslisted with:** CHIN 922Q**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 922S Planning in the Spanish Language Classroom****Crosslisted with:** SPAN 922S**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of instructional planning strategies for the purposes of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

TEAC 922T Planning in the German Language Classroom**Crosslisted with:** GERM 922T**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of instructional planning strategies for the purposes of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922U Planning in the Chinese Language Classroom****Crosslisted with:** CHIN 922U**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of instructional planning strategies for the purposes of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 922W Technology-Enhanced Spanish Language Instruction****Crosslisted with:** SPAN 922W**Prerequisites:** Substantial content knowledge of Spanish (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Spanish language teaching and learning. This online course explores a variety of technology tools for foreign language with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922X Technology-Enhanced German Language Instruction****Crosslisted with:** GERM 922X**Prerequisites:** Substantial content knowledge of German (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of German language teaching and learning. This online course explores a variety of technology tools for foreign language with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**TEAC 922Y Technology-Enhanced Chinese Language Instruction****Crosslisted with:** CHIN 922Y**Prerequisites:** Substantial content knowledge of Chinese (e.g., employment as a language educator, degree in the language, university language faculty and/or graduate student, etc.).**Description:** Critical review and evaluation of current literature, research and theory in the area of Chinese language teaching and learning. This online course explores a variety of technology tools for foreign language with the purpose of improving language teaching and student achievement.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 935 Seminar in Qualitative Research****Crosslisted with:** EDPS 935**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 949B Critical, Anti-colonial, & Decolonizing Theories in Education

Description: Explore relevant principles, problems, and practices related to a variety of critical and race-based epistemologies. Analyze key tensions in US-based approaches to educational theory and curriculum inquiry and then study, discuss, reflect, and apply race-based and anti-/de-colonial approaches to educational theory and curriculum inquiry emergent in the US and beyond. Engage in critical reflection on the implications of such approaches for their work as educators, mentors, and researchers. Progress toward confronting the tensions surrounding racial socialization in students' own lives as citizens, educators, and researchers; participate in structured writing and reflection to identify the ways these levels of engagement can be developed through newfound understandings of how knowledge systems have historically been shaped by colonizing ideologies. Equip students to commit to informed action steps in schools and communities that bring about sustained efforts toward equity for all learners.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TEAC 989 Psychology of Reading and Writing**Crosslisted with:** EDPS 989**Notes:** 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TEAC 993 Workshop Seminar****Credit Hours:** 1-12**Min credits per semester:** 1**Max credits per semester:** 12**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Textiles, Merchandising and Fashion Design (TMFD)

TMFD 803 Apparel Design by Draping

Crosslisted with: TMFD 403

Prerequisites: TMFD 212 & TMFD 216 for TMFD 403 ONLY

Description: Creative experience in designing apparel through the use of draping techniques.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Prerequisite for: TMFD 471, TMFD 871; TMFD 823

Course and Laboratory Fee: \$25

Experiential Learning: Other

TMFD 805 Advanced Textiles

Crosslisted with: TMFD 405

Prerequisites: Prerequisite for TMFD 405 ONLY: TMFD 206; CHEM 105A and 105L or CHEM 109A and 109L or CHEM 113A and 113L.

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

Grading Option: Grade Pass/No Pass Option

TMFD 806 Textile Testing and Evaluation

Crosslisted with: TMFD 406

Prerequisites: TMFD 206 required for TMFD 406 only

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

Grading Option: Grade Pass/No Pass Option

Experiential Learning: Other

TMFD 807 History of Dress

Crosslisted with: TMFD 407

Prerequisites: Junior standing, AHIS 101 or 102 or 3 hrs HIST 130 or 131 for TMFD 407 ONLY

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: TMFD 876, ANTH 883

Experiential Learning: Other

TMFD 808 Textiles, Technology and Culture

Crosslisted with: TMFD 408

Prerequisites: TMFD 408: Junior standing, TMFD 206, AHIS 101 or 102 or 3 hrs HIST 130 or 131. Undergraduate Only.

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: TMFD 876, ANTH 883

Experiential Learning: Other

TMFD 809 Museums: Theory and Practice

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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Course and Laboratory Fee: \$30

TMFD 810 Body, Dress and Identity

Crosslisted with: TMFD 410, WMNS 410A, WMNS 810A

Prerequisites: TMFD 410 ONLY: Junior or Senior standing; 3hrs 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Prerequisite for: TMFD 910

Experiential Learning: Other

TMFD 811 Textiles, Fashion, and Design Problems**Prerequisites:** 12 hrs TMFD courses 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**Grading Option:** Grade Pass/No Pass Option**TMFD 811A Textiles, Fashion, and Design Problems: Textiles****Prerequisites:** 12 hrs TMFD courses and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**TMFD 811B Textiles, Fashion, and Design Problems: Fashion****Prerequisites:** 12 hrs TMFD courses and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**TMFD 811D Textiles, Fashion, and Design Problems: Design****Prerequisites:** 12 hrs TMFD courses and permission**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 12**Grading Option:** Grade Pass/No Pass Option**TMFD 812 Product Development IV: Trend Analysis & Product Conceptualization****Crosslisted with:** TMFD 412**Prerequisites:** SR Standing; For Merch and Textile and Apparel Design option: TMFD312, MRKT300 & 6 hrs from following: ACCT200, ECON200, BLAW300, FINA300, MNGT300. For Textile Sci & Textile, Merch & Fashion Design Comm option: TMFD312 & ECON200. for TMFD412 undrgrd only**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**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**Experiential Learning:** Other**TMFD 813 Merchandising III: Textiles & Apparel Merchandise Development & Retail Strategies****Crosslisted with:** TMFD 413**Prerequisites:** ACCT 201 or ACCT 201H; MRKT 341 or 341H; TMFD 313 and 314; for Undergraduate ONLY**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** TMFD 907; TMFD 913**Experiential Learning:** Other**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** TMFD 823**Course and Laboratory Fee:** \$20**Experiential Learning:** Other**TMFD 817 Textiles and Dress: A Cultural Perspective****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**Grading Option:** Grade Pass/No Pass Option**TMFD 818 Quilts, History, Culture****Prerequisites:** Permission.**Description:** Influence of social, political, artistic and technological developments on quilting traditions.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option

TMFD 820 Launch a Product in a Semester**Crosslisted with:** TMFD 420**Prerequisites:** Undergraduate only TMFD 212; Jr. standing or above**Description:** Small business start-up, launching products within organizations or setting new growth strategies in a short period of time. Emphasis on knowledge of entrepreneurial management and development strategies and growth in team-work settings.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Experiential Learning:** Other**TMFD 822 International Textile and Apparel Sourcing****Crosslisted with:** TMFD 422**Prerequisites:** Senior Standing and TMFD 313 for TMFD 422 ONLY**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**Grading Option:** Grade Pass/No Pass Option**Experiential Learning:** Other**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$30**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**TMFD 825 Advanced Design for Printed Textiles****Crosslisted with:** TMFD 425**Prerequisites:** TMFD 145 & TMFD 146 for Undergraduate Only;**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**Experiential Learning:** Other**TMFD 828 Coloration****Crosslisted with:** TMFD 428**Prerequisites:** 4 hrs CHEM and TMFD 206, for TMFD 428 (undergraduate) ONLY**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**Experiential Learning:** Other**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**TMFD 854 Promotional Strategies in Merchandising****Prerequisites:** Admission to the Merchandising Specialization Masters Degree program or permission**Description:** Examination of intergrated marketing communications (i.e., promotional strategies and techniques) while fostering cultural and global awareness, social responsibility and ethical descitions-making in the field of promotion.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Offered: FALL

TMFD 863 Merchandising 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

Grading Option: Graded

Offered: FALL/SPR

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

TMFD 871 Experimental Apparel Design

Crosslisted with: TMFD 471

Prerequisites: TMFD 803 for Graduate Level Course Only.

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: 6

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$35

Experiential Learning: Other

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$25

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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$25

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

Grading Option: Grade Pass/No Pass Option

TMFD 876 Material Culture Research Methods

Crosslisted with: ANTH 883

Prerequisites: TMFD 807 or TMFD 808

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

Grading Option: Grade Pass/No Pass Option

Offered: FALL

Course and Laboratory Fee: \$10

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

Grading Option: Grade Pass/No Pass Option

TMFD 879 Foundations of Sustainability in Apparel and Textiles

Prerequisites: Graduate-level GPIEDA students only

Notes: Distance education course delivered by Kansas State University. Graduate-level GPIEDA students only

Description: Introduction to the theory, principles, and practices of sustainability. Examination of environmental, social, and economic sustainability at both the global and apparel and textile industry levels. Exploration of innovative practices and social change strategies for the furtherance of sustainability.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TMFD 892 Professional Study Tour-International or Domestic****Crosslisted with:** TMFD 492**Prerequisites:** 12 hrs TMFD courses and permission for TMFD 892 only.**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**Grading Option:** Grade Pass/No Pass Option**TMFD 893 Domestic Study Tour****Crosslisted with:** TMFD 493**Prerequisites:** 12 hrs. TMFD courses.**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**Grading Option:** Graded**TMFD 896 Independent Study****Crosslisted with:** TMFD 496**Prerequisites:** 12 hrs TMFD courses and permission for TMFD 896 only.**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**Grading Option:** Grade Pass/No Pass Option**TMFD 896A Independent Study - Textiles****Crosslisted with:** TMFD 496A**Prerequisites:** 12 hrs TMFD courses and permission for TMFD 896 only.**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**Grading Option:** Grade Pass/No Pass Option**TMFD 896B Independent Study - Fashion****Crosslisted with:** TMFD 496B**Prerequisites:** 12 hrs TMFD courses and permission for TMFD 896 only.**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**Grading Option:** Grade Pass/No Pass Option**TMFD 896D Independent Study - Design****Crosslisted with:** TMFD 496D**Prerequisites:** 12 hrs TMFD courses and permission for TMFD 896 only.**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**Grading Option:** Grade Pass/No Pass Option**TMFD 899 Masters Thesis****Prerequisites:** Admission to a Master's degree program.**Notes:** Permission Required**Description:** Individualized per Masters Thesis**Credit Hours:** 1-10**Min credits per semester:** 1**Max credits per semester:** 10**Max credits per degree:** 99**Grading Option:** Grade Pass/No Pass Option**TMFD 905 Advanced Problems****Prerequisites:** Permission of Department 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**Grading Option:** Grade Pass/No Pass Option**TMFD 905A Advanced Problems: Textiles****Prerequisites:** Permission of department chair.**Description:** Advanced Problems: Textiles**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option

TMFD 905B Advanced Problems: Fashion**Prerequisites:** Permission of department chair.**Description:** Advanced Problems: Fashion**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**TMFD 905D Advanced Problems: Design****Prerequisites:** Permission of department chair.**Description:** Advanced Problems: Design**Credit Hours:** 1-6**Min credits per semester:** 1**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Grade Pass/No Pass Option**TMFD 907 Textiles and Apparel Economics****Prerequisites:** TMFD 813; 9 hrs of TMFD courses.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TMFD 920 Teaching Seminar and Practicum****Crosslisted with:** CYAF 920, NUTR 920**Description:** Supervised classroom experiences designed to develop competencies in teaching at the college level.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TMFD 986 Seminar in Textiles, Clothing, and Design****Prerequisites:** Permission**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TMFD 997 Internship****Prerequisites:** 9 hrs TMFD courses and permission.**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**TMFD 999 Doctoral Dissertation****Prerequisites:** Admission to PhD degree program and permission.**Description:** Individualized per Doctoral Dissertation.**Credit Hours:** 1-24**Min credits per semester:** 1**Max credits per semester:** 24**Max credits per degree:** 99**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Graded

Course and Laboratory Fee: \$60

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: THEA 408; THEA 409, THEA 809; THEA 411, THEA 811; THEA 420, THEA 820

Course and Laboratory Fee: \$50

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

Grading Option: Graded

Prerequisite for: THEA 414, THEA 814

Course and Laboratory Fee: \$75

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

Grading Option: Graded

Prerequisite for: THEA 408; THEA 409, THEA 809; THEA 420, THEA 820

Course and Laboratory Fee: \$175

THEA 812A Masters Scenic Design Studio

Notes: Graduate Scenic Design students will be expected to take this course each fall semester.

Description: Theory and practice of scene design for professional development. Focusing on the conceptual process through ideation and revision.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 9

Grading Option: Graded

Offered: FALL

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

Grading Option: Graded

Prerequisite for: THEA 415, THEA 815

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**Grading Option:** Graded**Course and Laboratory Fee:** \$75**THEA 815 Production Design for Film and Television****Crosslisted with:** THEA 415**Prerequisites:** THEA 413/813 or EMAR 252**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**Grading Option:** Graded**Course and Laboratory Fee:** \$50**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**Grading Option:** Graded**Course and Laboratory Fee:** Total Seats Needed: 150**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** THEA 408; THEA 409, THEA 809; THEA 419, THEA 819**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$20**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**Grading Option:** Graded**Course and Laboratory Fee:** \$60**THEA 823 Rendering for the Theatre****Crosslisted with:** THEA 423**Prerequisites:** THEA 120**Description:** Principles and techniques of hand rendering for the entertainment arts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Graded**Offered:** FALL/SPR**Course and Laboratory Fee:** \$50**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**Grading Option:** Graded**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**Grading Option:** Graded

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**Grading Option:** Graded**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**Grading Option:** Graded**Offered:** FALL/SPR**Groups:** Introductory**Course and Laboratory Fee:** \$75**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**Grading Option:** Graded**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**Grading Option:** Graded**Course and Laboratory Fee:** \$100**THEA 833 Advanced Costume Construction****Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**THEA 834 Business of Design****Crosslisted with:** THEA 434**Description:** Freelance-based career preparations and business skill development for the entertainment artist. Topics include, but are not limited to: contracts, taxes, record keeping, budgets, resumes, portfolios, job hunting, legal considerations, and personal branding.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Course and Laboratory Fee:** \$20**THEA 835 Period Patterning****Credit Hours:** 3-6**Min credits per semester:** 3**Max credits per semester:** 6**Max credits per degree:** 6**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$120**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**Grading Option:** Graded

THEA 841 Period Styles for Entertainment Designers**Crosslisted with:** THEA 441**Prerequisites:** THEA 112G, THEA 120, and THEA 201**Description:** Survey of major trends and movements in art, architecture, and fashion as they apply to entertainment design.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**THEA 842 History of Theatre Design and Technology****Crosslisted with:** THEA 442**Prerequisites:** THEA 112G, THEA 120 and THEA 201**Description:** A survey of major technological advancements and how they influenced the storytelling practices of live performance.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**THEA 843 Master Scenic Design Studio****Crosslisted with:** THEA 443**Prerequisites:** THEA 413**Description:** Professional level preparation for Environmental Designers in the Entertainment Arts.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 9**Grading Option:** Graded**Offered:** FALL**THEA 844 Scale Model Making****Crosslisted with:** THEA 444**Prerequisites:** THEA 120**Description:** Exploring the skills and techniques used in creating detailed scale models for the pre-visualization or miniature work in theater and film.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Course and Laboratory Fee:** \$200**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**Grading Option:** Graded**THEA 846 Digital Studio for Designers****Crosslisted with:** THEA 446**Prerequisites:** THEA 120 or EMAR 140**Description:** Focus on higher level skills development for advanced 3D rendering, photo manipulation, 3D printing, and design process.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Course and Laboratory Fee:** \$175**THEA 847 Sandbox Mode: Concept Art for Media Genres****Crosslisted with:** THEA 447**Prerequisites:** THEA 120 and THEA 423**Description:** Exploration of conceptual and visual ideas for various media, using a common source material to create a world before developing the story.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**Course and Laboratory Fee:** \$75**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**Grading Option:** Graded**Prerequisite for:** THEA 451, THEA 851**Course and Laboratory Fee:** \$50**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**Grading Option:** Graded**Course and Laboratory Fee:** \$50**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**Grading Option:** Graded**Groups:** Opera/Music Theatre Performanc**Course and Laboratory Fee:** \$50

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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**THEA 884 Advanced Projects in Film Production and/or New Media****Crosslisted with:** THEA 484**Prerequisites:** EMAR 252**Description:** Projects in screenwriting, film production, digital animation, and new media.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**THEA 886 Film: Producing****Crosslisted with:** THEA 486**Prerequisites:** EMAR 252 and EMAR 311**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**Grading Option:** Graded**Course and Laboratory Fee:** \$175**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**Grading Option:** Graded**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$50**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

TLMT 814 Turfgrass Disease Management

Crosslisted with: AGRO 814, HORT 814, PLPT 414, PLPT 814, PLAS 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

Grading Option: Grade Pass/No Pass Option

TLMT 827 Turfgrass Systems Management

Crosslisted with: PLAS 427, AGRO 827, HORT 827

Prerequisites: PLAS 227 and PLAS 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

Grading Option: Grade Pass/No Pass Option

Course and Laboratory Fee: \$50

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

Grading Option: Grade Pass/No Pass Option

TLMT 880 Modified Root Zones

Crosslisted with: PLAS 480, AGRO 880, HORT 880

Prerequisites: PLAS 153/SOIL 153

Notes: Recommend CHEM 105A/CHEM 105L or CHEM 109A/CHEM 109L, PLAS 131, PLAS 227, and PLAS 453 or PLAS 472

Description: Modified root zones 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: VBMS 975

VBMS 806 Introduction to the Principles of Biosecurity and Disease Transmission

Crosslisted with: VMED 506, VBMS 406

Prerequisites: VBMS 406: Open to juniors or seniors who have completed LIFE 120 & LIFE 121. VBMS 806: Open to graduate students enrolled in the UNL Graduate College. VMED 506: Open to veterinary professional students.

Description: An introduction into biosecurity and the principles of disease transmission. Covering the concepts of infectious disease transmission with practical applications for control and prevention.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

VBMS 808 Functional Histology**Crosslisted with:** BIOS 408, BIOS 808, VBMS 408**Prerequisites:** BIOS 101 and 101L or LIFE 120 and 120L; 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$15**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** AGRO 963, HORT 963, PLPT 963; 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Graded**VBMS 840 Microbial Physiology****Crosslisted with:** BIOS 440, BIOS 840, MBIO 440, VBMS 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**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$20**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** VBMS 805; VBMS 949**Course and Laboratory Fee:** \$25**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**Grading Option:** Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

VBMS 843 Immunology

Crosslisted with: BIOS 443, BIOS 843, MBIO 443, VBMS 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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Prerequisite for: 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

VBMS 909 Seminar

Credit Hours: 1-4

Min credits per semester: 1

Max credits per semester: 4

Max credits per degree: 4

Grading Option: Pass No-Pass

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

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**Grading Option:** Graded

VMED 505 Principles in Population Medicine

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program.

Notes: Students may be required to complete an off campus observation outside of regularly scheduled class times.

Description: Prevention and control of disease in animal populations is a vital function of veterinary medicine. Familiar with population medicine concepts using a practical approach. While the primary focus is on population medicine as it applies to companion animal sheltering, the principles presented have broad application across several fields of practice including but not limited to large animal, zoo, wildlife, and research.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

VMED 506 Introduction to the Principles of Biosecurity and Disease Transmission

Crosslisted with: VBMS 406, VBMS 806

Prerequisites: VBMS 406: Open to juniors or seniors who have completed LIFE 120 & LIFE 121. VBMS 806: Open to graduate students enrolled in the UNL Graduate College. VMED 506: Open to veterinary professional students.

Description: An introduction into biosecurity and the principles of disease transmission. Covering the concepts of infectious disease transmission with practical applications for control and prevention.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

VMED 508 Spanish for Veterinarians

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program.

Notes: At least two years of high school Spanish or equivalent coursework highly recommended.

Description: Achieve a working vocabulary of technical and clinical veterinary terms that will enable professional communication with Spanish-speaking clients, farm managers, or other animal care givers.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Offered: SPRING

VMED 511 Foundations of Veterinary Medicine

Prerequisites: Must be admitted to the UNL-ISU Veterinary Medicine Program.

Description: Basic behavior, handling, restraint, and physical examination of cats and dogs. Basic clinical skills and an introduction to clinical cases. Medical record keeping and interpersonal communication in veterinary practice. Acquisition and use of clinical scientific information. Diversity and inclusion in veterinary medicine.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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: Basic behavior, handling, restraint, and physical examination of ruminants, horses, lab animals, and exotic animals. Specific canine clinical examination techniques. Basic clinical skills and an introduction to production animal medicine. Interpersonal communication in veterinary practice. Diversity and inclusion in veterinary medicine.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Offered: SPRING

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: Preventive care principles and applications. Discussion of clinical cases. Acquisition and use of clinical scientific information. Interpersonal communication in veterinary practice. Applied clinical skills practice.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

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 practice. Regulatory veterinary medicine. Discussion of clinical cases. Applied clinical skills practice.

Credit Hours: 2

Max credits per semester: 2

Max credits per degree: 2

Grading Option: Graded

Offered: SPRING

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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: 0-3

Min credits per semester:

Max credits per semester: 3

Max credits per degree: 6

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

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

Grading Option: Graded

Course and Laboratory Fee: \$20

WATS 884 Water Resources Seminar

Crosslisted with: PLAS 484, GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, AGRO 884, GEOG 884, GEOL 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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

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

Grading Option: Grade Pass/No Pass Option

Groups: CAS Diversity in the US

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

Grading Option: Grade Pass/No Pass Option

WMNS 810A Body, Dress and Identity

Crosslisted with: TMFD 410, TMFD 810, WMNS 410A

Prerequisites: TMFD 410 ONLY: Junior or Senior standing; 3hrs 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

Grading Option: Grade Pass/No Pass Option

Offered: SPRING

Prerequisite for: TMFD 910

Experiential Learning: Other

WMNS 812 Religion, Gender, and Sexuality

Crosslisted with: SOCI 412, SOCI 812, WMNS 412

Prerequisites: Junior or Senior standing

Description: Examination of how religion is used to shape, maintain, and transform gender and sexuality in the U.S. and beyond. Focus on the intersection of religion, gender, and sexuality from a feminist/queer theoretical perspective.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Grade Pass/No Pass Option

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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Groups:** CAS Diversity in the US**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Groups:** General Economics and Theory**Experiential Learning:** Research**WMNS 854 Gender and Sexuality in Spain****Crosslisted with:** SPAN 454, SPAN 854, WMNS 454**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Analysis of gender and sexuality in the culture and literature of Spain, covering topics related to women's studies, masculinities and LGBTQ+ issues.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL**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**Grading Option:** Grade Pass/No Pass Option**WMNS 870 Feminisms in Latin America****Crosslisted with:** LAMS 470, SPAN 470, SPAN 870, WMNS 470**Prerequisites:** SPAN 321 or SPAN 331; and one of SPAN 311, SPAN 312, SPAN 314, or SPAN 315**Description:** Examination of a variety of feminist Latin American texts including poetry, fiction, history, philosophy and political manifestos from a cultural and literary studies perspective. Consideration of pop culture and visual artists.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option

WMNS 877 Gender and Material Culture**Crosslisted with:** TMFD 477, TMFD 877, WMNS 477, 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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**Prerequisite for:** WMNS 489**WMNS 886 Sociology of Gender****Crosslisted with:** SOCI 486, SOCI 886, WMNS 486**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Grade Pass/No Pass Option**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**Grading Option:** Pass No-Pass**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**Grading Option:** Grade Pass/No Pass Option

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. 6) 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. 507)
 - Teacher Certification (p. 521)

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 Floriculture and Nursery Production Management:

1. Learn More. (<https://www.unl.edu/gradstudies/academics/programs/AHRT-GCER/>)
2. Apply for admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as outlined here, with grades of B or higher in all classes.

| Required Courses (choose 12 credits from the following) | | 12 |
|--|---|-----------|
| 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 | Entrepreneurship and Enterprise Development | 3 |
| HORT 842B | Plant Physiology | 3 |
| HORT 843A | Greenhouse Crop Production | 4 |

Floriculture and Nursery Production Management

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

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FNPM-GCER/>).
2. Apply for admission. (<https://www.unl.edu/gradstudies/admissions/steps/>)
3. Consult an advisor to develop a plan of study.
4. 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.

| Required Courses (6-7 credits) | | 6-7 |
|---|---|------------|
| HORT 824 | Plant Nutrition and Nutrient Management | 3 |
| or HORT 842B Plant Physiology | | |
| HORT 843A | Greenhouse Crop Production | 3-4 |
| or HORT 844A Environmental Nursery Production Practices | | |
| Electives (5-6 credits) | | 5-6 |
| HORT 843E | Advanced Interiorscaping | 3 |
| HORT 844B | Environmental Stress Physiology | 1 |
| HORT 888 | Entrepreneurship and Enterprise Development | 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FDSD-GCER/>).

2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours, with 9 credit hours in core courses and 3 elective credit hours.

| Required Courses (9 credits) | | 9 |
|-------------------------------------|--|----------|
| 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 (3 credits) | | 3 |
| 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/GRSM-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as planned. Up to half of the required coursework may be transferred on a case-by-case basis with the approval of the student's advisor.

| Required Courses (12-13 credits) | | 12-13 |
|---|-------------------------------------|--------------|
| 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/ORLT-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here, with grades of B or higher in all classes.

| Required Courses (6 credits) | | 6 |
|-------------------------------------|---|----------|
| HORT 824 | Plant Nutrition and Nutrient Management | 3 |
| or HORT 842B | Plant Physiology | |
| HORT 843K | Advanced Arboriculture | 3 |
| Electives (6 credits) | | 6 |
| HORT 814 | Turfgrass Disease Management | 1 |
| HORT 844B | Environmental Stress Physiology | 1 |
| HORT 880 | Modified Root Zones | 1 |
| HORT 888 | Entrepreneurship and Enterprise Development | 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 | |

Personal Leadership

To earn the Graduate Certificate in Personal Leadership:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/PRLE-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here, with grades of B or higher in all classes.

| Required Courses (6 credits) | | 6 |
|-------------------------------------|---|----------|
| ALEC 877 | Leadership and Motivation | 3 |
| ALEC 807 | Supervisory Leadership | 3 |
| Electives (6 credits) | | 6 |
| ALEC 810 | Environmental Leadership | 3 |
| ALEC 814 | Classic Figures in Leadership | 3 |
| ALEC 855 | Dynamics of Effective Leadership in Groups & Teams | 3 |
| ALEC 866 | Leadership and Diversity in Organizations and Communities | 3 |
| ALEC 888 | Leadership, Power and Influence | 3 |

Rural Economic and Community Vitality

To earn the Graduate Certificate in Rural Economic and Community Vitality:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/RECV-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here, with grades of B or higher in all classes.

| Required Courses (9 credits) | | 9 |
|-------------------------------------|--|----------|
| CDEV 814 | Community and Regional Economic Analysis | 3 |
| ALEC 855 | Dynamics of Effective Leadership in Groups & Teams | 3 |
| CDEV 894 | Practicum/Creative Component/Thesis in Community Development | 3 |
| Electives (3 credits) | | 3 |
| CDEV 816 | Nebraska Rural Government Law Fundamentals | 1 |
| CDEV 817 | Nebraska Rural Government Finance Fundamentals | 1 |
| CDEV 818 | Community Engagement | 1 |
| CDEV 819 | Community Action Strategies | 1 |
| CDEV 825 | Sustainable Economic Development | 1 |
| CDEV 826 | Fundamentals of Business Analysis | 1 |
| CDEV 827 | Community Workforce Development | 1 |

ARCHITECTURE

Urban Design

To earn the Graduate Certificate in Urban Design :

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/URDS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 14-15 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.

| Required Courses (6 credits) | | 6 |
|-------------------------------------|---|------------|
| CRPL 800 | Introduction to Planning | 3 |
| ARCH 861 | Urbanism | 3 |
| Electives (8-9 credits) | | 8-9 |
| ARCH 810 | Advanced Architectural Design I | 5-6 |
| & ARCH 811 | and Advanced Architectural Design II | |
| or ARCH 613 | Architectural Design Thesis I | |
| & ARCH 614 | and Architectural Design Thesis II | |
| CRPL 830 | Planning with GIS | 3 |
| CRPL 833 | GIS in Environmental Design and Planning | 3 |
| ARCH 562 | Urbanism and the Catalysts of Change | 3 |
| ARCH 863 | Project Territory <small>(available only to students stacking this certificate with M.Arch)</small> | 3 |
| CRPL 864 | Urban Design | 3 |
| ARCH 892 | Selected Topics in Architecture | 1-6 |
| CRPL 892 | Selected Topics in Community and Regional Planning | 1-9 |
| or CRPL 990 | Planning Studio | |

Arts and Sciences

Bioanalytical Chemistry

To earn the Graduate Certificate in Bioanalytical Chemistry:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/BIOA-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours.

| Required courses (6 credits) | | 6 |
|--|---|----------|
| CHEM 821 | Analytical Chemistry | 3 |
| or CHEM 824 | Applied Problems in Analytical Chemistry | |
| CHEM 835 | Chemical Biology | 3 |
| <i>Select two of the following</i> (6 credits) | | 6 |
| CHEM 825D | Mass Spectrometry | 3 |
| CHEM 825G | Chromatographic Separations | 3 |
| CHEM 825K | Introduction to Nuclear Magnetic Resonance | 3 |
| CHEM 991A | Selected Topics in Analytical Chemistry (Biosensors) | 1-6 |
| Electives (6 credits) | | 6 |
| CHEM 825E | Data Handling and Statistics | 2 |
| CHEM 991E | Special Topics in Organic Chemistry (Introduction to Computational Chemistry) | 2-4 |
| CHEM 936 | Molecular Biology Methods | 2-3 |
| CHEM 871 | Physical Chemistry | 4 |
| CBIO 842 | Biosystems Research 2: Integrating Quantitative and Computational Biology into Life Sciences Research | 3 |
| BIOC 837 | Research Techniques in Biochemistry | 4 |
| CHEM 823 | Analytical Chemistry Laboratory | 2 |
| CHEM 898 | Special Problems (non-thesis research) | 1-6 |
| CHEM 825D | Mass Spectrometry (if not counted within core requirements) | 3 |
| CHEM 825G | Chromatographic Separations (if not counted within core requirements) | 3 |
| CHEM 991A | Selected Topics in Analytical Chemistry (other than Biosensors) | 1-6 |

Chromatography and Analytical Separations

To earn the Graduate Certificate in Chromatography and Analytical Separations:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/CHRM-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours.

| Required courses (12 credits) | | 12 |
|--------------------------------------|--|-----------|
| CHEM 821 | Analytical Chemistry | 3 |
| or CHEM 824 | Applied Problems in Analytical Chemistry | |
| CHEM 825G | Chromatographic Separations | 3 |
| CHEM 991A | Selected Topics in Analytical Chemistry | 2 |
| CHEM 825D | Mass Spectrometry | 3 |
| CHEM 825A | Ionic Equilibria | 1 |
| or CHEM 825E | Data Handling and Statistics | |

| Electives (6 credits) | | 6 |
|------------------------------|---|----------|
| CHEM 898 | Special Problems (non-thesis research) | 1-6 |
| CHEM 823 | Analytical Chemistry Laboratory | 2 |
| CHEM 835 | Chemical Biology | 3 |
| CHEM 982 | Chemical Thermodynamics | 3 |
| CHEM 984 | Chemical Kinetics | 2 |
| CHEM 991E | Special Topics in Organic Chemistry (Introduction to Computational Chemistry) | 2-4 |
| BIOC 837 | Research Techniques in Biochemistry | 4 |
| CHME 873 | Biochemical Engineering | 3 |
| CHME 874 | Advanced Biochemical Engineering | 2-6 |

Digital Humanities

To earn the Graduate Certificate in Digital Humanities:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/DIGH-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here with a grade of B or better. The certificate program is comprised of interdisciplinary coursework between: Anthropology; Art, Art History & Design; Classics & Religious Studies; English; History; Modern Languages; and University Libraries. Two specific courses are required; the remaining six credit hours may be drawn from courses approved by the Digital Humanities Program Coordinator Adrian S. Wisnicki awisnicki2@unl.edu. For further information about the certificate, see <https://www.unl.edu/dhcert/home> (<https://www.unl.edu/dhcert/home/>).

| Required Courses (6 credits) | | 6 |
|---|--|----------|
| ENGL 872 / HIST 872 / MODL 872 / ANTH 871 | Digital Humanities Practicum | 3 |
| ANTH 946 / ENGL 946 / HIST 946 / MODL 946 | Interdisciplinary Readings in Digital Humanities | 3 |
| Electives (6 credits) | | 6 |
| ANTH 886 | Digital Heritage | 3 |
| ENGL 877 | Advanced Topics in Digital Humanities | 3 |
| ENGL 878 | Digital Archives and Editions | 3 |
| HIST 970 | Seminar in Digital History | 3 |
| AHIS 806 / ANTH 806 / CLAS 806 | Visualizing the Ancient City | 3 |
| ANTH 816 | Digital Anthropologies | 3 |
| ANTH 884 | Data Analytics in Anthropology | 3 |
| GEOG 817 | Web GIS | 3 |
| GEOG 825 | Geovisualization | 3 |
| MODL 891 | Special Topics in Modern Languages | 3 or 6 |
| ADPR 866 | Social Media Theory and Practice | 3 |

Forensic Anthropology

To earn the Graduate Certificate in Forensic Anthropology:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FORA-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours.

| Required Courses (9 credits) | | 9 |
|------------------------------|--|---|
| ANTH 844 | Human Osteology | 3 |
| ANTH 862 | Forensic Anthropology | 3 |
| ANTH 887D | Analysis of Archaeological Materials - Archaeofauna | 3 |
| Electives (9 credits) | | 9 |
| ANTH 843 | Dental Anthropology | 3 |
| ANTH 855 | Forensic Archaeology: Clandestine Burials, Mass Graves, and Human Rights | 3 |
| ANTH 856 | Forensic Taphonomy: an Anthropological Approach | 3 |
| ANTH 884 | Data Analytics in Anthropology | 3 |
| ANTH 897 | Advanced Fieldwork | 3 |
| ANTH 895 | Internship in Anthropology | 3 |
| ANTH 945 | Seminar in Bioanthropology | 3 |

Geographic Information Science

To earn the Graduate Certificate in Geographic Information Science:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/GISC-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 22 credit hours and a comprehensive examination.

| Required Courses (6-14 credits, choose at least 2) | | 6-14 |
|--|---|------|
| GEOG 817 | Web GIS | 3 |
| GEOG 822 | Advanced Techniques in Geographic Information Systems | 4 |
| GEOG 825 | Geovisualization | 4 |
| GEOG 832 | Programming, Scripting, and Automation for GIS | 3 |
| Electives (8-16 credits) | | 8-16 |
| GEOG 820 / NRES 818 | Digital Image Analysis of Remote Sensing Data | 4 |
| GEOG 819 / NRES 820 | Applications of Remote Sensing in Agriculture and Natural Resources | 4 |
| GEOG 827 / NRES 827 | Introduction to the Global Positioning System (GPS) | 2 |
| GEOG 844 | Geo-demographic and Geographic Information Systems (GIS) | 3 |
| GEOG 861 / ANTH 861 | Geospatial Approaches in Digital Humanities and Social Sciences | 3 |
| GEOG 891 | Special Topics in Geography | 2-3 |
| 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 832 | Advanced Spatial Analysis with GIS | 3 |
| CRPL 833 | GIS in Environmental Design and Planning | 3 |
| CRPL 892 | Selected Topics in Community and Regional Planning | 1-9 |
| NRES 815 | GIS for Agriculture and Natural Resources | 4 |
| STAT 831 | Spatial Statistics | 3 |

Museum Studies

To earn the Graduate Certificate in Museum Studies:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/MUSS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours.

| Required Courses (18 credits) | | 18 |
|-------------------------------|---|-----|
| ANTH 818 | Ethnology and Museums | 3 |
| ANTH 886 | Digital Heritage | 3 |
| ANTH 887 | Analysis of Archaeological Materials | 3 |
| ANTH 895 | Internship in Anthropology | 1-6 |
| ANTH 898 | Research | 1-6 |
| ANTH 835 | Heritage Resource Protection and Management | 3 |

Teaching of Writing

To earn the Graduate Certificate in Teaching of Writing:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/TWRT-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete a minimum of 5 courses equating to 15-18 credit hours. This may include up to 6 credit hours from outside the English Department.

| Required Courses (3-6 credits) | | 3-6 |
|--|---|------|
| ENGL 857A | Composition and Rhetorical Theory | 3-4 |
| ENGL 957 | Composition Theory and Practice | 1-6 |
| ENGL 957B | Nebraska Writing Project | 6 |
| Electives (credits 9-15, Maximum 6 credits outside of English) | | 9-15 |
| ENGL 857 | Composition Theory and Practice | 3 |
| ENGL 857B | Nebraska Writing Project | 1-3 |
| ENGL 875 | Rhetoric | 3 |
| ENGL 875A | Rhetorical Theory: Rhetoric of Women Writers | 3 |
| ENGL 895 | Internship in English | 1-3 |
| ENGL 895A | Nebraska Writing Project Internship | 1-3 |
| ENGL 880 | Writing Center Theory, Practice, and Research | 3 |
| ENGL 882 | Literacy Issues and Community | 3-6 |

| | | |
|-----------|--|------|
| ENGL 973 | Seminar in Literacy Studies | 1-24 |
| ENGL 976 | Seminar in Rhetorical Theory | 1-24 |
| ENGL 992B | Place Conscious Teaching | 1-6 |
| TEAC 813 | Studies in Teaching English as a Second Language | 1-15 |
| TEAC 818 | Teaching Writing in K-12 Schools | 3 |
| TEAC 838 | Linguistics in Language and Learning Contexts | 3 |
| TEAC 840 | Culture and Schooling | 3 |
| TEAC 921 | Seminar in Literacy Studies | 3 |
| TEAC 950 | Contextual Research in English/Language Arts | 3 |
| TEAC 952 | Language and Learning | 3 |
| TEAC 953 | Seminar on Writing in the Curriculum | 3 |

Business Administration

Business Analytics

To earn the Graduate Certificate in Business Analytics:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/BSAN-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below, **in this sequence starting with GRBA 851**.

| | | |
|--|---------------------------------------|---|
| Required courses (6 credits) | 6 | |
| GRBA 851 | Business Analytics | 3 |
| ECON 817 | Introductory Econometrics | 3 |
| Electives (6 credits) | 6 | |
| Preferred (3-6 credits) | 3-6 | |
| SCMA 851 | Predictive Analytics | 3 |
| SCMA 853 | Data Mining and Descriptive Analytics | 3 |
| Optional (3 credits - If only one of the above courses is taken) | 3 | |
| SCMA 837 | Risk and Simulation Modeling | 3 |
| SCMA 852 | Data Management and Organization | 3 |
| SCMA 854 | Advanced Analytics and Big Data | 3 |
| SCMA 855 | Prescriptive Analytics | 3 |

Financial Analytics

To earn the Graduate Certificate in Financial Analytics:

1. Learn More (<https://graduate.unl.edu/academics/programs/FNAN-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below.

| | | |
|---|---------------------------------|---|
| Required Courses (6 credits) | 6 | |
| FINA 801 | Quantitative Methods in Finance | 3 |
| SCMA 851 | Predictive Analytics | 3 |
| Electives (6 credits, choose only one FINA course and one SCMA course) | 6 | |
| FINA 802 | Fixed Income Analysis | 3 |

| | | |
|----------|--|---|
| FINA 863 | Portfolio Management | 3 |
| FINA 867 | Options, Futures and Derivative Securities | 3 |
| SCMA 837 | Risk and Simulation Modeling | 3 |
| SCMA 853 | Data Mining and Descriptive Analytics | 3 |
| SCMA 854 | Advanced Analytics and Big Data | 3 |

Financial Communications

To earn the Graduate Certificate in Financial Communications:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FNCO-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below.

| | | |
|-------------------------------------|--|---|
| Required Courses (6 credits) | 6 | |
| JOMC 820 | Financial Communications | 3 |
| GRBA 808 | Introduction to Business Strategy | 3 |
| Electives (6 credits) | 6 | |
| ADPR 850 | Public Relations Management and Case Studies | 3 |
| or JGRD 819 | Graduate Writing, Reporting and Editing | |
| GRBA 809 | Financial Accounting | 3 |
| or GRBA 811 | Managerial Finance | |

Human Resources Management

To earn the Graduate Certificate in Human Resources Management:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/HRES-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below.

| | | |
|---------------------------------------|---|---|
| Required Courses (3 credits) | 3 | |
| GRBA 816 | Strategic Human Resource Management | 3 |
| Electives (9 credits) | 9 | |
| Preferred | | |
| MNGT 863 | Compensation Administration | 3 |
| MNGT 864 | Talent Acquisition and Staffing | 3 |
| MNGT 866 | The Regulatory Environment for Employment and Labor | 3 |
| Optional (if preferred not available) | | |
| MNGT 859 / | Managerial Negotiations | 3 |
| MRKT 859 | | |
| MNGT 817 | Positivity for Managers | 3 |

Marketing Analytics

To earn the Graduate Certificate in Marketing Analytics:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/MRKA-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).

3. Consult an advisor to develop a plan of study.
4. Complete 12 credits hours as listed below.

| | |
|--|----------|
| Required Courses (6 credits) | 6 |
| GRBA 813 Managerial Marketing | 3 |
| GRBA 851 Business Analytics | 3 |
| Electives (6 credits) | 6 |
| MRKT 821 Applied Marketing Research | 3 |
| MRKT 824 Advanced Quantitative Analysis in Marketing | 3 |
| MRKT 845 Advanced Marketing Analytics | 3 |
| MRKT 850 Data-Driven Decision Making | 3 |

Sales Excellence

To earn the Graduate Certificate in Sales Excellence:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/SALE-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credits hours as listed below.

| | |
|--------------------------------------|----------|
| Required Course (3 credits) | 3 |
| GRBA 813 Managerial Marketing | 3 |
| Electives (9 credits) | 9 |
| MRKT 850 Data-Driven Decision Making | 3 |
| MRKT 857 Consultative Selling | 3 |
| MRKT 858 Sales Leadership | 3 |
| MRKT 859 Managerial Negotiations | 3 |

Strategic Innovation and Entrepreneurship

To earn the Graduate Certificate in Strategic Innovation and Entrepreneurship:

1. Learn More (<https://graduate.unl.edu/academics/programs/SIEN-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below.

| | |
|--|----------|
| Required Courses (6 credits) | 6 |
| GRBA 808 Introduction to Business Strategy | 3 |
| GRBA 853 Strategic Management and Business Policy | 3 |
| Electives (6 credits) | 6 |
| MNGT 818 Organization Designs for Competitive Advantage | 3 |
| ENTR 821 Identifying and Exploring Entrepreneurial Opportunities | 3 |
| ENTR 822 Managing Rapid Growth and Change in Organizations | 3 |
| ENTR 823 Business Plan Development and Decision Making | 3 |
| MNGT 840 Corporate Strategy and Entrepreneurship | 3 |

Strategic Marketing

To earn the Graduate Certificate in Strategic Marketing:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/STMK-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below.

| | |
|--|----------|
| Required Courses (6 credits) | 6 |
| GRBA 813 Managerial Marketing | 3 |
| Electives (6 credits) | 6 |
| MRKT 821 Applied Marketing Research | 3 |
| MRKT 822 Survey of Buyer Behavior | 3 |
| MRKT 826 Services Marketing | 3 |
| MRKT 828 Sports Marketing | 3 |
| MRKT 830 Strategic Issues in Marketing Communication | 3 |
| MRKT 835 Marketing Channels and Distribution | 3 |
| MRKT 841 Digital Marketing and Electronic Commerce | 3 |
| MRKT 855 Marketing and Globalization | 3-6 |

Supply Chain Analytics

To earn the Graduate Certificate in Supply Chain Analytics:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/SCAN-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below. GRBA 815 and GRBA 851 plus 2 of the other 6 courses listed.

| | |
|--|----------|
| Required Courses (6 credits) | 6 |
| GRBA 815 Supply Chain Management Strategies | 3 |
| GRBA 851 Business Analytics | 3 |
| Electives (6 credits) | 6 |
| SCMA 831 Advanced Enterprise Systems | 3 |
| SCMA 836 Project Management and Implementation | 3 |
| SCMA 837 Risk and Simulation Modeling | 3 |
| SCMA 851 Predictive Analytics | 3 |
| SCMA 853 Data Mining and Descriptive Analytics | 3 |
| SCMA 855 Prescriptive Analytics | 3 |

Supply Chain Management Systems

To earn the Graduate Certificate in Supply Chain Management Systems:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/SCMS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours (grade must be a B or better).

| | |
|---|----------|
| Required Courses (3 credits) | 3 |
| GRBA 815 Supply Chain Management Strategies | 3 |

| Electives (9 credits) | | 9 |
|------------------------------|--|----------|
| 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 836 | Project Management and Implementation | 3 |
| SCMA 839 | Global Supply Chain Management | 3 |
| SCMA 844 | Managing Logistics in the Supply Chain | 3 |
| SCMA 847 | Information Technologies for Operations and Innovation | 3 |

Education and Human Sciences

Community College Leadership

To earn the Graduate Certificate in Community College Leadership:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/CCLD-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described here.

| Required Courses (15 credits) | | 15 |
|--------------------------------------|---|-----------|
| EDAD 923 | The Community/Junior College | 3 |
| EDAD 929 | Organizational Theory 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/ECSE-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as listed below, (grade must be a B or better).

| Required Courses (12 credits) | | 12 |
|--------------------------------------|--|-----------|
| SPED 860 | Issues in Early Childhood Special Education | 3 |
| SPED 861 | Infants with Disabilities and Home Visiting | 3 |
| or SPED 862 | Preschool Children with Disabilities | |
| SPED 960 | Family and School Collaboration in Special Education | 3 |
| SPED 863 | Medically Fragile infants | 3 |
| or SPED 882 | Severe Multiple Disabilities: Methods | |

Early Literacy

To earn the Graduate Certificate in Early Literacy:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/ELIT-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 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 Courses (10-12 credits) | | 10-12 |
|---|---|--------------|
| TEAC 802 | Contemporary Children's Literature: Principles and Practices | 3 |
| TEAC 854 | Multiethnic Literature for Children & Adolescents | 3 |
| TEAC 817 | Emerging Reading and Language | 3 |
| TEAC 813A | Second Language Acquisition | 1-3 |
| or TEAC 811 | Reading Processes and Practices | |
| Electives (6-8 credits) | | 6-8 |
| 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 |
| SPED 815 | Reading and Writing Disabilities: Elementary Students | 2 |
| or SPED 815A | Practicum in Reading and Writing Disabilities-Elementary | |

Educational Neuroscience

To earn the Graduate Certificate in Educational Neuroscience:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/EDNR-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours of electives approved by the Certificate Program Advisor.

| Required Courses (12 credits) | | 12 |
|--------------------------------------|--|-----------|
| PSYC 865 | Behavioral Neuroscience | 3 |
| EDPS 991 | Seminar in Educational Psychology and Measurements | 3 |
| EDPS 922 | Mind, Brain, and Education | 3 |
| SLPA 995 | Doctoral Seminar (Neural Basis of Reading) | 3 |
| SLPA 995 | Doctoral Seminar (Neuroimaging & Language Disorders) | 3 |

Courses Taught at UNMC

| | |
|---------|-------------------------|
| NSC 820 | Methods in Neuroscience |
| NSC 932 | Systems Neuroscience |

Family Financial Planning

To earn the Graduate Certificate in Family Financial Planning:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FFPL-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours as listed here.

| Required Courses (18 credits) | | 18 |
|--------------------------------------|--|-----------|
| CYAF 821 | FFPLN: Insurance Planning for Families | 3 |
| CYAF 823 | FFPLN: Estate Planning for Families | 3 |
| CYAF 828 | FFPLN: Retirement Planning, Employee Benefits and the Family | 3 |
| CYAF 836 | FFPLN: Financial Planning Case Studies | 3 |
| CYAF 840 | FFPLN: Personal Income Taxation | 3 |
| CYAF 883 | FFPLN: Investing for the Family's Future | 3 |

Financial Counseling

To earn the Graduate Certificate in Financial & Housing Counseling:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/FHOC-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours as listed below.

| Required Courses (12 credits) | | 12 |
|--------------------------------------|--|-----------|
| CYAF 825 | FCSE: Reading in the Content Area | 3 |
| CYAF 822 | FFPLN: Financial Counseling | 3 |
| CYAF 824 | FFPLN: Fundamentals of Financial Planning | 3 |
| CYAF 841 | FFPLN: Housing/Real Estate | 3 |
| Electives (6 credits) | | 6 |
| CYAF 821 | FFPLN: Insurance Planning for Families | 3 |
| CYAF 823 | FFPLN: Estate Planning for Families | 3 |
| CYAF 826 | FFPLN: Military Personal Financial Readiness | 3 |
| CYAF 828 | FFPLN: Retirement Planning, Employee Benefits and the Family | 3 |
| CYAF 840 | FFPLN: Personal Income Taxation | 3 |
| CYAF 883 | FFPLN: 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/K3MS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credit hours as listed below. The required courses should be completed prior to registering for electives.

| Required Courses (9 credits) | | 9 |
|-------------------------------------|--|----------|
| MATH 800P | Number and Operation for K-3 Mathematics Specialists | 3 |

| 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 |
| Electives (9 credits) | | 9 |
| TEAC 807A | Equitable Practices in Mathematics Education: Identity, Access, & Equity in Mathematics Education | 3 |
| TEAC 807B | Equitable Practices in Mathematics Education: Teaching Mathematics for Social Justice | 3 |
| TEAC 807C | Equitable Practices in Mathematics Education: Mathematics Classroom Discourse | 3 |
| TEAC 808G | Improvement of Instruction in School Mathematics: Manipulatives in Mathematics Education | 3 |
| TEAC 808J | Improvement of Instruction in School Mathematics Special Topics | 3 |
| TEAC 836G | Professional Development: Mathematics Education Leadership | 3 |
| TEAC 848G | Introduction to Curriculum Studies: Mathematics Curriculum Analysis & Design | 3 |
| TEAC 849G | Studies in Assessment and Leadership for Learning: Assessment in Mathematics Education | 3 |
| TEAC 856P | Learning Models: Theories and Applications Specific to Mathematics Instruction | 3 |
| TEAC 880E | Teaching with Technology: Instructional Technology in Mathematics | 1-3 |

Mathematics Education

To earn the Graduate Certificate in Mathematics Education:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/MAED-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described.

| Required Courses (15 credits - 12 must be from TEAC) | | 15 |
|---|---|-----------|
| TEAC 807A | Equitable Practices in Mathematics Education: Identity, Access, & Equity in Mathematics Education | 3 |
| TEAC 807B | Equitable Practices in Mathematics Education: Teaching Mathematics for Social Justice | 3 |
| TEAC 807C | Equitable Practices in Mathematics Education: Mathematics Classroom Discourse | 3 |
| TEAC 808G | Improvement of Instruction in School Mathematics: Manipulatives in Mathematics Education | 3 |
| TEAC 836G | Professional Development: Mathematics Education Leadership | 3 |

| | | |
|-----------|--|-----|
| TEAC 848G | Introduction to Curriculum Studies: Mathematics Curriculum Analysis & Design | 3 |
| TEAC 849G | Studies in Assessment and Leadership for Learning: Assessment in Mathematics Education | 3 |
| TEAC 880E | Teaching with Technology: Instructional Technology in Mathematics | 1-3 |
| TEAC 856P | Learning Models: Theories and Applications Specific to Mathematics Instruction | 3 |
| TEAC 907 | Seminar in Elementary School Mathematics | 3 |
| CYAF 890A | Workshop Seminar: Early Childhood | 1-3 |
| MATH 800T | Mathematics as a Second Language | 3 |
| MATH 802T | Functions, Algebra, and Geometry for Middle Level Teachers | 3 |
| MATH 803P | Algebraic Thinking in the Elementary Classroom | 3 |
| MATH 804P | Problem Solving and Critical Thinking in the Elementary Classroom | 3 |
| MATH 804T | Experimentation, Conjecture and Reasoning | 3 |
| MATH 805T | Discrete Mathematics for Middle Level Teachers | 3 |
| MATH 806T | Number Theory and Cryptology for Middle Level Teachers | 3 |
| MATH 807T | Using Mathematics to Understand Our World | 3 |
| MATH 808T | Concepts of Calculus for Middle Level Teachers | 3 |
| MATH 810T | Algebra for Algebra Teachers | 3 |
| MATH 811T | Functions for High School Teachers | 3 |
| MATH 812T | Geometry for Geometry Teachers | 3 |
| MATH 814T | Linear Algebra for Teachers | 3 |
| MATH 816T | Math in the City for Teachers | 3 |
| STAT 812T | Statistics for High School Teachers | 3 |

Medical Family Therapy

To earn the Graduate Certificate in Medical Family Therapy:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/MFTH-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. 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.

4. 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/MMRS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Upon admission, complete 15 credit hours as described here, with a grade of B or better in each course.

Required Courses ^(12 credits)

| | | |
|-------------------------------------|---|----|
| Statistics: Choose 1 course (3 cr) | | 12 |
| 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 course (3 cr) | | 3 |

| | | |
|---|--|----------|
| EDPS 870 | Introduction to Educational and Psychological Measurement ¹ | 3 |
| EDPS 970 | Theory and Methods of Educational Measurement | 3 |
| Qualitative Methods: Choose 1 course (3 cr) | | |
| EDPS 900K | Qualitative Approaches to Educational Research ¹ | 3 |
| EDPS 935 | Seminar in Qualitative Research ¹ | 3 |
| EDPS 930A | Ethnographic Methods | 3 |
| EDPS 930D | Discourse Analysis Across School, Home and Community Settings | 3 |
| Mixed Methods: Choose 1 course (3 cr) | | |
| EDPS 936 | Mixed Methods Research ¹ | 3 |
| Elective (3 credits) | | 3 |
| Choose one additional course from the Statistics, Measurement, or Qualitative Methods sections. | | |

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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/NNEV-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 18 credits hours as listed below with a grade of B or better.

| | | |
|--|--|-----------|
| Required Courses (18 credits - Select one course from each competency, an additional course from a competency may be required to meet 18 credits) | | 18 |
| RNA Biology Competency (3 credits) | | |
| BIOS 945 | RNA Biology | 3 |
| Bioinformatics Competency (3 credits) | | |
| BIOS 826 | Systems Biology | 3 |
| BIOS 827 | Practical Bioinformatics Laboratory | 3 |
| BIOS 828 | Perl Programming for Biological Applications | 3 |
| CSCE 823 | Design and Analysis of Algorithms | 3 |
| CSCE 871 | Computational Methods in Bioinformatics | 3 |
| CSCE 896 | | |
| Human Nutrition Competency (2-3 credits) | | |
| NUTR 820 | Molecular Nutrition | 2 |
| NUTR 821 | Molecular Nutrition Techniques | 3 |
| NUTR 950 | Integrated Principles of Human Nutrition | 3 |
| Cell Biology Competency (3 credits) | | |
| BIOS 807 | Biology of Cells and Organelles | 3 |
| BIOS 820 | Molecular Genetics | 3 |
| Health and Disease Competency (3 credits) | | |
| BIOC 935 | Metabolic Function and Dysfunction | 3 |
| Research Ethics & Management ^(1 or 3 credits) | | 1-3 |

| | | |
|----------|-----------------|---|
| AGRO 803 | | |
| BIOS 809 | Professionalism | 1 |

Social Justice and Diversity Education

To earn the Graduate Certificate in Social Justice and Diversity Education:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/SJUS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described here: two required courses and three elective approved by the Certificate Program Advisor.

| | | |
|---|---|----------|
| Required Courses (6 credits, an additional 6 credits may be taken) | | 6 |
| TEAC 813J | Intercultural Communication | 3 |
| TEAC 861 | Education for a Pluralistic Society: Foundation and Issues | 3 |
| TEAC 862 | Seminar in Democratic Education | 3 |
| TEAC 944B | Special Topics in Curriculum | 1-3 |
| TEAC 949B | Critical, Anti-colonial, & Decolonizing Theories in Education | 3 |
| Electives (3-9 credits) | | |
| 3-9 | | |
| TEAC 807A | Equitable Practices in Mathematics Education: Identity, Access, & Equity in Mathematics Education | 3 |
| TEAC 807B | Equitable Practices in Mathematics Education: Teaching Mathematics for Social Justice | 3 |
| TEAC 807C | Equitable Practices in Mathematics Education: Mathematics Classroom Discourse | 3 |
| TEAC 811 | Reading Processes and Practices | 1-6 |
| TEAC 815A | Foundations of Dual Language Education | 3 |
| TEAC 815J | Spanish in the Content Areas | 3 |
| TEAC 833B | Comparative Education: Special Topics/Travel Study | 3-9 |
| TEAC 833 | Comparative Education | 3 |
| TEAC 838 | Linguistics in Language and Learning Contexts | 3 |
| TEAC 840D | Culture and Schooling: Special Topics | 1-6 |
| TEAC 840M | Language and Power | 3 |
| TEAC 887 | Effecting High School Improvement | 3 |
| TEAC 908J | Critical Conversations in U.S. Teacher Preparation Policy and Practice: Teacher Education To What E | 3 |
| TEAC 921D | Seminar in Literacy Studies: Language, Culture, and Education | 1-9 |
| TEAC 930M | Introduction to Multimodal Textual Analysis | 3 |
| TEAC 936 | Seminar in College Teaching | 1-3 |
| TEAC 944 | Seminar in Curriculum Studies | 1-3 |

Quilt Studies

To earn the Graduate Certificate in Quilt Studies:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/QLTS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here: three required courses and one elective approved by the Certificate Program Advisor.

| | |
|--|----------|
| Required Courses (9 credits) | 9 |
| TMFD 818 Quilts, History, Culture | 3 |
| TMFD 905A Advanced Problems: Textiles | 1-6 |
| TMFD 905D Advanced Problems: Design | 1-6 |
| Electives (3 credits) | 3 |
| 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 |

Response to Intervention: Reading

To earn the Graduate Certificate in Response to Intervention: Reading

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/RINR-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 13-15 credit hours as described here: two core courses, one required workshop, and two other TEAC/SPED courses.

| | |
|--|------------|
| Required Courses (9 credits) | 9 |
| TEAC 811A Teaching Reading | 3 |
| TEAC 841 Content Area Reading, Grades 4-12 | 3 |
| TEAC 802 Contemporary Children's Literature: Principles and Practices | 3 |
| or TEAC 839 Literature for Adolescents | |
| Electives Choose two courses (6-7 credits); at least one of the two elective courses must be a TEAC course. | 6-7 |
| TEAC 806 and TEAC 806A must be taken together, 4 cr | |
| TEAC 806 Reading and Writing Disabilities: Adolescents | |
| TEAC 806A Reading Center Practicum II | |
| TEAC 811 Reading Processes and Practices (other than Response to Intervention) | 3 |
| TEAC 817 Emerging Reading and Language | 3 |
| TEAC 836A Professional Development: Literacy Coaching | 3 |
| TEAC 838 Linguistics in Language and Learning Contexts | 3 |
| TEAC 854 Multiethnic Literature for Children & Adolescents | 3 |

| | |
|---|---|
| TEAC 886 Assessment, Evaluation, and Instruction of At-Risk Readers (specific section must be approved for inclusion by the advisory committee) | 3 |
| SPED 886A Special Topics in Literacy Assessment | 3 |

Sensory Disabilities

To earn the Graduate Certificate in Sensory Disabilities:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/SDIS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here.

| | |
|---|-----------|
| Required Courses (12 credits) | 12 |
| SPED 846 Visual Impairments: Characteristics | 3 |
| SPED 872 Deaf or Hard of Hearing: Characteristics | 3 |
| SPED 960 Family and School Collaboration in Special Education | 3 |
| or SPED 860 Issues in Early Childhood Special Education | |
| or SPED 861 Infants with Disabilities and Home Visiting | |
| or SPED 863 Medically Fragile infants | |
| SPED 852 Visual Impairments: Methods | 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/TESO-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described below with a B or better grade and no less than a 3.25 GPA.

| | |
|---|----------|
| Required Courses (9 credits) | 9 |
| TEAC 813A Second Language Acquisition | 3 |
| TEAC 813K Linguistics for Language Teachers | 3 |
| TEAC 813P Teaching English as an International Language | 3 |
| or TEAC 813B ESL: Teaching and Curriculum | |
| Electives (3 credits) | 3 |
| TEAC 813D World Languages Assessment | 1-3 |
| TEAC 813E Special Topics in TESOL | 1-3 |
| 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 |
| TEAC 897E Student Teaching Internship: English as a Second Language | 1-3 |

| | | |
|-----------|---|-----|
| TEAC 838 | Linguistics in Language and Learning Contexts | 3 |
| TEAC 921D | Seminar in Literacy Studies: Language, Culture, and Education | 1-3 |

World Language Teaching: German

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

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/WLTG-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described below.

Required Courses (15 credits - choose 15 credits from the following) **15**

| | | |
|-----------|---|---|
| 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 922E | Teaching for Intercultural Communicative Competence in the German Language Classroom | 3 |
| TEAC 922L | Interpersonal and Presentational Speaking in the German Language Classroom | 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. Learn More (<https://www.unl.edu/gradstudies/academics/programs/WLTS-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described below.

Required Courses (15 credits - choose 15 credits from the following) **15**

| | | |
|-----------|---|---|
| TEAC 922A | Teaching for Intercultural Communicative Competence in the Spanish Language Classroom | 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 922K | Interpersonal and Presentational Speaking 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 922 | Seminar in the Learning and Teaching of Foreign Languages | 3 |

Youth Development

To earn the Graduate Certificate in Youth Development:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/YTHD-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study and choose a focus: Youth Development Specialist or Youth Program Management and Evaluation.
4. 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.*

Required Courses (7 credits - for either focus 7 credits must include 1 hour foundations course.) **7**

| | | |
|--|--|---|
| CYAF 861 | YD: Foundational Skills in Positive Youth Development | 3 |
| Youth Development Specialist | | |
| CYAF 872 | YD: Youth Development | 3 |
| Youth Program Management & Evaluation | | |
| CYAF 873 | FAM/YD: Program Design, Evaluation and Implementation (UNL) | 3 |
| CYAF 869 | FAM/YD: Administration and Program Management (UNL or Kansas State Univ) | 3 |
| Electives: Youth Development Specialist focus (6 credits) 6 | | |
| CYAF 878 | YD: Youth Policy (Michigan State Univ) | 3 |
| CYAF 875 | YD: Youth in Cultural Contexts (Michigan State Univ) | 3 |
| CYAF 866 | | |
| Electives: Youth Program Management and Evaluation focus (3 credits) 3 | | |
| CYAF 863 | YD: Youth Professionals as Consumers of Research (UNL) | 3 |
| CYAF 878 | YD: Youth Policy | 3 |
| CYAF 842 | | |
| CYAF 866 | | |

Engineering

Additive Manufacturing

To earn the Graduate Certificate in Construction Engineering & Management:

1. Learn More (<https://graduate.unl.edu/academics/programs/ADMA-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described below with a grade of B or better.

| | |
|--|----------|
| Required Courses (3 credits) | 3 |
| MECH 872 Additive Manufacturing | 3 |
| Electives (9 credits) | 9 |
| MECH 822 Industrial Quality Control | 3 |
| MECH 820 Heat Transfer | 3 |
| MECH 851 Introduction to Finite Element Analysis | 3 |
| MATL 860 Mechanical Aspects of Materials | 3 |
| MATL 865 Applied Physical Metallurgy and Design | 3 |

Construction Engineering & Management

To earn the Graduate Certificate in Construction Engineering & Management:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/CEMT-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described below with a grade of B or better.

| | |
|--|-----|
| CNST 811 Project Administration | 3 |
| CNST 815 Mechanical/Electrical Project Management | 3 |
| CNST 820 Professional Practice and Ethics | 3 |
| CNST 825 Alternative Project Delivery Methods | 3 |
| CNST 826 Occupational Health and Safety for Construction | 3 |
| CNST 834 The Design-Build Project Delivery System | 3 |
| CNST 836 Intent and Application of International Building Code | 3 |
| CNST 844 Construction Site Safety Management | 3 |
| CNST 850 Sustainable Construction | 3 |
| CNST 860 Construction Visualization and Simulation | 3 |
| CNST 880 Productivity and Human Factors in Construction | 3 |
| CNST 882 Heavy and/or Civil Construction | 3 |
| CNST 885 Construction Planning, Scheduling, and Controls | 3 |
| CNST 886 Construction Management Systems | 3 |
| CNST 887 Construction Leadership and Strategic Planning | 3 |
| CNST 890 Masters Project | 3 |
| CNST 895 Graduate Internship | 3 |
| CNST 898 / CONE 898 Special Topics in Construction Management ** | 1-6 |
| CONE 817 Formwork Systems | 3 |
| CONE 821 Construction Risk Assessment and Management | 3 |

| | |
|---|---|
| CONE 859 BIM I: Introduction to Building Information Modeling (BIM) | 3 |
| CONE 866 Heavy and/or Civil Estimating | 3 |
| CONE 883 Support of Excavation | 3 |
| CONE 895 Graduate Internship | 3 |

**Indicates a course that may count as a graduate credit "only" course. The student must work with their advisor, the graduate committee chair, and the course instructor to determine the status of the section taken. A written contract is required.

Engineering Management

To earn the Graduate Certificate in Engineering Management:

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/EMGT-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 15 credit hours as described below.

| | |
|---|----------|
| Required Courses (6 credits) | 6 |
| EMGT 805 Teamwork for Organizational Commitment and Collaboration | 3 |
| EMGT 806 Decision and Risk Analysis | 3 |
| Electives (9 credits) | 9 |
| EMGT 803 Management of Engineering and Technology | 3 |
| EMGT 804 Human Relations in Engineering and Sciences | 3 |
| EMGT 807 Project Management | 3 |
| EMGT 808 Engineering Leadership | 3 |
| EMGT 811 Legal Considerations for Engineering Managers | 3 |
| EMGT 819 Applied Management Science for Engineering and Operations | 3 |
| EMGT 822 Production and Operations Management | 3 |
| EMGT 820 Quantitative Analysis for Engineering Management Decisions | 3 |
| EMGT 891 Special Topics in Engineering Management | 3 |
| EMGT 901 Total Quality Management Using Six Sigma Techniques | 3 |
| EMGT 905 Strategic Management and Planning | 3 |

Journalism and Mass Communications Public Relations and Social Media

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

1. Learn More (<https://www.unl.edu/gradstudies/academics/programs/PRSM-GCER/>).
2. Apply for Admission (<https://www.unl.edu/gradstudies/admissions/steps/>).
3. Consult an advisor to develop a plan of study.
4. Complete 12 credit hours as described here, with grades of B or higher in all classes.

| Required courses (12 credits) | | 12 |
|-------------------------------|---|----|
| ADPR 830 | Strategic Communications: Advertising Issues and Strategies | 3 |
| ADPR 834 | Digital Insight & Analytics | 3 |
| ADPR 850 | Public Relations Management and Case Studies | 3 |
| ADPR 866 | Social Media Theory and Practice | 3 |

Nebraska Department of Education Certifications

The University of Nebraska–Lincoln offers courses to meet the following NDE Administrative and Teaching Certification requirements.

Administrative Endorsements

- Renewal
- Principal (Grades PK-8)
- Principal (Grades 7-12)
- Special Education Supervisor (Birth-12)
- Superintendent (Grades PK-12)

Teaching Endorsements: Initial teacher certification

- Renewal
- Biology 7-12
- Chemistry 7-12
- English Language Arts 7-12
- Elementary Education K-6
- Secondary English 7-12
- Earth and Space Science 7-12
- Family and Consumer Sciences 6-12
- Mathematics 6-12
- Physics 7-12
- Science 7-12
- School Counselor PK-8
- School Counselor 7-12
- Special Education: Early Childhood B-K
- Special Education Generalist K-6
- Special Education Generalist 7-12
- Speech Language Pathologist B-21
- School Psychologist PK-12
- World Language: French 7-12
- World Language: German 7-12
- World Language: Spanish 7-12

Teaching Endorsements: Added endorsements

- Bilingual Education K-6
- Bilingual Education 7-12
- Biology 7-12
- Chemistry 7-12
- English as a Second Language PK-6

- English as a Second Language 7-12
- Earth and Space Science 7-12
- Family and Consumer Sciences (6-12)
- Information Technology PK-12
- Instructional Technology Leadership PK-12
- Math (6-12)
- Orientation and Mobility Specialist
- Physics 7-12
- Reading Specialist PK-12
- Special Education: Deaf or Hard of Hearing B-12
- Special Education: Early Childhood B-K
- Special Education: Early Intervention Specialist B-PK
- Special Education: Visual Impairment B-12

Contact:

Sara Skretta (<https://directory.unl.edu/people/sskretta2/>)
 Certification Officer
 402-472-8626 | sskretta2@unl.edu

Archived Catalogs

Please refer to the current graduate catalog for policies in effect.

- Graduate Catalog 2021-2022 (PDF) (https://www.unl.edu/gradstudies/catalog/UNL_Graduate_Studies_Catalog-2021_2022.pdf)
- Graduate Catalog 2020-2021 (PDF) (https://www.unl.edu/gradstudies/catalog/UNL_Graduate_Studies_Catalog-2020-2021.pdf)
- Graduate Catalog 2019-2020 (PDF) (https://www.unl.edu/gradstudies/catalog/UNL_Graduate_Studies_Catalog-2019_2020.pdf)
- Graduate Catalog 2018-2019 (PDF) (https://www.unl.edu/gradstudies/catalog/UNL_Graduate_Studies_Catalog-2018_2019.pdf)
- Graduate Catalog 2017-2018 (PDF) (<https://www.unl.edu/gradstudies/catalog/UNL%20Graduate%20Studies%20Catalog.pdf>)
- 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>)

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