

Eberly College of Arts and Sciences

The Eberly College of Arts and Sciences, West Virginia University's largest college, has approximately 460 faculty in academic departments and program areas in the following: literature and the humanities, social and behavioral sciences, and mathematics and natural sciences. These departments occupy twelve buildings on the Downtown campus and include programs that lead to master's degrees in twenty fields and doctoral degrees in twelve fields. Many of the faculty have earned distinguished national and international reputations and have been honored for excellence in teaching, research, and service. Their awards not only acknowledge extreme dedication but also accentuate the relationship between the faculty and students. Graduate students often collaborate with faculty on specialized research projects which lead to publications in national and international journals.

Degrees Offered

- Master of Science, Doctor of Philosophy in Biology
- Master of Science, Doctor of Philosophy in Chemistry
- Master of Arts (online), Doctor of Philosophy in Communication Studies
- Master of Arts in English, Professional Writing and Editing; Master of Fine Arts; Doctor of Philosophy in English
- Master of Science, Doctor of Philosophy in Forensic Science
- Master of Arts, Doctor of Philosophy in Geography
- Master of Science, Doctor of Philosophy in Geology
- Master of Science in GIS and Spatial Analysis (online)
- Master of Arts in History, Public History; Doctor of Philosophy in History
- Master of Science, Doctor of Philosophy in Physics
- Master of Arts, Doctor of Philosophy in Political Science
- Master of Science in Psychology, Master of Science in Behavior Analysis; Doctor of Philosophy in Psychology: Behavior Analysis, Doctor of Philosophy: Behavioral Neuroscience, Doctor of Philosophy: Clinical Psychology, Doctor of Philosophy: Developmental Psychology.
- Master of Social Work (in person and online), Doctor of Philosophy in Social Work
- Master of Arts, Doctor of Philosophy in Sociology

The Eberly College of Arts and Sciences offers research or teaching concentrations as follows:

- Biology—ecology and evolutionary biology, forensic biology, genetics and genome biology, and neurobiology and endocrinology
- Chemistry—analytical, biological, inorganic, organic, and physical
- Communication studies—instructional, interpersonal, and organizational
- English—literature
- Geography—human geography, environmental geography, geographic information science
- Geology—energy geology, geophysics, hydrogeology, environmental geology
- History—United States (Appalachia), Europe, Africa, science, and technology
- Physics—condensed matter, applied physics, plasma physics, astrophysics, electro-optics, elementary particle physics, and radio astronomy
- Political science—public policy analysis (domestic and international)
- Psychology—behavior analysis, behavioral neuroscience, clinical psychology, clinical child psychology, and developmental psychology
- Social Work—behavioral health, aging, child welfare, generalist practice and advanced integrated practice
- Sociology—crime, community, and culture

EBERLY COLLEGE GRADUATE NON-DEGREE SEEKING STUDENTS:

Applicants who wish to pursue graduate level work in the Eberly College unrelated to pursuing a degree may apply to be a graduate non-degree student (<http://catalog.wvu.edu/graduate/graduateeducationatwestvirginiauniversity/#applytext>). In addition to meeting the university requirements (http://catalog.wvu.edu/graduate/graduateeducationatwestvirginiauniversity/#Non-Degree_Graduate_Students) for a graduate non-degree student, applicants should submit brief a statement indicating why they would like to enroll in graduate coursework in the Eberly College. Applicants should also demonstrate that they have approval to enroll in specific courses.

ADMINISTRATION

DEAN

- R. Gregory Dunaway - Ph.D. (University of Cincinnati)

ASSOCIATE DEANS

- Lupe Davidson - Ph.D. (Duquesne University)
Associate Dean for Social Justice, Faculty Development and Innovation
- Valérie Lastinger - Ph.D. (University of Georgia)
Associate Dean for Academic Affairs
- Asuntina S. Levelle - J.D. (West Virginia University)
Associate Dean for Financial Planning and Management
- Duncan Lorimer - Ph.D. (University of Manchester)
Associate Dean for Research

ASSISTANT DEANS

- Andrea Bebell - Ph.D. (West Virginia University)
Assistant Dean of Undergraduate Student Services & Programs
- Jessica M. Deshler - Ph.D. (University of New Mexico)
Interim Assistant Dean for Graduate Studies
- John Navaratnam - Ph.D. Biology (West Virginia University)
Assistant Dean for Curriculum and Assessment

Policies

- Participation in Commencement (p. 2)
- Composition of Master's Thesis and Doctoral Committees (p. 2)

COMMENCEMENT

Participation in commencement ceremonies is a public recognition of students' academic efforts and accomplishments but does not necessarily imply that all degree requirements have been met. Commencement is a separate process from graduation.

As stated in the graduate catalog, (http://catalog.wvu.edu/graduate/advisingcoursesdegrees/degree_regulations/#graduationtext) "the dean ... determines which students may participate in their college/school's commencement ceremonies." In the Eberly College, participation in commencement involves two considerations.

- Students must have successfully defended their thesis or dissertation prior to the last day to register for commencement (<https://eberly.wvu.edu/students/eberly-college-commencement-may/>). No exceptions can be made to this policy.
- Students in Master's programs that require coursework only may request permission to participate early in the May commencement ceremony held prior to their graduation semester if there is strong evidence they will successfully complete all remaining requirements (no more than 6 credits) at the end of the summer term. If the program approves, **the graduate coordinator** must contact the Eberly College Associate Dean for Research and Graduate Studies with a request on behalf of the student. These requests should be submitted no later than the final day of classes in the semester corresponding to the commencement ceremony.

GRADUATE COMMITTEE COMPOSITION

In addition to the University policy (http://catalog.wvu.edu/graduate/advisingcoursesdegrees/degree_regulations/#committeetext) on the composition of thesis and dissertation committees, the Eberly College requires that the Chair of a graduate committee in the Eberly College of Arts and Sciences be a regular member of the graduate faculty (<https://graduateeducation.wvu.edu/faculty-and-staff/graduate-faculty/>) with a primary appointment in the department of the respective graduate student. Additionally, ECAS faculty members must constitute the majority of the committee.

Accreditation

The Master of Science in Forensic & Investigative Science within the Eberly College of Arts and Sciences has specialized accreditation through the Forensic Science Education Programs Accreditation Commission of the American Academy of Forensic Science.

The Doctor of Philosophy in Clinical/Clinical Child Psychology within the Eberly College of Arts and Sciences has specialized accreditation from the American Psychological Association. The Doctor of Philosophy in Behavior Analysis Psychology within the Eberly College of Arts and Sciences has specialized accreditation from the Association for Behavior Analysis International.

The Master of Public Administration within the Eberly College of Arts and Sciences has specialized accreditation through the Commission on Peer Review & Accreditation, Network of Schools of Public Policy, Affairs, and Administration (NASPAA).

The Master of Social Work within the Eberly College of Arts and Sciences is accredited by the Council on Social Work Education.

Certificate Programs

- Applied Statistics (<http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/statistics/>)
- Cultural Resource Management (<http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/culturalresourcemanagement/>)
- Women's and Gender Studies (<http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/womensstudies/>)

Courses

- Anthropology (ANTH) (p. 3)
- Astronomy (ASTR) (p. 3)
- Biology (BIOL) (p. 5)
- Chemistry (CHEM) (p. 7)
- Communication Studies (COMM) (p. 9)
- Data Science (DSCI) (p. 12)
- English (ENGL) (p. 12)
- Forensic and Investigative Science (FIS) (p. 16)
- Geography(GEOG) (p. 18)
- Geology (GEOL) (p. 20)
- German (GER) (p. 23)
- Gerontology (GERO) (p. 24)
- History (HIST) (p. 24)
- Humanities (HUM) (p. 27)
- Language Teaching Methods (LANG) (p. 27)
- Legal Studies (LEGS) (p. 29)
- Linguistics (LING) (p. 30)
- Mathematics (MATH) (p. 32)
- Philosophy (PHIL) (p. 35)
- Physics (PHYS) (p. 36)
- Political Science (POLS) (p. 38)
- Psychology (PSYC) (p. 40)
- Public Administration (PUBA) (p. 44)
- Religious Studies (RELG) (p. 46)
- Social Work (SOWK) (p. 47)
- Sociology (SOC) (p. 50)
- Spanish (SPAN) (p. 52)
- Statistics (STAT) (p. 54)
- Women and Gender Studies (WGST) (p. 56)

ANTHROPOLOGY (ANTH)

ANTH 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTRONOMY (ASTR)

ASTR 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ASTR 595. Independent Study. 1-9 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ASTR 601. Graduate Astrophysics Seminar. 1 Hour.

This two-semester class is designed for first-year physics graduate students interested in studying astrophysics. The course provides students access to introductory material they will need for the rest of their graduate astrophysics courses and research, including order-of-magnitude estimates, coordinate systems, blackbody radiation, radiative transfer, stellar structure and evolution, statistics, compact objects, relativity, and cosmology.

ASTR 667. Stellar Structure and Evolution. 3 Hours.

Comprehensive discussion of birth, life cycle and end products of stars. Topics covered include main-sequence evolution, giant stars, white dwarfs, supernovae neutron stars and black holes.

ASTR 670. General Relativity. 3 Hours.

Innovative 'physics- first' introduction to Einstein's relativistic theory of gravity. Topics covered include special relativity, curved space time, gravitational collapse and black holes.

ASTR 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

ASTR 695. Independent Study. 1-9 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ASTR 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ASTR 697. Research. 1-9 Hours.

ASTR 697. Research. I, II, S. 1-15 hr. PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading is S/U.).

ASTR 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision is needed during the writing of student reports (698), theses (698), or dissertations (798). (Grading is Normal.).

ASTR 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is normal; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

ASTR 700. Radio Astronomy. 3 Hours.

Introduction to radio astronomy theory and techniques suitable for graduate students. Topics covered include radio-wave fundamentals, antenna theory, radiation mechanisms, extragalactic sources, pulsars and cosmology.

ASTR 701. Computational Astrophysics. 3 Hours.

Introduction to C programming to solve astrophysical problems. Topics covered include hypothesis testing, Monte Carlo simulations and Fourier techniques for analysis of astronomical data.

ASTR 703. Galactic Astronomy. 3 Hours.

Detailed study of galactic structures. Topics covered include galactic dynamics, rotation and spiral density waves, the interstellar medium and supernova remnants.

ASTR 704. General Relativity. 3 Hours.

Innovative 'physics- first' introduction to Einstein's relativistic theory of gravity. Topics covered include special relativity, curved space time, gravitational collapse and black holes.

ASTR 705. The Interstellar Medium. 3 Hours.

PR: ASTR 694. In-depth look at the interstellar medium (ISM), the material in between stars, with a focus on our own Milky Way Galaxy. Topics covered include the composition of our Galaxy, the phases of the ISM, the properties of the gas and dust in the ISM, dust and gas chemistry, magnetic fields, and dynamic processes.

ASTR 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

ASTR 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ASTR 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ASTR 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ASTR 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

ASTR 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis (697), problem report (697), research paper or equivalent scholarly project (697), or a dissertation (797). (Grading May be S/U).

BIOLOGY (BIOL)**BIOL 536. Comparative Animal Physiology. 3 Hours.**

Exploration of physiological systems and underlying molecular mechanisms animals use to survive and cope with diverse environments. Analysis of major physiological processes, using a comparative approach, to understand how major organ systems work, maintain homeostatic balance, and provide adaptative advantages.

BIOL 548. Introduction to Cellular and Molecular Neuroscience. 3 Hours.

PR: Consent. An advanced course that synthesizes topics such as gene regulation, cell signaling and neural network structure into a comprehensive picture of the cellular basis of nervous system function.

BIOL 550. Phylogenetics and Comparative Biology. 3 Hours.

PR: This course requires the equivalent of one semester of coursework in evolutionary biology (BIOL 320, GEOL 331, BIOL 461, BIOL 464, BIOL 420, or BIOL 455), ecology (BIOL 321, BIOL 448, BIOL 456, BIOL 457, BIOL 462, BIOL 463), and/or statistical analysis (BIOL 430). This course is an in-depth exploration of the philosophy, theory, methods, and applications of phylogenetic analysis, which is the basis for all comparative biology. Topics covered include character homology assessment, phylogenetic reconstruction, divergence time estimation, trait evolution, and recent advances in phylogenomics.

BIOL 576. Computational Neuroscience. 4 Hours.

PR: Consent. This course focuses on the tools and concepts used to probe and characterize the dynamics of neurons, neural networks and neural coding mechanisms. Lectures introducing concepts and discussion sessions of the current research literature complement computer laboratories where the student learns programing skills, analytical tools and neural modeling methods used in computational neuroscience research.

BIOL 577. Central Nervous System Evolution and Development. 3 Hours.

PR: BIOL 219 and BIOL 348 or equivalent. Origin and evolution of the animal nervous system, focusing on developmental and genetic mechanisms underlying structural modifications that serve as the basis for the evolution of behavioral repertoires.

BIOL 579. Principles of Systems Neuroscience. 3 Hours.

PR: BIOL 348 or Consent. Fundamental principles of nervous system organization with an emphasis on interactions between neurons and the consequences for behavior. There will be a focus on recent advances in our understanding of each organizational principle.

BIOL 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOL 593. Special Topics. 6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 611. Epigenetics. 3 Hours.

Explores the molecular mechanisms, phenotypic phenomena and current application of epigenetics and the study of how genetic information is regulated and maintained. Students may not earn credit for both BIOL 415 and BIOL 611.

BIOL 615. Microbial Symbiosis. 3 Hours.

Molecular techniques used towards identifying the composition, structure and functions of microbial communities in various ecological contexts will be discussed. An understanding of the significance of microbial symbioses towards ecological and health processes will be developed. (Also listed as BIOL 456.).

BIOL 620. Genomics. 3 Hours.

PR: BIOL 219 or consent. Advanced elective examining biology and evolution on a genome-wide scale. Topics include fields of study and methods of DNA sequence acquisition and annotation, including exploration of the human genome and its contribution to disease discovery.

BIOL 651. Evolution of Infectious Diseases. 3 Hours.

The application of phylogenetics, microbiology, immunology, and epidemiology towards comprehending the evolution of infectious diseases. Students will develop a fundamental understanding of the significance of evolution and ecology towards infectious disease emergence and control.

BIOL 658. Systems Biology. 3 Hours.

PR: Consent. Systems Biology is an approach to understanding the dynamics of biological processes by integrating and assessing changes in and across networks. Technologies driving this approach include genome-wide sequencing of DNA and RNA, measurements of genome-protein interactions, and measurement of proteome levels and post-translational protein modifications.

BIOL 674. Neurogenetics and Behavior. 3 Hours.

PR: Consent. Overview of how researchers study complex human neurological disorders at the cellular, molecular, and behavioral levels using animal models and cutting edge basic research methods.

BIOL 681. Research Project Development. 1 Hour.

This course provides graduate students with guidance on the creation and presentation of their Program of Study, which is the first benchmark to be met for a graduate degree in Biology at WVU. The program of study details the background and broad goals of a thesis research project and is used to determine personalized course load.

BIOL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of biology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

BIOL 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOL 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIOL 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIOL 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

BIOL 715. Extracellular Matrix in Cell Signaling. 3 Hours.

The course emphasizes the fundamental role that that extracellular matrix plays in the process of morphogenesis, differentiation, development and maintenance of the differentiated state.

BIOL 737. Developmental Biology. 3 Hours.

PR: BIOL 336 or equiv., organic chemistry or biochemistry, or consent. The molecular and cellular basis of differentiation and morphogenesis. (Offered in fall of odd years.).

BIOL 752. Physiological Plant Ecology. 3 Hours.

PR: BIOL 350 and consent. Advanced studies on the interactions between plants and their environment focusing on whole-plant carbon exchange, water relations, and nutrient uptake, with reference to specific biomes.

BIOL 753. Water and Nutrient Relations of Plants. 3 Hours.

PR: BIOL 350 and consent. Advanced studies on water and nutrient acquisition, use, and transformation in plants with focus on plant-soil interactions, symbiotic associations, and acclimation and adaption mechanisms operating in plants.

BIOL 761. Ecosystem Dynamics. 3 Hours.

PR: Consent. A survey of our current understanding of the biogeochemistry that occurs at and near the surface of the Earth. Emphasis is placed on the biogeochemical cycles of carbon, nitrogen, phosphorus, and sulfur. The origin and dynamics of the atmosphere, lithosphere and hydrosphere are also considered. (Offered in even-numbered years).

BIOL 762. Plant Population Biology. 3 Hours.

PR: Graduate status or undergraduate status with the completion of BIOL 221 and the instructor's permit. Plant population biology exams the interplay of ecological theory and the real world of experimental ecology of natural populations using a case study approach. Each student will research a current topic in greater depth.

BIOL 788. Biology Department Colloquium. 1 Hour.

Provides for interactions with established scientists at other institutions through weekly presentations by researchers invited by graduate students and their faculty advisors.

BIOL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of biology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

BIOL 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

BIOL 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

BIOL 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

BIOL 794. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

BIOL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

BIOL 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

BIOL 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

BIOL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass or fail grading scale and do not apply as graduate credit toward a degree program.

CHEMISTRY (CHEM)**CHEM 511. Advanced Instrumental Analysis. 3 Hours.**

PR: CHEM 310 with a minimum grade of C-. Lectures and demonstrations. Classical and cutting-edge instrumental methods applied to chemical analyses: electrochemistry, spectroscopy, mass spectrometry, and chromatography; presented at the advanced level. (3 hr. lec.).

CHEM 512. Environmental Chemistry. 3 Hours.

PR: CHEM 215 and CHEM 234 and CHEM 348. Study of the nature, reactions, transport and fate of chemical species in the environment.

CHEM 514. Mass Spectrometry Principles and Practices. 3 Hours.

PR: CHEM 310. Fundamental principles underlying modern mass spectrometry. Gas phase chemistry related to the formation and fragmentation of ions. The design of instrumental systems for mass spectrometry. Application of mass spectrometric techniques to multidisciplinary problems of current interest. (3 hr. lec.).

CHEM 516. Bioanalytical Chemistry. 3 Hours.

PR: (CHEM 310 and AGBI 410) or equivalent. Analytical principles and instrumental methods as they are applied to biochemical questions. Students are taught to evaluate and formulate methods and approaches for biochemical analyses.

CHEM 517. Bioanalytical Imaging: Fundamentals and Techniques. 3 Hours.

Fundamental principles and state of the art applications of bioanalytical imaging techniques.

CHEM 519. Principles and Bioanalytical Applications of Microfluidics. 3 Hours.

Fundamental principles and state of the art applications of microfluidic techniques.

CHEM 521. Organometallic Chemistry. 3 Hours.

PR: Graduate standing in chemistry or consent. Syntheses, structure, and reactivity of organometallic compounds. Applications of organometallic compounds to catalysis and organic synthesis. (3 hr. lec.).

CHEM 522. Topics in Inorganic Chemistry. 3 Hours.

Structure and bonding of inorganic molecules and materials. Covers the chemistry of main group elements and transition metals. Application of fundamental principles in inorganic chemistry to current research problems.

CHEM 531. Advanced Organic Chemistry 1. 3 Hours.

PR: CHEM 234. Structural concepts, bonding, tautomerism, static and dynamic stereochemistry, mechanistic classifications of reagents, and reactions including some applications. (3 hr. lec.).

CHEM 532. Advanced Organic Chemistry 2. 3 Hours.

PR: CHEM 531. Continuation of CHEM 531 with emphasis upon synthetic methods and reaction mechanisms. (3 hr. lec.).

CHEM 533. Advanced Structure Determination Using Spectroscopic Methods. 3 Hours.

PR: Graduate standing or consent. In depth exposure to the techniques for identifying the functionalities and elucidating the bond connectivity of unknown organic molecules using UV, IR, and NMR spectroscopy and mass spectrometry techniques.

CHEM 541. Chemical Thermodynamics. 3 Hours.

PR: CHEM 348. Principles of classical and statistical thermodynamics and their application to chemical problems. (3 hr. lec.).

CHEM 542. Computational Chemistry. 3 Hours.

PR: CHEM 348 or consent. Introduction to the use of quantum mechanical-based computational techniques to study molecular structure, bonding, and reactivity, and their relationship to experimental techniques.

CHEM 545. Foundations of Quantum Chemistry. 3 Hours.

Application of the principles of quantum mechanics to chemical systems and spectroscopy.

CHEM 547. Chemical Crystallography. 3 Hours.

PR or Conc: (CHEM 346 and CHEM 348) or CHEM 341 or consent. Applications of X-ray diffraction of crystals to the study of crystal and molecular structure. Includes diffraction theory, space group symmetry, and crystallographic methods of analysis. (3 hr. lec.).

CHEM 548. Biophysical Chemistry. 3 Hours.

Biophysical Chemistry lies at the interface between physics, chemistry and biology, applying theories and methods of the physical sciences toward understanding biological systems. This course focuses on the physical chemistry of biological macromolecules. Topics to be covered include protein structure formation and stability, forces/interactions in biological molecular systems, bio-macromolecule folding dynamics, phase transitions in proteins, and membrane physics.

CHEM 549. Proximal Probe Techniques. 3 Hours.

Proximal probe techniques rely on the use of nanoscale probes, positioned and scanned in the immediate vicinity of surfaces. Their development is often viewed as a first step towards nanotechnology, since they demonstrate the feasibility of building purposeful structures one atom or one (macro) molecule at a time. This course provides thorough physical background of scanning probe microscopy techniques.

CHEM 552. Biochemical Toxicology. 3 Hours.

Introduction to the principles of toxicology, with a focus on the processes that occur at the cellular and molecular levels when chemicals interact with living organisms.

CHEM 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHEM 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHEM 651. Pedagogy for College Chemistry. 3 Hours.

Prepare and equip future faculty for instructing within the chemistry discipline.

CHEM 695. Independent Study. 1-6 Hours.

Faculty supervised study of topics not available through regular course offerings.

CHEM 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

CHEM 713. Electrochemistry and Instrumentation. 3 Hours.

PR: CHEM 310. Electronic instrumentation applied to study of mass transfer kinetics of electrode reactions, voltammetry, and high-frequency methods. (3 hr. lec.).

CHEM 715. Chemical Separations. 3 Hours.

PR: CHEM 215 and CHEM 233, and physical chemistry. Fundamentals of transport and flow processes underlying all separation techniques. Empirical coverage of chromatographic and electrophoretic methods for analytical separations. (3 hr. lec.).

CHEM 723. Physical Methods in Inorganic Chemistry. 3 Hours.

PR: CHEM 422. Symmetry, vibrational spectroscopy, theory and applications of NMR and EPR methods, magnetism, optical activity, dynamic processes and fluxional behavior. (3 hr. lec.).

CHEM 727. Bioinorganic Chemistry. 3 Hours.

PR: CHEM 422 or consent. Metal ions in biological systems; proteins, nucleic acids, and cofactors as ligands; metal uptake, storage, and regulation; structural and catalytic roles; substance activation, electron transfer, and group transfer reactions; metals in medicine.

CHEM 743. Chemical Kinetics. 3 Hours.

PR: CHEM 348. Theories and applications of kinetics in gaseous state and in solution. (3 hr. lec.).

CHEM 745. Theoretical Chemistry 1. 3 Hours.

PR: Differential equations. Theoretical background for quantum mechanics. (3 hr. lec.).

CHEM 746. Theoretical Chemistry 2. 3 Hours.

PR: CHEM 745. Theories and applications of quantum mechanics in chemistry. (3 hr. lec.).

CHEM 747. Molecular Spectroscopy and Structure. 3 Hours.

PR: CHEM 450 or graduate standing in chemistry, or consent. Advanced applications of spectral methods to the study of molecular structure. (3 hr. lec.).

CHEM 750. Introduction to Proteomics. 3 Hours.

Introduction to protein separations and sequencing by modern mass spectrometry, and the application of these methods to the study of biological systems in health and environmental sciences.

CHEM 789. Research Seminar. 1 Hour.

PR: Graduate student in chemistry. Research seminars by visiting lecturers.

CHEM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of chemistry. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

CHEM 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

CHEM 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

CHEM 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

CHEM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

CHEM 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

CHEM 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, program report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

COMMUNICATION STUDIES (COMM)**COMM 509. Health Comm Dissemination. 3 Hours.**

PR: COMM 409. Focus on effective dissemination of health messages. Students communicate outcomes of health communication campaigns conducted in previous classes to diverse external publics; could include presentations to conferences, community groups, schools, workshops.

COMM 511. Research Methods for Non-Profit Organizations. 3 Hours.

Advanced research skills applicable to non-profit organizations including precise, effective use of discipline-specific databases and grant-seeking research.

COMM 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

COMM 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 601. Instructional Communication. 3 Hours.

Survey of the theory and research in instructional communication. Emphasis is placed on the study of instructional communication behaviors and the role instructor-student communication plays in the instructional setting.

COMM 602. Interpersonal Communication: Theory and Research. 3 Hours.

Survey of the theory and research in interpersonal communication. Emphasis upon relational communication and intimate communication in interpersonal relationships.

COMM 603. Communication Training and Development. 3 Hours.

This applied graduate course provides the student, who has a background in human communication theory and research, an introduction to communication training and development issues, procedures, assessment, and presentational skills.

COMM 604. Theory and Research in Persuasion. 3 Hours.

Various theories and principles of persuasion with emphasis on contemporary research literature.

COMM 605. Theory and Research in Mass Communication. 3 Hours.

Mass communication from a consumer's viewpoint. Use of consumer-oriented mass media research also stressed.

COMM 606. Theory and Research in Organizational Communication. 3 Hours.

Contemporary research linking communication variables and networks to organizational change, effectiveness, leadership, power, and management practices. Analysis of communication problems within a variety of organizations.

COMM 608. Nonverbal Communication. 3 Hours.

Examines the impact of nonverbal communication on the communication process. Attention is given to research on non-language aspects of communication and their application to various contexts.

COMM 610. Family Communication. 3 Hours.

This course addresses the communication that exists within and about families. We address various family structures, and employ various theoretical frameworks to explain, predict, and control family communication and its correlates with socio-cultural, relational and individual wellbeing.

COMM 611. Intergroup Communication. 3 Hours.

This course focuses on intergroup communication and the reciprocal nature between identity and pro/anti-social interaction. Moving beyond the popular individualized communication perspective, intergroup theories and research allow us to explore the prominence of social group memberships (e.g., age, race, religion, gender, value orientations) in our everyday communication and cognitions.

COMM 612. Small Group Theory and Practice. 3 Hours.

Specific research areas in interpersonal communication with emphasis on small groups.

COMM 622. Gender and Communication. 3 Hours.

This graduate course will review contemporary and historical communication issues about sex, gender, and communication. Nonverbal communication, friendship, romantic family, educational, organizational, and media impacts will be reviewed.

COMM 623. Leadership. 3 Hours.

Leadership styles, models and theories in classical and contemporary settings are covered. Emphasis is given to leadership in groups and organizations.

COMM 624. Communication Ethics. 3 Hours.

This course focuses on communication ethics with a particular emphasis on communication ethics in the organizational context. Communication issues and situations are explored from various ethical perspectives.

COMM 625. Computer Mediated Communication. 3 Hours.

This course explored the relationships between CMC and various aspects of human activity. This course investigates established and emerging CMC-based social, cultural, organizational, and instructional activities.

COMM 626. Intercultural Communication: Theory and Research. 3 Hours.

Advanced seminar in communication of various cultures. Special emphasis on research in diffusion of innovations.

COMM 629. Health Communication. 3 Hours.

Overview of essential concepts and theories needed to understand and evaluate health-related messages in patient-provider relationships, between workers in health care organizations, and in medial related applications.

COMM 632. Humor and Communication. 3 Hours.

Advanced study of humor research as a communication process, from both source and receiver perspectives. The class investigates humor theories, research on functions, enactment, and applications of humorous communication across various work and social contexts.

COMM 635. Social & Digital Media Management. 3 Hours.

This course will present students with theoretical and applied examples of how social and digital media can be successfully managed, as well as provide examples of the consequences of unsuccessful management. In the end, students will craft a social and digital media management plan for their organization or industry of choice, based on the theories and concepts discussed.

COMM 636. Workplace Relationships. 3 Hours.

Provides an overview of workplace relationships, including superior-subordinate, mentor-protégé, peer, friendships, romantic, work-spouse, client/customer, and volunteer relationships. Focuses on the functions, developmental processes, and outcomes associated with each relationship.

COMM 645. Masspersonal Communication. 3 Hours.

Examines intersections of interpersonal and mass communication research. The role of interpersonal communication in campaigns, computer-mediated communication, avatar effects, and celebrity and character attachments is explored, as well as the effect of media use on interpersonal communication.

COMM 650. Applied Communication Theory. 3 Hours.

Introduction to major communication theories, with emphasis on the applicability of these theories in the organizational context.

COMM 651. Organizational Research and Evaluation. 3 Hours.

Practical application of understanding and interpreting quantitative research and data collected by corporations and other organization. Students will acquire skills to be more critical and knowledgeable consumers of data and research. Students will develop data-analytic skills and propose research-based solutions to make better organizational decisions.

COMM 652. Diversity in the Workplace. 3 Hours.

Examines diversity/difference at work applying an intergroup communication approach intersecting diversity, identity, prejudice, inclusion and exclusion. Explores the prominence of differences of social, moral, religious, racial, and familial group memberships in our everyday lives.

COMM 654. Social Marketing for Behavior Change. 3 Hours.

Social marketing is the practice of applying marketing principles and techniques to promote social objectives that benefit individuals or society, such as improving public health and safety, and protecting the environment. This course will introduce students the basic principles of social marketing and teach them the steps in developing a social marketing communication campaign.

COMM 655. Computer-Mediated Communication and Professional Identity. 3 Hours.

Examines digital media footprints and strategies for effectively communicating professional identities online. Students evaluate current online identity portrayals and develop a theory-based strategy for goal-directed self-presentations.

COMM 656. Organizational Culture. 3 Hours.

This course examines how human communication that occurs within an organization influences how the organization creates, sustains, and changes its workplace culture. Emphasis is placed on how organizational culture is created through artifacts, espoused and enacted values, and underlying assumptions/beliefs.

COMM 659. Case Studies in Communication. 3 Hours.

This course focuses on case studies involving organizational ethics. Communication issues and situations are evaluated from various ethical perspectives. Students create their own case study.

COMM 660. Communication in the Organization. 3 Hours.

This course exposes students to the role of communication in organizational environment with particular emphasis on its social science roots.

COMM 662. Conflict in Professional Life. 3 Hours.

This course is designed to examine research findings and theory about managing and resolving conflict in professional life. This course will examine both the macrodynamics (i.e., general/global conflict processes that occur in any social setting) and microdynamics (i.e., conflict that occurs uniquely in the workplace) of conflict research.

COMM 672. Family Difference. 3 Hours.

Addresses within-family differences spanning communicative, social identity, and other categories of differentiation. Explores family socialization of difference, examining the (un)just, inclusive and exclusive communication practices taught within families.

COMM 675. Entertainment-Education. 3 Hours.

Survey of current research on entertainment-education theory and applications, a communication strategy that utilizes entertainment media, usually fictional drama, suspense and humor, in order to educate audiences and improve their health, safety, human rights, or other critical social issues.

COMM 685. Media & Emotion. 3 Hours.

Introduction to fundamental theories of emotion and survey of current theory and research on how emotions affect people's media selections and influence their experience with media content.

COMM 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COMM 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

COMM 693. Grantseeking. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

COMM 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

COMM 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

COMM 700. Survey of Human Communication Theory. 3 Hours.

Broad overview of contemporary theories in human communication. Should be taken the first semester of graduate study.

COMM 701. Graduate Research Methods. 3 Hours.

Major emphasis on designing and conducting experimental and laboratory research in human communication. Computer applications to social science research also given consideration. Should be taken the first semester of graduate study.

COMM 702. Advanced Interpersonal Communication. 3 Hours.

PR: COMM 602. This course examines how interpersonal communication patterns are linked to relational processes, both as influences and outcomes. Emphasis is on in-depth analysis of social science interpersonal research.

COMM 706. Advanced Organizational Communication. 3 Hours.

PR: COMM 606. This course provides an overview of the history and development of organizational communication. Additionally, current organizational theories and perspectives are investigated.

COMM 711. Advanced Seminar in Research Methods. 3 Hours.

PR: COMM 701. Research techniques necessary to conduct original communication research. Emphasis on advanced statistical techniques.

COMM 712. Communication Measurement. 3 Hours.

PR: COMM 701. This course investigates measures and instruments used in the field of communication studies. Focus is placed on the creation and validation of communication measures.

COMM 713. Qualitative Research Methods. 3 Hours.

Qualitative research methods in human communication and related professional areas with major emphasis on conducting and evaluation qualitative research procedures. Special focus on practical application.

COMM 719. Advanced Instructional Communication. 3 Hours.

Examination of issues surrounding instructional communication. Topics include study of history, paradigms, and programmatic areas of research of instructional communication.

COMM 722. Dark Side of Interpersonal Communication. 3 Hours.

Addresses transgressions and other violations of relational rules and their antecedents and consequences in the context of close personal relationships.

COMM 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of communication studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students on assistantships to gain teaching experience. (Grading will be P/F.).

COMM 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

COMM 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

COMM 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

COMM 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

COMM 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

COMM 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

DATA SCIENCE (DSCI)

DSCI 501. Data Analysis. 3 Hours.

Basic statistical principles, probability rules, R programming, probability distributions, estimation and testing related to binomial and Poisson distributions, goodness-of-fit test, contingency-table models, the normal distribution, sampling distributions, simulations, one- and two-sample inferences, bootstrap inferences, nonparametric tests, simple linear regression, one-way analysis of variance, model assessment, and multiple testing. R is used for modeling and plotting data based examples and exercises.

DSCI 502. Data Modeling. 3 Hours.

PR: DSCI 501 or Consent. Matrix algebra using R, analysis of covariance, least squares means, model assessment, multi-way analysis of variance, fixed, random, and mixed effects models, expected mean squares, variance components, unbalanced models, multiple comparisons, nested and block designs, multilevel models, multiple regression, transformations, polynomial and nonlinear regression, logistic regression, and Poisson regression. R is used in data based examples and exercises.

DSCI 503. Data Science Processes. 3 Hours.

PR: DSCI 500. Basic data science algorithms. Data science processes, including workflows to build data products based on data collection and processing, machine learning algorithms, and statistical models using R and Python. Reproducible project reports, including data visualizations.

DSCI 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics that are not covered in regularly scheduled courses.

DSCI 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

DSCI 695. Independent Study. 1-9 Hours.

Faculty-supervised study of topics not available through regular course offerings.

ENGLISH (ENGL)

ENGL 509. Approaches to Teaching Composition. 3 Hours.

Prepares graduate students in the English Secondary Education MAC program for initial certification by surveying theories and foundational principles that inform contemporary writing instruction, and by providing opportunities to practice and experiment with writing pedagogies and to develop classroom leadership.

ENGL 550. Introduction to Forensic Linguistics. 3 Hours.

This course introduces students to the analysis of language for legal purposes and provides them first-hand experience in forensic linguistics. The course focuses on the application of linguistic theory, research, and procedures to issues of the law. In their final project, students analyze language data and provide a forensic linguistic report. Also listed as ENGL 450.

ENGL 593. Special Topics. 1-6 Hours.**ENGL 595. Independent Study. 1-9 Hours.**

Faculty supervised study of topics not available through regular course offerings.

ENGL 601. Studies in Composition and Rhetoric. 3 Hours.

Historical developments in the field of composition and rhetoric as it relates to current issues and practices.

ENGL 602. Editing. 3 Hours.

Introduces students to the theory and practice of editing.

ENGL 605. Professional Writing Theory. 3 Hours.

Introduces students to the history of, development of, and current issues in professional writing theory and research.

ENGL 606. Introduction to the Digital Humanities. 3 Hours.

Examines the evolution and application of digital research methods, focusing on topics that rotate by semester including literary and cultural studies, rhetoric and composition, and professional writing.

ENGL 607. Topics in Rhetoric. 3 Hours.

Topics vary by year; check with instructor. Course may include textual, historical, critical, and/or theoretical study. Not restricted to any one period or century.

ENGL 609. College Composition Pedagogy. 3 Hours.

Introduces students to theories, practices, and current issues in teaching college composition. Restricted to GTAs in the English department.

ENGL 610. Professional Writing Internship. 3,6 Hours.

PR: ENGL 601 and ENGL 602 and ENGL 605. Student applies research and theory to writing tasks in a professional setting; (100 workplace hours for 3 credits; 200 hours for 6 credits.).

ENGL 611. Sturm Workshop. 1 Hour.

PR: Consent. Creative writing workshop conducted by Sturm visiting writer in residence.

ENGL 618. Graduate Writing Workshop: Poetry. 3 Hours.

PR: Consent. Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 618A. Graduate Writing Workshop: Fiction. 3 Hours.

PR: Consent. Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 618B. Graduate Writing Workshop: Non-Fiction. 3 Hours.

PR: Consent. Advanced workshop in creative writing. Genre and focus vary from semester to semester.

ENGL 631. Studies in Nonfiction Prose. 3 Hours.

Advanced study in the genre of nonfiction, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 632. Studies in Poetry. 3 Hours.

Advanced study in the genre of poetry, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 634. Studies in Drama. 3 Hours.

Advanced study in the genre of drama, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 635. Studies in the Novel. 3 Hours.

Advanced study in the genre of the novel, with emphasis varying from year to year. Course may include textual, historical, critical, formalist, and/or theoretical study. Not restricted to any one period or century.

ENGL 636. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636A. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636B. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636C. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636D. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636E. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636F. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636G. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636H. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636I. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636J. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636K. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636L. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636M. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636N. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636O. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636P. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Q. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636R. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636S. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636T. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636U. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636V. Study of Selected Authors. 3 Hours.

Advanced study of one or more majors authors.

ENGL 636W. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636X. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Y. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 636Z. Study of Selected Authors. 3 Hours.

Advanced study of one or more major authors.

ENGL 646. American Literature to 1865. 3 Hours.

Readings in the literature of America from its beginnings to 1865; attention to major writers and genres; focus on literary history.

ENGL 647. American Literature, 1865-1915. 3 Hours.

Readings in the literature of America from 1865-1915; attention to major writers and genres; focus on literary history.

ENGL 648. American Literature, 1915-Present. 3 Hours.

Readings in the literature of America from 1915 to the present; attention to major writers and genres; focus on literary history.

ENGL 661. Medieval Literature. 3 Hours.

Readings in the literature of the medieval period; attention to major writers and genres; focus on literary theory.

ENGL 663. Shakespeare. 3 Hours.

Intensive study of selected plays. Special attention to textual problems and to language and poetic imagery, together with the history of Shakespearean criticism and scholarship.

ENGL 664. Renaissance Literature. 3 Hours.

Readings in the literature of the English renaissance; attention to major writers and genres; focus on literary history.

ENGL 666. Restoration and Eighteenth-Century Literature. 3 Hours.

Readings in the literature of England during the Restoration and the eighteenth century; attention to major writers and genres; focus on literary history.

ENGL 668. Romantic Literature. 3 Hours.

Readings in the literature of England during the Romantic period; attention to major writers and genres; focus on literary history.

ENGL 669. Victorian Literature. 3 Hours.

Readings in the literature of England during the Victorian period; attention to major writers and genres; focus on literary history.

ENGL 671. Twentieth-Century British Literature. 3 Hours.

Readings on the literature of England during the twentieth century; attention to major writers and genres; focus on literary history.

ENGL 680. Introduction to Literary Research. 1-6 Hours.

Bibliography; materials and tools of literary investigations; methods of research in various fields of literary history and interpretation; problem of editing. Practical guidance in the writing of theses.

ENGL 682. Recent Literary Criticism. 3 Hours.

Brief survey of theories of major schools of recent criticism and an application of these theories to selected literary works.

ENGL 688. Creative Writing Mentoring. 3 Hours.

Supervised practice in mentoring advanced undergraduate creative writers.

ENGL 689. Writing and Editing Practicum. 1-3 Hours.

Supervised practice in writing and editing. (Grading will be S/U.).

ENGL 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

ENGL 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

ENGL 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENGL 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENGL 697. Research. 1-9 Hours.

ENGL 697. Research. 1-9 hr. PR: Consent. Research activities leading to thesis, problem report, research paper, scholarly project, or a dissertation. Grading is S/U.

ENGL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ENGL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement in the semester in which graduation occurs.

ENGL 701. Seminar in Rhetoric. 3 Hours.

PR: ENGL 601, or ENGL 605, or ENGL 609. Topics vary. Focus will be on a problem or issue in rhetorical studies that reflect the instructor's current research (check with instructor).

ENGL 741. Seminar in American Studies. 3 Hours.

Seminar in principal authors and movements in American literature.

ENGL 764. Seminar in Renaissance Studies, 1550-1660. 3 Hours.

Studies in major authors and special topics in the Renaissance.

ENGL 766. Seminar in Restoration and Eighteenth-Century Studies. 3 Hours.

Studies in major authors and special topics in the period.

ENGL 768. Seminar in British Romanticism. 3 Hours.

Studies in major authors and special topics in the field of British Romanticism.

ENGL 771. Seminar in Twentieth-Century British Studies. 3 Hours.

Seminar in principal authors and movements in twentieth-century British literature.

ENGL 782. Current Directions in Literary Study. 3 Hours.

PR: Advanced graduate standing (prior completion of ENGL 682 is recommended). Intensive study of one or more current approaches to literature and theories of criticism, with some emphasis on the interrelations of literary study with other disciplines.

ENGL 789. Folger Seminar. 1-6 Hours.

PR: Graduate standing. (Enrollment is by special application only. Contact department chairperson for information.) Seminar conducted by distinguished scholars and held at the Folger Institute in Washington, D.C. Topics vary.

ENGL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of English. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

ENGL 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

ENGL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

ENGL 797. Research. 1-9 Hours.

ENGL 797. Research. 1-9 hr. PR: Consent. Research activities leading to thesis, problem report, research paper, scholarly project, or a dissertation. Grading is S/U.

ENGL 798. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

ENGL 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology.) The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

ENGL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

FORENSIC AND INVESTIGATIVE SCIENCE (FIS)

FIS 501. Foundations of Criminalistics. 3 Hours.

PR: Corequisite of FIS 501L. Core theories and fundamental principles of criminalistics. Particular attention dedicated to problems of interpreting physical evidence. Also addresses aspects of research, scientific method, and ethics.

FIS 501L. Foundations of Criminalistics Laboratory. 0 Hours.

PR: Corequisite of FIS 501. Foundations of Criminalistics - FIS 501 Laboratory.

FIS 502. Forensic Laboratory Management. 3 Hours.

PR: Corequisite of FIS 502L. Overview of management issues in forensic science laboratories, including personnel and human resources, project management, leadership, organization, communication, strategy and budgeting.

FIS 502L. Forensic Laboratory Management Laboratory. 0 Hours.

PR: Corequisite of FIS 502. Forensic Laboratory Management - FIS 502 Laboratory.

FIS 505. Biological and Chemical Evidence. 3 Hours.

PR: Acceptance to the Forensic Justice LL M. The course will enable legal professionals to have a basic understanding of Chemical and Biological evidence in legal proceedings. It is a cross link between science and law and will close the existing gap between the two disciplines. The course will enable legal professionals to prepare for examination or cross examination of expert witnesses in legal proceedings.

FIS 514. Forensic Impression & Trace Evidence. 3 Hours.

PR: Admission to the Master of Laws (LLM) in Forensic Justice and FIS 480 with a minimum grade of C-. Introduction to the analysis and interpretation of forensic impression and trace evidence. Critical analysis skills for data collection methods, data interpretation, reporting structures, current challenges, and anticipated advances. Topics include: fingerprints, firearms, footwear, microscopy, hair, glass, and bloodstain pattern analysis.

FIS 592. Directed Study. 1-6 Hours.

PR: Consent. Directed study, reading, and or research.

FIS 602. Forensic Informatics. 4 Hours.

PR: Corequisite of FIS 602L. Introduction to mathematical methods of forensic data analysis, including (1) digital imaging theory, (2) data pre-processing and exploitation methodologies (e.g., principle component analysis, frequency filtering, etc.) and (3) classical and post classical decision metrics. Theoretical concepts will be supplemented by practical laboratory exercises. Basic algorithm development will also be discussed.

FIS 602L. Forensic Informatics Laboratory. 0 Hours.

PR: Corequisite of FIS 602. This is a practical laboratory class designed to familiarize the student with real-world applications of data processing. Students will formulate individualized semester-projects that can be solved using automated and numerical computing approaches. Project tasks will be executed and validated throughout the semester, culminating in a functional solution to a real-world problem that will be described in video tutorial.

FIS 610. Firearms Examination. 3 Hours.

PR: Corequisite of FIS 610L. Fundamentals and advanced aspects of firearms related to evidence. Topics include the design, mechanism, and manufacture of firearms as well as interior, exterior and terminal ballistics. This course includes laboratory component.

FIS 610L. Advanced Firearms Examination Laboratory. 0 Hours.

PR: Corequisite of FIS 610. Firearms Examination - FIS 610 Laboratory.

FIS 614. Trace Evidence Examination. 3 Hours.

PR or CONC: FIS 614L, and a background in the fundamentals of chemistry and microscopy (inclusive of laboratories) equivalent to WVU's FIS 340/341 and FIS 314 are necessary for success in this course. Develops the skills to identify and examine trace evidence, and interpret its role in forensic investigations. Students will analyze the current state of forensic examinations of glass, paint, tape, hairs, fibers, inks and firearm discharge residues.

FIS 614L. Laboratory Trace Evidence Examinations. 1 Hour.

PR or CONC: FIS 614 and a background in the fundamentals of chemistry and microscopy (inclusive of laboratories) equivalent to WVU's FIS 340/341 and FIS 314 are necessary for success in this course. Hands-on laboratory designed to prepare students for the forensic examination of trace evidence. This course will guide students to develop analytical skills for the collection, recovery, preservation, analysis, and interpretation of trace materials commonly analyzed in crime laboratories (glass, paint, tapes and adhesives, gunshot residues, inks and paper, soil, fibers and hair).

FIS 615. Questioned Document Examination. 3 Hours.

This course will focus on handwriting comparisons, signatures, typewriting, and typescripts. Topics include erasures, additions and alterations, printed and photocopied documents and ink analysis. This course includes a laboratory component.

FIS 620. Forensic Casework Practicum. 3 Hours.

Students will manage mock cases involving multiple types of evidence. They will collect, analyze and interpret the evidence. Written reports on the case will be submitted to evaluation during a mock trial.

FIS 632. Advanced Forensic Biology. 3 Hours.

PR: Corequisite of FIS 632L. Overview of forensic biological history and current methods used by a DNA analyst working in a crime laboratory. Focus on interpretation and reporting of DNA data. The course will coincide with laboratory exercises to solidify concepts learned in class.

FIS 632L. Advanced Forensic Biology Laboratory. 0 Hours.

PR: Corequisite of FIS 632. This laboratory will provide practical experience with the fundamental methods utilized by the forensic DNA analyst from sample identification through report writing.

FIS 660. Advanced Forensic Chemistry. 3 Hours.

This course covers the chemical analysis of a wide variety of forensic evidence types. Topics include statistics, sampling, data quality, calibration, sample preparation, instrumentation; drug analysis, toxicology and explosives. This course includes a laboratory component.

FIS 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching.

FIS 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

FIS 695. Independent Study. 1-9 Hours.

Faculty Supervised study of topics not available through regular class offerings.

FIS 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FIS 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

FIS 703. Research Design in Forensic Science. 3 Hours.

PR: Admission to the FIS Doctor of Philosophy program. Research Design in Forensic Science is an applied research and statistics based course established specifically for students in the FIS Doctor of Philosophy program. The course will prepare students for data analysis related to sampling, regression, outlier detection, univariate significance testing, propagation of uncertainty, multivariate classification, classifier evaluation, Bayesian reasoning, data standardization and significance reporting.

FIS 792. Directed Study. 1-6 Hours.**FIS 796. Graduate Seminar. 1-3 Hours.**

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

FIS 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation.

GEOGRAPHY (GEOG)

GEOG 520. Methods for Open Science. 3 Hours.

New approaches in data science are enabling collaboration and discovery at unprecedented rates and scales. Students will learn how to rapidly download data; use the terminal to search, organize, and edit large numbers of files; develop a workflow, functions, and loops in open programming language (Unix-like and R); and use version control software (GitHub) to enable collaboration and reproducibility.

GEOG 550. Geographic Information Science. 4 Hours.

PR: Corequisite of GEOG 550L. Principles and practice of geographical information science. Geospatial data handling for research, planning and decision-making. Spatial analysis, information production, and display.

GEOG 550L. Geographic Information Science Laboratory. 0 Hours.

PR: Corequisite of GEOG 550. Geographic Information Science - GEOG 550 Laboratory.

GEOG 551. Open-Source GIScience. 3 Hours.

PR: GEOG 550 or students must complete an equivalent course or undergraduate GIS coursework and obtained instructor permission. The goal of this course is to introduce students to open-source software tools and standards for working with spatial data and undertaking spatial analysis. Topics explored include open data standards, open metadata standards, open licensing options, and undertaking geospatial data science in currently available open source environments including QGIS, GRASS, SAGA, Orfeo Toolbox, and WhiteboxTools.

GEOG 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOG 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 600. Geography Research Colloquium. 1 Hour.

PR: Consent. Lectures and presentation on recent and current research by resident and visiting scholars.

GEOG 601. Geographic Thought. 3 Hours.

This seminar explores formative theories and ideas in contemporary geographic thought. It covers some of the essential history of geographic thought, but the course is not a comprehensive survey of the "traditions" of the Geographic discipline. Rather, we examine the key epistemologies that have animated our discipline since mid 20th century.

GEOG 602. Geographic Research-Design. 3 Hours.

PR: GEOG 300 and GEOG 601. Choosing, preparing, and developing research problems of geographic interest. Emphasizes proposal writing and research design alternatives.

GEOG 603. Qualitative Research in Geography. 3 Hours.

PR: GEOG 601. Analysis of qualitative research in geography and related fields. Examine methodological approaches and techniques that explore and interpret issues in the development of geographical research projects.

GEOG 612. Gender, Society and Space. 3 Hours.

PR: GEOG 601 or Consent. Examines how gender and feminist perspectives are an integral part of how space is used, distributed, and perceived in society. Overviews of major developments in the field including diversity and difference, representation, identity, and nature.

GEOG 640. Geopolitical Perspectives. 3 Hours.

This course uses geopolitical perspectives to critically examine the linkages between power and places. Seminal literatures in the sub- field of geopolitics are read and critiqued, including critical geopolitics, feminist geopolitics and post-colonial theory.

GEOG 650. Political Ecology Seminar. 3 Hours.

Critical examination of the some of the most world's most pressing social-ecological challenges, including the impacts of and responses to climate change and issues of environmental justice, based on scholarship from the social and biophysical sciences. Students will explore foundational texts, core themes and debates, and future trajectories in political ecology.

GEOG 651. Geographic Information Science: Technical Issues. 3 Hours.

PR: GEOG 350. Current issues in GIS research. Technical aspects of GIS operations, algorithms, theory of geographical data structures, and error handlings. Labs focus on tools, data structures, database languages and macros. (2 hr. lec., 1 hr. lab.).

GEOG 654. Environmental Geographic Information Systems Modeling. 3 Hours.

Provides background and hands-on experience needed to answer scientific questions about the environment within a raster- based GIS Framework. Students should have introductory level GIS background.

GEOG 655. Remote Sensing Principles. 3 Hours.

PR: Corequisite of GEOG 655L. Mapping of earth features using aerial and satellite-borne sensors, image enhancement, geo-referencing, and classification. (Also listed as GEOL 655).

GEOG 655L. Remote Sensing Principles Laboratory. 0 Hours.

Coreq: GEOG 655. Remote Sensing Principles - GEOG 655 Laboratory.

GEOG 657. Open-Source Spatial Analytics. 3 Hours.

PR: GEOG 550. Prepare, analyze, and model geospatial data using the R language and computational environment. Topics covered include coding in R, data wrangling, data visualization and mapping, vector- and raster-based spatial analysis, spatial predictive modeling using machine learning, and presenting results.

GEOG 662. Digital Cartography. 3 Hours.

PR: GEOG 550. Use cartographic principles, geographic information systems (GIS), graphic design software, and digital data to generate reference and thematic maps appropriate for an intended audience. Learn to generate effective maps and visualizations by exploring cartographic standards, geospatial datums and projections, data visualization techniques, scale and generalization, typology and labeling, use of color, and parameterization of symbols.

GEOG 663. Client-Side Web GIS. 3 Hours.

PR: GEOG 550. Explore client-side web technologies and tools for serving data and developing web maps and applications. Define web content using hypertext markup language (HTML), style web content using cascading style sheets (CSS) and Bootstrap, and add functionality to a website using JavaScript, jQuery, and web mapping APIs.

GEOG 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOG 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOG 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOG 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his/her program.

GEOG 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEOG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEOG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

GEOG 701. Quantitative Spatial Analysis. 3 Hours.

This course covers methodological issues in the use of statistics for analysis of geographical data, such as sampling, inference, and the modifiable areal unit problem. It also covers a series of specific quantitative techniques tailored to student needs, such as spatial regression, measures of spatial autocorrelation, and geostatistical interpolation.

GEOG 753. Exploratory Spatial Data Analysis. 3 Hours.

Develop expertise in spatial analytical techniques for use in geographical data analysis and GIS.

GEOG 755. Advanced Remote Sensing. 3 Hours.

PR: (GEOG 655 or GEOL 655) and Coreq: GEOG 755L or consent. Collection, processing, and classification of remotely sensed data, including optical, thermal, radar, and topographic information. (Also listed as GEOL 755.).

GEOG 780. Non-Thesis Project. 3 Hours.

Research activities leading to a non-thesis project report.

GEOG 790. Teaching Practicum. 1-3 Hours.

GEOG 790. Teaching Practicum. 1-3 Hr Supervised practice in college teaching.

GEOG 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOG 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOG 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOG 794. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOG 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOG 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GEOG 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEOLOGY (GEOL)

GEOL 505. Scientific Writing. 3 Hours.

Fundamentals of effective science communication with emphasis on the skills and ethical practices required to produce high-quality, long-form writing projects. Course work involves all aspects of the writing process, including planning, drafting, editing and revising. Course also addresses how to identify and target different audiences using alternative science communication formats. Emphasis on geoscience but applicable to all natural sciences.

GEOL 506. Graphic Design for Scientists. 3 Hours.

A class focusing on figure design and ergonomics using computer software for professionals and scientists.

GEOL 509. Deep Time Earth Systems. 3 Hours.

Interrelationships of Earth Systems - the lithosphere, the hydrosphere, the atmosphere, and the biosphere - through space and time.

GEOL 510. Computer Aided Subsurface Interpretations. 3 Hours.

PR: GEOL 311 and GEOL 341. Develop subsurface interpretations from integrated geological, geophysical and engineering databases in a computer workstation environment. Construct maps and 3D visualizations of subsurface structure, seismic horizons, layer properties, etc., for prospect location and subsurface assessment.

GEOL 511A. Sedimentary Geology in Ireland - Travel. 1 Hour.

Travel portion of GEOL 511. See GEOL 511 for description.

GEOL 522. Surficial and Glacial Geology. 3 Hours.

PR: GEOL 321 or GEOG 321 or consent. Analysis of late Cenozoic landscapes, especially those caused by glaciers or otherwise influenced by global climate change. Required weekend field trips at student's expense. (Also listed as GEOG 522.).

GEOL 525. Problems in Geomorphology. 3 Hours.

GEOL 543. Tectonics. 3 Hours.

PR: GEOL 341 and GEOL 311; undergraduates need Consent. Investigation of patterns and processes of large-scale deformation mechanisms that shape the earth. Focuses on the structural evolution and modeling process of various plate boundaries.

GEOL 556. 3-D Seismic Visualization. 3 Hours.

This course focuses on the application of 3-D seismic data visualization and interpretation technologies to the characterization of subsurface structure, facies, and reservoirs, with particular reference to hydrocarbon exploration and CO₂ sequestration.

GEOL 558. Seismic Attribute. 3 Hours.

PR: GEOL 341 and GEOL 311 and MATH 155. The effective seismic attribute technologies and attribute interpretation workflows, their application to the characterization of subsurface structures, facies, and reservoir properties, with particular reference to hydrocarbon exploration and CO₂ sequestration.

GEOL 562. Quantitative Hydrogeology. 3 Hours.

PR: MATH 156 or GEOL 351 and GEOL 463 or Consent. Mathematical and computer analysis of groundwater flow, aquifer systems, radial-flow solutions; well/aquifer test methods; superposition, boundaries; dispersive/advective transport.

GEOL 564. Environmental Hydrogeology. 4 Hours.

PR: GEOL 101 and GEOL 102 and GEOL 463 and (PR or CONC: GEOL 562). Seminar reviewing groundwater occurrence, flow, quality, and exploration in various geologic terrains; groundwater pollution and dewatering; and groundwater technology. Includes topical literature review.

GEOL 575. Imperial Barrel Competition. 3 Hours.

The students will participate in the Imperial Barrel Award competition sponsored by the American Association of Petroleum Geologists (AAPG). They will evaluate a real-world petroleum basin using industry seismic and well data and will make a presentation to a panel of professional judges recommending an exploration strategy. Travel to the regional and national AAPG meeting may be required.

GEOL 579. Applied Petroleum Geoscience. 3 Hours.

Students work in teams to conduct integrated characterization of a petroleum reservoir, develop numerical simulation, consider technical options, perform economic analyses and make a final report to the company/organization.

GEOL 580. Organic Contaminant Geochemistry. 3 Hours.

This course focuses on fundamental chemical properties and structures of organic contaminants that control their functionality, fate, and transport in the environment. Natural organic matter and inorganic phases are discussed relative to contaminant mobility.

GEOL 585. Optical Mineralogy and Petrology. 3 Hours.

PR: GEOL 285. Introduction to the optical properties of minerals and the use of the petrographic microscope. Interpretation of sedimentary, igneous, and metamorphic rocks based on microscopic examination of thin sections. (Offered alternate years.).

GEOL 586. Advanced Isotope Geochemistry. 3 Hours.

PR: GEOL 486. Advance the understanding of isotopic systems by comprehensive discussion of selected research publications. Laboratory exercises will provide hands-on training in stable isotope measurement techniques. Study topics will focus on use of isotopes to address research questions in variety of fields, including geology, biology, forensics, environmental sciences and energy.

GEOL 588. Aqueous Geochemistry. 3 Hours.

PR: GEOL 101 and CHEM 112 or CHEM 116, or Consent. Review of basic chemical principles as they apply to aqueous geochemical environments. Properties of water and the types, sources, and controls of the common and environmentally significant chemical species dissolved in water.

GEOL 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOL 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOL 601. Graduate Professional Development and Scientific Integrity. 3 Hours.

This course aims to prepare graduate students for work in professional geosciences settings and train them in the necessary skills required to successfully navigate their graduate program. Topics covered include grant applications and scientific publications, communication within a professional setting, and geoscience careers and applying for jobs.

GEOL 615. Advanced Stratigraphic Methods. 3 Hours.

Advanced discussion of stratigraphic correlation techniques, including sequence stratigraphy, to analyze deposition of clastic and carbonate sediments, with emphasis on assessing porosity development in sandstones and limestones, organic matter deposition, and flow of fluids, such as water, gas and oil, through rock.

GEOL 616. Advanced Sedimentation. 4 Hours.

PR: GEOL 311 or Consent. (Required field trips at student's expense.) Origin of sedimentary rocks; principles involved in interpretation of ancient geography, climates, animals, and plants. Emphasis on detrital sediments and rocks.

GEOL 621. Advanced Fluvial Geomorphology. 3 Hours.

PR: GEOL 321 or GEOG 321 or Consent. Analysis of stream processes, landforms, deposits, including paleohydrology and Appalachian surficial geology. (Required weekend field trips at student's expense; also listed as GEOG 521.).

GEOL 632. Paleocology. 3 Hours.

PR: GEOL 331 and GEOL 311 or Consent. Methods of paleoecologic analysis in sedimentary geology. Topics include trace fossil analysis, shell biogeochemistry, community paleoecology, biofacies analysis of basins, and Precambrian paleoecology.

GEOL 642. Advanced Structural Geology. 3 Hours.

PR: GEOL 341. Theoretical and observational aspects of the development of geological structures. Problems ranging from the microstructural to the orogenic scale will be addressed.

GEOL 645. Basin Analysis. 3 Hours.

PR: GEOL 341 and GEOL 311 or equivalent. The origin, development, and distribution of basins and the structure found within basins throughout the world are studied. The techniques used for investigating basin evolution are emphasized. The effects of basin processes on the occurrence of energy resources are addressed.

GEOL 659. Quantitative Methods in Geoscience. 3 Hours.

PR: STAT 312 or STAT 511 or Consent. Brief review and introduction to multivariate quantitative techniques as applied to geology and geography.

GEOL 665. Groundwater Modeling. 4 Hours.

PR: GEOL 562 or Consent. Theory and application of groundwater flow modeling, focusing on MODFLOW; numerical methods; discretization and boundaries; parameterization and calibration; problems and case histories.

GEOL 666. Karst Geology. 3 Hours.

PR: Consent. Review of karst terrain hydrogeology and geomorphology, emphasizing origins and nature of caves, sinkholes and other karst landforms, environmental problems of karst, and its water and mineral/ petroleum resources.

GEOL 680. Masters Project Research. 1-5 Hours.

Planning and presentation of a professional project, including proposal, work plan execution, and project report. Status reports and timeline planning. Must be taken in two consecutive semesters, totaling to 6 credits.

GEOL 681. Grad Internship in Geology. 1-6 Hours.

PR: Be enrolled in the Geology MS with a Professional Studies AOE and consent. To obtain practical work experience in a professional setting while obtaining skills and knowledge as a geologist.

GEOL 682. Masters: Professional Studies Track Cohort Seminar. 1 Hour.

PR: Registered students in the Geology MS - Professional Studies Track. This seminar will provide graduate students with the information, tools and resources needed to succeed in the Masters of Geology Professional Studies Track.

GEOL 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of geology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

GEOL 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GEOL 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GEOL 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GEOL 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOL 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Series of meetings that may include research presentations by students, faculty, or visitors; discussions of professional issues or current literature; or other varying topics.

GEOL 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GEOL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GEOL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit, but who wish to meet residence requirements, use the University facilities and participate in its academic and cultural programs. NOTE: Graduate students not actively involved in course work or research or enrolled, through enrollment in his/her departments Graduate Colloquium, to consult with graduate faculty, participate in both formal and informal academic activities sponsored by his/her program and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for master's programs.

GEOL 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of geology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

GEOL 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GEOL 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GEOL 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GEOL 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

GEOL 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

GERMAN (GER)**GER 590. Teaching Practicum. 1-3 Hours.**

PR: Consent. Supervised practice in college teaching of German. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

GER 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GER 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GER 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GER 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GER 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GER 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of German. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

GER 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GER 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

GER 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GER 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

GER 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GER 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

GER 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

GER 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

GER 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

GER 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GERONTOLOGY (GERO)

GERO 512. Public Policy of Aging. 3 Hours.

Policy analysis of public programs for senior citizens - Older Americans Act, Medicare-Medicaid and Social Security. Discussion of future of these programs and societal response. Emphasis on senior programs in West Virginia. (Equivalent to GERO 412).

GERO 628. Aging Women & Cultural Issues. 3 Hours.

This course will use a multi-disciplinary approach to examine the impact of gender, race/ethnicity, and culture on aging, and the aging population.

GERO 645. Fundamentals of Gerontology. 3 Hours.

Introduction to the multidisciplinary field of gerontology and the biological, psychological, social, and spiritual aging processes. Examination of challenges and opportunities in older adulthood. Examination of the growth, diversity, and resilience of older adults and their family. Analysis of policies and programs designed to assist this population.

GERO 681. Rural Gerontology. 3 Hours.

Contemporary knowledge and understanding of aging in small towns and rural areas. Exploration of unique challenges and opportunities facing rural elders and their families and the professionals who work with them. Examination of public policies that impact this population and health care and social service delivery within the rural context.

GERO 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

GERO 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

GERO 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

GERO 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

HISTORY (HIST)

HIST 517. German Central Europe: Empires, States and Nations, 1648-1900. 3 Hours.

Explores the Habsburg Monarchy and Holy Roman Empire, following devastation of 30 years of War, Enlightenment and State-building, Industrialization and Nation-building until the eve of the Great War.

HIST 518. Twentieth Century German Central Europe. 3 Hours.

Explores the two World Wars, Holocaust, the Cold War, National Socialist, Communist, and Democratic regimes and Austria as well as the reunification of Germany following Revolutions of 1989.

HIST 525. History of Modern China. 3 Hours.

Provides an overview of Chinese history with an emphasis on major events since the mid-19th century, placed in a broad context of the important political, economic, social, and diplomatic events in China's historic past.

HIST 526. History of Modern Japan. 3 Hours.

Provides an overview of Japanese history with an emphasis on major events since the mid-19th century, placed in a broad context of the important political, economic, social, and diplomatic events in Japan's historic past.

HIST 558. United States Cultural History 1819-1893. 3 Hours.

Examines the cultural panics about identity and sensibility produced by capitalism, slavery, and war in the nineteenth-century United States.

HIST 575. Hollywood and History. 3 Hours.

Examines twentieth century American culture, politics and society through film. It explores the relationship between film and history, using films as primary sources for understanding the past and it examines how film is used in teaching history.

HIST 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 600. Cultural Resource Management. 3 Hours.

PR: Consent. Explores principles and practices of managing cultural and material historic resources, with an overview of best practices, federal requirements, and fundamental skills expected of the practitioner.

HIST 605. Historical Administration and Governance. 3 Hours.

Exploration of professional standards, governance, grant writing, and financial sustainability for leadership roles in historical societies, archives, museums, and other cultural agencies that collect and preserve historical material. Through examination of institutional histories, students will compare models for shaping institutional policy, procedures, planning, and visioning.

HIST 608. Introduction to Oral History: Methods and Practice. 3 Hours.

Students will learn the basics of oral history methodology. We will discuss the process of documenting, recording, and preserving oral history interviews following best practices, and we will discuss how to interpret and analyze oral sources in the fields of history and public history.

HIST 609. Field Methods in Historic Preservation. 3 Hours.

Outlines professional historic preservation fundamentals associated with inquiry, documentation and analysis. A variety of research approaches expose students to both primary and secondary sources that are typically utilized when conducting reconnaissance or intensive level historic surveys or in preparing HABS/HAER or NRHP documentation.

HIST 610. Historic Site Interpretation. 3 Hours.

Introduction to the craft of historic site interpretation. Readings, lectures, and field trips will explore current issues, approaches to developing meaningful experiences for visitors, and the transmission of culture through historic places.

HIST 611. Archival Management. 3 Hours.

PR: HIST 412. Principles and practices of archival work within a laboratory context. Includes lectures and selected readings illustrated by holdings and policies of West Virginia and Regional History Collection of the WVU Library.

HIST 613. Local History Research Methodology. 3 Hours.

Emphasis on research methods applicable to any locality; includes legal records, oral records, secondary sources, photographs, maps, and government documents.

HIST 614. Internship in Public History. 1-6 Hours.

PR: Consent. A professional internship at a historical agency. Supervision is exercised by history department faculty and the host agency. Written and oral research report required. (Grading may be P/F.).

HIST 615. Museum Studies. 3 Hours.

Introduction to museum management and curation of collections of historic or archaeological significance. Students will learn the basic skills necessary to work with and use museum collections.

HIST 620. Practicum in Cultural Resource Management. 3 Hours.

Professional placement or scholarly research project designed to be the capstone experience for students in the CRM graduate certificate program. Placement is tailored to the area of student interest.

HIST 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HIST 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to a thesis, problem report, research paper, or equivalent scholarly project, or dissertation. (Grading may be S/U.).

HIST 700. Historiography. 3 Hours.

Core course for entering graduate students: critical survey of important contemporary approaches to history writing, methodological practices, and current issues in the field.

HIST 701. Readings in Medieval History. 3 Hours.

Examination of the literature, bibliography, sources, and research methods on selected problems in medieval history, using discussion and written reports on assigned readings. (May be repeated for a maximum of 6 hours.).

HIST 702. Seminar in Medieval History. 3 Hours.

PR: HIST 701; (Reading knowledge of Latin and a modern European language strongly recommended.) Directed examination of bibliographic sources and historiographical issues on selected aspects of the Middle Ages, leading to preparation of a research paper based on primary sources.

HIST 705. Readings in Early Modern History 3 Hr. 3 Hours.

Directed readings on selected major historiographical themes in European history relating to the period from the Renaissance to the French Revolution.

HIST 706. Seminar in Early Modern History. 3 Hours.

Research and writing of an article-length paper based on extensive and/or in-depth analysis of early modern primary sources. Class presentations and discussions of colleagues' work.

HIST 707. War and Society in a Transnational Context. 3 Hours.

The course examines the broad theme of War and Society in a transnational context from the late 1600s to Cold War. The course is designed to help graduate students establish a foundation for further research, to provide opportunities to strengthen their command of European history as a teaching field and to enhance their ability to think comparatively about historical topics.

HIST 717. Readings In Modern European History. 3 Hours.

The object of this course is to familiarize graduate students with the main themes and approaches in the historiography of Modern Europe from the Enlightenment to the end of the twentieth century. (May be repeated once.).

HIST 718. Seminar in Modern European History. 3 Hours.

A research seminar in selected topics in modern European history. One major paper and extensive reading based on available source material is required. A reading knowledge of the appropriate language is required, if applicable.

HIST 721. Readings in Asian History. 3 Hours.

Intensive readings in the history of East Asia (especially China and Japan) since the nineteenth century; students should normally have had HIST 425 and 426, or their equivalents; reviews, as well as bibliographical and historiographical essays, required. (May be repeated once.).

HIST 725. Readings in African History. 3 Hours.

This course will normally focus on readings and discussion on problems in the history of pre-colonial Africa, the major works in African history, and recent interpretations in the field. (May be repeated once.).

HIST 726. Seminar in African History. 3 Hours.

The seminar will normally focus on eastern Africa in the colonial period. Location and use of source materials will be emphasized as well as economic and political developments. Students will spend considerable time in research and writing on selected aspects of eastern African history. (May be repeated once.).

HIST 729. Readings in Latin American History. 3 Hours.

Critical examination of selected sources and topics for understanding and interpreting Latin American history. (May be repeated once.).

HIST 731. Readings In American History: 1585-1763. 3 Hours.

Supervised readings and reports designed to prepare students for intensive study in a seminar or for field examinations in colonial American history. (May be repeated once.).

HIST 732. Seminar in American History: 1585-1763. 3 Hours.

PR: HIST 331 or consent. Directed research on colonial American history, using original and secondary materials. (May be repeated once.).

HIST 750. Public History Methods. 3 Hours.

This course provides the foundations of public history as students examine approaches to historical interpretation for public audiences. Topics will include client-driven research, commemoration, and cultural heritage tourism.

HIST 757. Readings in United States History: 1787-1850. 3 Hours.

Critical examination of major works and themes on the political, economic, social, and legal formation of the nation. (May be repeated once.) (Alternate years.).

HIST 758. Seminar in United States History: 1787-1850. 3 Hours.

Directed research in early United States history. Research will include primary and secondary sources. (May be repeated once.) (Alternate years.).

HIST 759. Readings in United States History: 1840-1898. 3 Hours.

Survey of interpretative literature on Sectionalism, Civil War, Reconstruction and Gilded Age. Assignments are both oral and written reports on assigned readings and a critical essay on some aspect of American historiography for this period.

HIST 760. Seminar in United States History: 1850-1898. 3 Hours.

Directed research in mid-and late 19th century American history, including guidance in methods of research and manuscript preparation. (May be repeated once.).

HIST 763. Readings in United States History: 1898-Present. 3 Hours.

Readings and class-led discussion of one paperback book per week, and preparation of a paper based on these books and the class discussion of them. (Course may be repeated for credit.).

HIST 764. Seminar in United States History: 1898-Present. 3 Hours.

Directed research in recent American history including guidance in methods of research and manuscript preparation. May be repeated once.

HIST 765. Readings in United States Diplomatic History. 3 Hours.

Readings in U.S. Diplomatic History with an emphasis on the 20th century.

HIST 766. Seminar in United States Diplomatic History. 3 Hours.

Directed research in the history of U.S. foreign policy with emphasis on 20th century including guidance in methods of research and manuscript preparation.

HIST 773. Readings in Appalachian Regional History. 3 Hours.

A course for graduate students and seniors in the history of West Virginia and neighboring states, which form what is known as the Trans-Allegheny or Upper Ohio region. (May be repeated once.).

HIST 774. Seminar in Appalachian Regional History. 3 Hours.

A seminar for graduate students in the history of West Virginia and neighboring states, which form what is known as the Trans-Allegheny or Upper Ohio region. (May be repeated once.).

HIST 782. Readings in United States Social History. 3 Hours.

The objective of the course is to establish for graduate students usable frames of reference for selected topics in social history by examining the ways in which historians have written about these topics. (Course may be repeated for credit.).

HIST 785. Readings in Environmental History. 3 Hours.

Examines broad themes including settlement patterns, attitudes toward nature, the rise of ecological science, and agricultural and industrial practices. Explores historiographical and methodological issues. (May be repeated once.) (Alternate years.).

HIST 786. Seminar in Environmental History. 3 Hours.

Directed research involving primary and secondary sources. Will focus on regional case studies and examination of broad intellectual and policy themes. (May be repeated once.) (Alternate years.).

HIST 787. Readings in World History. 3 Hours.

Core course for teaching concentration in world history; review of selected exemplary and recent readings in world history; evaluation of textbooks and teaching materials; composition of syllabi, lectures, and assignments.

HIST 789. Teaching History Online. 3 Hours.

Designed to provide graduate students with the training to create an online course in History and prepare them to deliver it. Through class discussions and meetings with the instructor, students will be exposed to software tools to implement sound pedagogical practice online, different approaches to online instruction, and standards guiding online teaching in Higher Education. (Grading will be P/F).

HIST 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practices in college teaching of history. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibilities. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

HIST 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

HIST 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

HIST 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

HIST 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

HIST 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

HIST 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

HIST 900. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). The continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

HIST 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on pass/fail grading scale and do not apply as graduate credit toward a degree program.

HUMANITIES (HUM)**HUM 591. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANGUAGE TEACHING METHODS (LANG)**LANG 521. English as a Second Language Methods. 3 Hours.**

Theory and practice of teaching English as a second language; techniques and approaches for teaching speaking, listening, reading, and writing skills.

LANG 522. Computer Assisted Language Learning. 3 Hours.

Examines CALL (Computer Assisted Language Learning) methodologies, introduces principles of CALL evaluation, explores current CALL practices in language teaching, develops web-based CALL materials, and reviews CALL research.

LANG 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LANG 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LANG 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LANG 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LANG 610. Methods of Research. 3 Hours.

This class covers basic research skills and professional norms in the field of applied linguistics. Topics include: finding, reading, synthesizing, and evaluating primary research; research questions, research design, sampling strategies, data collection procedures, and data analysis in quantitative and qualitative methods; and proposing research projects.

LANG 621. Teaching Foreign Language in College. 3 Hours.

CONC: LANG 690. Methods and techniques of teaching a foreign language at the college level.

LANG 622. English as a Second Language Theory. 3 Hours.

PR: LING 101 or LING 311. Explores factors and processes involved in the acquisition of English as a second language and their implications for classroom instruction.

LANG 624. Second Language Writing. 3 Hours.

PR: LING 101 or equivalent. A study of how adults learn to write in a second language and how to help them improve their writing.

LANG 625. Language Assessment. 3 Hours.

Introduces fundamental principles of language testing and helps students develop skills in test development, item analysis, interpretation of test results.

LANG 626. Literacy in a Second Language. 3 Hours.

Reviews theoretical perspectives on reading and literacy development and explores research studies that cover different areas in second language reading and literacy (biliteracy).

LANG 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of languages. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LANG 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LANG 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LANG 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LANG 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LANG 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LANG 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LANG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

LANG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LANG 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LANG 930. Professional Development. 1-6 Hours.

Professional Development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

LEGAL STUDIES (LEGS)**LEGS 610. Law and the Legal System. 3 Hours.**

Introduction to the law and its functions, the structure of the U.S. legal system, and the actors in the legal system.

LEGS 620. Researching the Law. 3 Hours.

Provides experience in locating and interpreting primary and secondary legal authority; federal and state constitutions; agency rules and regulations.

LEGS 640. Administrative Legal Process. 3 Hours.

Explores the role of administrative agencies in making law.

LEGS 645. Judicial Legal Process. 3 Hours.

Introduction to the structure of the U.S. judicial system. Focuses on how beliefs and social conditions influenced the development of the United States Constitution, the institution of judicial review, and judicial participation in governing.

LEGS 650. The Legislative Process. 3 Hours.

Examines how legislation develops and implications of recent legislative reform enactments and proposals.

LEGS 660. Dispute Resolution. 3 Hours.

Theoretical and practical examination of dispute resolution processes and assessment of the appropriateness of dispute resolution for particular legal disputes.

LEGS 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LEGS 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LEGS 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LEGS 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LEGS 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/ U.).

LEGS 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LEGS 700. Research Capstone. 3 Hours.

Research activities leading to a scholarly project applying and extending knowledge gained across the master of legal studies program coursework.

LEGS 720. Media and the Law. 3 Hours.

Survey of mass media and the law, implications of existing law, and proposed changes.

LEGS 730. Employment Law. 3 Hours.

Explores law related to workers compensation, disability insurance, affirmative action/equal opportunity policies, workplace, workplace discrimination and related federal and state statutes.

LEGS 731. State, Corporate, and Organizational Fraud. 3 Hours.

PR: MLS major or consent. Typologies of fraud and white-collar crime in occupational, governmental, corporate, financial, technical, and professional fields. Examination of compliance in healthcare settings from providers to suppliers; governmental agencies relating to homeland security including computer-cyber crime, and; prosecution via the criminal justice system and civil systems.

LEGS 750. Criminal Law and Procedure. 3 Hours.

Covers investigative stages of search and seizure, interrogation, and identification. Familiarizes students with prosecutorial stages and evidentiary issues.

LEGS 751. Punishment and Corrections. 3 Hours.

Introduction to certain bodies of law in the areas of punishment and corrections, including statutory codes, common law doctrines, and executive agency rules. Focuses on the application of rules that govern those who enforce our system of punishment.

LEGS 752. Homeland Security. 3 Hours.

Introduction to current public management policies and issues relevant to security of the United States. Provides both traditional students and current practitioners with a broad, up-to-date, multidisciplinary overview of homeland security as a contemporary subject of intense interest and inquiry, and as an emerging academic discipline.

LEGS 753. Immigration and Border Security. 3 Hours.

This course provides knowledge of the history of immigration to the United States, the current state of affairs and the legal implications of the legal system.

LEGS 754. Military Justice. 3 Hours.

Survey and analysis of U.S. Military Justice practice as experienced by Judge Advocates and civilian practitioners. Emphasizes unique issues that arise in the military context.

LEGS 760. Administrative Ethics. 3 Hours.

Analysis of ethical issues in the law and the administrative decision making process.

LEGS 770. Healthcare Law. 3 Hours.

Examines law and health care regulations related to provision of healthcare and issues related to liability.

LEGS 771. Legal Issues for Adults in Care. 3 Hours.

PR: MLS major or consent. Overview of all areas of the law which concern adult care such as living facilities, insurance, estate planning, probate, age discrimination, durable powers of attorney, right-to-die issues, trusts, disability planning, long-term care, guardianship, Social Security, and elder abuse.

LEGS 780. Constitutional Law. 3 Hours.

Examines the concept of constitutionalism, the relationships between the branches of government and between national and state governments, and the role of the Constitution in protecting individual liberties.

LEGS 793. Special Topics. 1-6 Hours.

PR: Consent. advanced topics that are not covered in regularly scheduled courses.

LINGUISTICS (LING)

LING 501. Structure of Spanish. 3 Hours.

Description of phonological or grammatical systems of Spanish, with emphasis on contrastive analysis (Spanish/English) and applied linguistics.

LING 511. English as a Second Language Linguistics. 3 Hours.

PR: LING 101 or LING 311. Analysis of English structure for the purpose of teaching it to non-native speakers. Includes identification of problematic aspects and procedures for teaching them effectively.

LING 512. Applied Linguistics. 3 Hours.

PR: LING 311 and prior second language study. Study of the application of linguistic analysis in the areas of language acquisition, instruction, and use.

LING 513. History of Linguistics. 3 Hours.

PR: LING 311 or Consent. Development of linguistics from Greeks and Romans to contemporary researchers with concentration on major linguists and schools of the nineteenth and twentieth centuries.

LING 514. Sociolinguistics. 3 Hours.

PR: LING 101 or LING 311. Linguistic study of geographical and social variation in languages; effects of regional background, social class, ethnic group, sex, and setting; outcomes of conflict between dialect and between languages.

LING 516. Discourse Analysis. 3 Hours.

PR: LING 101 or equivalent. A study of the structural properties of spoken and written texts and how they are related to the contextual factors involved in text production.

LING 517. Cognitive Foundations of Language. 3 Hours.

An investigation of the ways in which generative linguistics fits into the broader intellectual, historical and ideological mosaic of the cognitive sciences.

LING 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of linguistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

LING 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LING 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LING 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LING 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LING 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LING 610. Methods of Research. 3 Hours.

This class covers basic research skills and professional norms in the field of linguistics. Topics include: finding, reading, and evaluating primary research; research questions and research design; formulating and testing hypotheses; basic quantitative issues in the social sciences; and applying to conferences, graduate programs, and jobs.

LING 611. Advanced Phonology. 3 Hours.

PR: LING 411. The form of phonological rules and their organization within a grammar, the structure of phonological representations, and the role of language universals in models of language acquisition.

LING 612. Advanced Syntax. 3 Hours.

PR: LING 412 or Consent. Examination and discussion of theoretical issues in generative-transformational syntax. Focus on specific proposals advanced within the framework of Government- Binding Theory.

LING 613. English as a Second Language Phonetics. 3 Hours.

PR: LING 311. Analysis of American English phonetics including sound segments, stress, rhythm, intonation, and positional variants. Techniques and practice offered for teaching pronunciation to non-native speakers.

LING 614. Psycholinguistics. 3 Hours.

PR: LING 311 or Consent. Provides an insight into the many areas of psycholinguistics study, including language acquisition, sentence processing, animal communication, dichotic listening, aphasia, and semantics.

LING 615. Language Change and Reconstruction. 3 Hours.

PR: LING 311 or equivalent. Exploration of the mechanisms of language change, theories of diachronic linguistics, and techniques for reconstructing unattested languages; concentration on the Indo-European family and its history.

LING 616. Language Typology. 3 Hours.

PR: LING 101 or LING 311 or equivalent. Study of the uniformity and diversity of the world's languages. Which characteristics of human languages are universal and which are subject to cross- linguistic variation. An overview of the main results and methodology of typological research.

LING 620. Spanish Prosody. 3 Hours.

PR: LING 501. The goal of this course is to familiarize students with the prosodic aspects of the Spanish language including the suprasegmental properties of stress, rhythm and intonation. The course will cover their phonetic descriptions in multiple dialects and their relevance in communication for both L1 and L2 Spanish speakers. Theoretical approaches and article discussions will be combined with practical exercises.

LING 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of linguistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

LING 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

LING 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

LING 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

LING 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

LING 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

LING 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

LING 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

LING 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

LING 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

LING 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATHEMATICS (MATH)**MATH 521. Numerical Analysis. 3 Hours.**

General introduction to traditional areas of numerical analysis, emphasizing underlying mathematical theory and computational experience.

MATH 522. Numerical Solution of PDE. 3 Hours.

PR: MATH 261 and computer language. Finite difference and finite element methods for elliptic, parabolic, and hyperbolic problems. Study of properties such as consistency, convergence, stability, conservation, and discrete maximum principles.

MATH 534. Modern Algebra For Teachers 2. 3 Hours.

PR: MATH 341 or MATH 533. Further investigation of algebraic structures begun in MATH 533. (Emphasis on topics helpful to secondary-school mathematics teachers.) Topics include Sylow theory, Jordan-Holder Theorem, rings and quotients, field extensions, Galois theory and solution by radicals.

MATH 535. Foundations of Geometry. 3 Hours.

PR: MATH 251 (Designed especially for secondary mathematics teachers; others admitted with departmental approval obtained before registration.) Incidence geometries with models; order for lines and planes; separation by angles and by triangles; congruence; introduction to Euclidean geometry; geometry.

MATH 541. Modern Algebra 1. 3 Hours.

PR: Adequate background in abstract algebra including group, ring, and field theory, and adequate background in linear algebra. Focuses on Galois theory - the study of roots of single variable polynomials - an application of group theory to the study of field extensions. Covers group actions, Sylow theorems, solvable groups, field extensions, splitting fields, Galois group of a polynomial, fundamental theorem of Galois theory, solvability by radicals, and further topics if time permits.

MATH 543. Linear Algebra. 3 Hours.

PR: MATH 441. Review of theory of groups and fields; linear vector spaces including the theory of duality; full linear group; bilinear and quadratic forms; and theory of isotropic and totally isotropic spaces.

MATH 545. Number Theory 1. 3 Hours.

Introduction to classical number theory covering such topics as divisibility, the Euclidean algorithm, Diophantine equations, congruencies, primitive roots, quadratic residues, number-theoretic functions, distribution of primes, irrationals, and combinatorial methods. Special numbers such as those of Bernoulli, Euler, and Stirling.

MATH 551. Real Variables 1. 3 Hours.

Development of measure theory, Lebesgue integral, function spaces and Lebesgue differentiation.

MATH 555. Complex Variables 1. 3 Hours.

PR: MATH 451. Number systems, the complex plane and its geometry. Holomorphic functions, power series, elementary functions, complex integration, representation theorems, the calculus of residues, analytic continuation and analytic function, elliptic functions, Holomorphic functions of several complex variables.

MATH 560. Introduction to Dynamical Systems and Applications. 3 Hours.

This course is an introduction to the theory of dynamical systems, whose goal is to study the behavior of systems with known laws of evolution. We cover basic topics including fixed points, periodic orbits, linearization, local and global behavior of solutions, bifurcations, and chaos. The theory will be accompanied by applications from biology, chemistry, and physics.

MATH 563. Mathematical Modeling. 3 Hours.

Survey of selected mathematical models used in the physical and biological sciences, in economics, and operations research. Both deterministic and stochastic models are included, as well as the mathematical methods used for analytic and computational analysis.

MATH 564. Intermediate Differential Equations. 3 Hours.

PR: MATH 261. A rigorous study of ordinary differential equations including linear and nonlinear systems, self-adjoint eigenvalue problems, non-self-adjoint boundary-value problems, perturbation theory of autonomous systems, Poincare-theorem.

MATH 566. Intermediate Partial Differential Equations. 3 Hours.

The goal of this course is to study the behavior of mathematical models arising from applied sciences with known boundary and initial conditions. Basic topics include first and second order equations, well-posedness, method of characteristics, energy methods, maximum principle, Green's functions, Duhamel's principle and shock waves. Knowledge of ordinary differential equations is necessary for successful completion of this course.

MATH 567. Advanced Calculus. 3 Hours.

per semester. PR: MATH 261. Primarily for engineers and scientists. Functions of several variables, partial differentiation, implicit functions, transformations; line surface and volume integrals; point set theory, continuity, integration, infinite series and convergence, power series, and improper integrals.

MATH 568. Advanced Calculus. 3 Hours.

per semester. PR: MATH 567. Primarily for engineers and scientists. Functions of several variables, partial differentiation, implicit functions, transformations; line surface and volume integrals; point set theory, continuity, integration, infinite series and convergence, power series, and improper integrals.

MATH 571. Combinatorial Analysis 1. 3 Hours.

PR: One year of calculus. Permutations, combinations, generating functions, principle of inclusion and exclusion, distributions, partitions, compositions, trees and networks.

MATH 573. Graph Theory. 3 Hours.

Basic concepts of graphs and digraphs, trees, cycles and circuits, connectivity, traversability, planarity, colorability, and chromatic polynomials. Further topics from among factorization, line graph, covering and independence, graph matrices and groups, Ramsey theory, and packing theory.

MATH 578. Applied Discrete Mathematics. 3 Hours.

PR: MATH 375 or MATH 378 or MATH 341 or MATH 343 or MATH 283. Topics may include combinatorial optimization, applied coding theory, integer programming, linear programming, matching, and network flows.

MATH 581. Topology 1. 3 Hours.

PR: (MATH 541 or MATH 551 or MATH 560) with a minimum grade of B-. A detailed treatment of topological spaces covering the topics of continuity, convergence, compactness, and connectivity; product and identification space, function spaces, and the topology in Euclidean spaces.

MATH 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. Grading will be P/F.

MATH 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 631. RUME 1: Introduction to Undergraduate Mathematics Education Research. 3 Hours.

PR: (MATH 451 and MATH 452) or MATH 551 or MATH 567. Research literature will provide background for investigating issues in knowing and learning undergraduate mathematics. Students will be introduced to research design, data collection, and qualitative analysis related to investigating aspects of learning undergraduate mathematics.

MATH 641. Modern Algebra 2. 3 Hours.

PR: MATH 545. Concepts from set theory and the equivalence of the axiom of choice. Zorn's Lemma and the Well-Ordering Theorem; a study of the structure of groups, rings, fields, and vector spaces; elementary factorization theory; extensions of ring and fields; modules and ideals; and lattices.

MATH 645. Number Theory 2. 3 Hours.

PR: MATH 305. Introduction to classical number theory covering such topics as divisibility, the Euclidean algorithm, Diophantine equations, congruencies, primitive roots, quadratic residues, number-theoretic functions distribution of primes, irrationals, and combinatorial methods. Special numbers such as those of Bernoulli, Euler, and Stirling.

MATH 651. Real Variables 2. 3 Hours.

PR: MATH 551. A development of the Lebesgue integral, function spaces and differentiation, complex measures, the Lebesgue-Radon- Nikodym theorem.

MATH 681. Topology 2. 3 Hours.

PR: MATH 581. A detailed treatment of topological spaces covering the topics of continuity, convergence, compactness, and connectivity; product and identification space, function spaces, and the topology in Euclidean spaces.

MATH 683. Set Theory and Applications 1. 3 Hours.

PR: (MATH 541 or MATH 551 or MATH 581) with a minimum grade of B-. The course concentrates on the typical methods of set theory, transfinite induction, and Zorn's Lemma with emphasis on their applications outside set theory. The fundamentals of logic and basic set theory are included.

MATH 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

MATH 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

MATH 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

MATH 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project or a dissertation. (Grading may be S/U.).

MATH 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

MATH 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

MATH 732. RUME 2: Learning Theories. 3 Hours.

PR: MATH 631. Students will investigate learning theories related to undergraduate mathematics education research and use these learning theories to formulate research questions and to collect and analyze data.

MATH 733. RUME 3: Advanced Learning Theories. 3 Hours.

PR: MATH 732. Students will expand their understanding of learning theories related to undergraduate mathematics education research and their ability to use these learning theories to formulate research questions and to collect and analyze data.

MATH 745. Analytic Number Theory 1. 3 Hours.

PR: MATH 555 and MATH 645. Selected topics in analytic number theory such as the prime number theorem, primes in an arithmetical progression, the Zeta function, the Goldbach conjecture.

MATH 746. Analytic Number Theory 2. 3 Hours.

PR: MATH 745. Selected topics in analytic number theory such as the prime number theorem, primes in an arithmetical progression, the Zeta function, the Goldbach conjecture.

MATH 747. Advanced Topics in Modern Algebra. 1-6 Hours.

This course will cover selected topics of modern algebra as an extension of the basic material covered in the 541-641 sequence. The topic will be selected from algebraic number theory, noncommutative rings and modules, representation theory, algebraic model theory, homological algebra. (May be repeated for credit with consent.).

MATH 751. Functional Analysis 1. 3 Hours.

PR: MATH 551. A study of Banach and Hilbert spaces; the Hahn-Banach theorem, uniform boundedness principle, and the open mapping theorem; dual spaces and the Riesz representation theorem; Banach algebras; and spectral theory.

MATH 752. Functional Analysis 2. 3 Hours.

PR: MATH 751. A study of Banach and Hilbert spaces; the Hahn-Banach theorem, uniform boundedness principle, and the open mapping theorem; dual spaces and the Riesz representation theorem; Banach algebras; C^* algebras; spectral theory.

MATH 757. Theory of Partial Differential Equations 1. 3 Hours.

PR: MATH 452. Cauchy-Kowaleski theorem, Cauchy's problem, the Dirichlet and Neumann problems, Dirichlet's principle, potential theory, integral equations, eigenvalue problems, numerical methods.

MATH 758. Theory of Partial Differential Equations 2. 3 Hours.

PR: MATH 757. Cauchy-Kowaleski theorem, Cauchy's problem, the Dirichlet and Neumann problems, Dirichlet's principle, potential theory, integral equations, eigenvalue problems, numerical methods.

MATH 771. Matroid Theory 1. 3 Hours.

PR: (MATH 541 or MATH 543) and (MATH 571 or MATH 573). Independent sets, circuits, bases, rank functions, closure operators and close sets, other axiom systems, geometric representations, duality and minors, linear and algebraic representability, connectivity, basics of partial ordered sets, flats and lattices, relationship between lattices and matroids.

MATH 772. Matroid Theory 2. 3 Hours.

PR: MATH 771. Matroid representability, representability over finite fields, algebraic matroids, matroid constructions, higher connectivity of matroids, binary and ternary matroids, the splitter theorem and its applications, submodular functions, matroid intersection theorem, matroids in combinatorial optimizations.

MATH 773. Advanced Topics in Graph Theory. 3 Hours.

PR: MATH 573. (May be repeated for credit toward graduation.) Topics may include: Algebraic graph theory, random graph theory, extremal graph theory, topological graph theory, and structural graph theory.

MATH 777. Advanced Topics in Combinatorics. 3 Hours.

PR: MATH 571. Topics may include: Combinatorics on finite sets, probabilistic methods in combinatorics, enumerations, Polya Theory, combinatorial matroid theory, coding theory, combinatorial identities, infinite combinatorics, transversal theory, and matroid theory. (May be repeated for credit with consent.).

MATH 780. Seminar in Topology. 1-12 Hours.**MATH 783. Set Theory and Applications. 3 Hours.**

PR: MATH 683. The course elaborates on the applications of the transfinite induction, and combines recursion methods with other elements of modern set theory, including the use of additional axioms of set theory, introduction to the forcing method.

MATH 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of mathematics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

MATH 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

MATH 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

MATH 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

MATH 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

MATH 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least on seminar to the assembled faculty and graduate student body of his or her program.

MATH 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or dissertation. (Grading may be S/U.).

MATH 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology). These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

PHILOSOPHY (PHIL)

PHIL 501. Metaphysics. 3 Hours.

Traditional problems associated with universals and particulars, reality and experiences, causality, space and time, matter and mind, the nature of the self, etc.

PHIL 531. Health Care Ethics. 3 Hours.

Topics: Clinician- patient relationship, life-sustaining treatment, physician- assisted death, physician/nurse conflicts, confidentiality, research, reproductive technology, abortion, maternal/fetal conflicts, genetics, rationing, and access.

PHIL 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of philosophy. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain college teaching experience. (Grading may be S/U.).

PHIL 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHIL 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHIL 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHIL 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHIL 692. Directed Study. 1-6 Hours.

PR: Consent. Directed study, reading, and/or research.

PHIL 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHIL 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

PHIL 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHIL 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHIL 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHIL 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PHIL 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking course work credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHYSICS (PHYS)

PHYS 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHYS 611. Introduction to Mathematical Physics. 3 Hours.

PR: Calculus, differential equations, PHYS 111 and PHYS 112 or equivalent. Complex variables: series, contour integration and conformal mapping; ordinary differential equations; Fourier series, Laplace transforms; Fourier transforms; special functions; Bessel functions and Legendre, Hermite differential equations; Poisson's equation, wave equation, and Laguerre polynomials; introduction to partial differential equations.

PHYS 631. Advanced Classical Mechanics 1. 3 Hours.

PR: PHYS 331 and PHYS 332 and differential equations. Lagrange and Hamilton form of equations of motion, rigid bodies, small and nonlinear oscillations. Transformation theory, relativistic dynamics, and systems with an infinite number of degrees of freedom.

PHYS 633. Electromagnetism 1. 3 Hours.

PR: PHYS 333 and PHYS 334 and differential equations. Boundary value problems in electrostatics and magnetostatics. Greens functions. Multipole expansions. Dispersion and absorption of electromagnetic waves propagating in matter.

PHYS 634. Electromagnetism 2. 3 Hours.

PR: PHYS 333 and PHYS 334 and differential equations. Propagation of guided waves. Radiation from antennas, small sources, and relativistic particles. Fraunhofer and Fresnel diffraction. Special relativity and the covariant formulation of electromagnetism.

PHYS 651. Quantum Mechanics 1. 3 Hours.

PR: PHYS 451. The Schroedinger equations. One-dimensional problems. Operators and Hilbert space. Three-dimensional problems. Orbital and spin angular momentum. One-electron atoms.

PHYS 652. Quantum Mechanics 2. 3 Hours.

PR: PHYS 651. Time-independent perturbation theory. Angular momentum coupling and Clebsch-Gordan coefficients. Time-dependent perturbation theory. Emission and absorption of radiation by atoms. Scattering theory.

PHYS 671. Introduction to Solid State Physics. 3 Hours.

PR or CONC: PHYS 651. Emergence of solid crystalline structure; emergent quasiparticles and band structures; interaction of solids with electromagnetic fields; phases, such as metals, semiconductors, magnets and superconductors; applications.

PHYS 681. Principles of Plasma Physics. 3 Hours.

Plasmas occur naturally in electrical discharges and in space and are produced artificially in laboratory devices. This course is a survey of plasma phenomena using fluid and kinetic models.

PHYS 685. Solar and Space Physics. 3 Hours.

Heliophysics (solar and space physics) is the study of the sun and its magnetic environment (the heliosphere). Discussion of solar interior, solar corona, solar wind. Also includes bow shock, terrestrial magnetosphere and solar wind-magnetospheric coupling, radiation belts, aurora, ionosphere, observational and numerical techniques for space physics.

PHYS 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHYS 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PHYS 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHYS 710. Nonlinear Dynamics. 3 Hours.

PR: PHYS 631. Flows, fixed-point analysis, and bifurcations in 1D, 2D, and 3D using analytical, numerical, and geometrical approaches. Limit cycles, chaos, fractals, strange attractors, iterated maps, and Hamiltonian systems.

PHYS 725. Advanced Atomic and Molecular Physics 1. 3 Hours.

PR: PHYS 651. Review of one-electron atoms leading to approximation schemes for many-electron atoms. Thomas-Fermi theory, Hartree-Fock theory, and central field approximation. LS, JJ, and intermediate coupling of angular momentum. Relativistic effects.

PHYS 761. Statistical Mechanics. 3 Hours.

PR: PHYS 461 and PHYS 651. Ensemble theory, applications to noninteracting systems, as well as perturbative and approximate treatment of interactions. Typical applications include equilibrium constants, polymers, white dwarfs, metals, superfluids, magnetic transitions.

PHYS 771. Advanced Solid State Physics. 3 Hours.

PR: PHYS 671. Universal paradigms revealed in solids state physics; hierarchy of effective theories to determine mechanical, electronic, magnetic and optical properties; non-interacting classical and quantum approaches; interacting quantum many-body approaches.

PHYS 772. Semiconductor Physics. 3 Hours.

PR: PHYS 771. Semiconductor band structure. Intrinsic and extrinsic semiconductors. Hall effect and magneto-transport effects. Fundamentals of nanostructures and quantum structures. Semiconductor device physics.

PHYS 773. Collective Phenomena in Solids. 3 Hours.

PR: PHYS 771. Paramagnetism. Magnetic phenomena in thin films and multilayers. Phase transitions: mean field theories and fluctuations. Superconductivity and BCS theory.

PHYS 774. Optical Properties of Solids. 3 Hours.

PR: PHYS 771. Absorption and dispersion in light propagation. Quantum wells and quantum dots. Solid state laser materials. Nonlinear optics and parametric amplification.

PHYS 782. Computer Simulation of Plasma. 3 Hours.

PR: (PHYS 481 or PHYS 781) and PHYS 633; programming proficiency in C, FORTRAN, or BASIC. Projects teach mathematical and physical foundations of computer simulation algorithms and develop and refine physical understanding and intuition of phenomena encountered in plasma research.

PHYS 783. Advanced Kinetic Theory of Plasmas. 3 Hours.

PR: PHYS 481 and PHYS 631 and PHYS 634. The Vlasov equation, quasilinear theory, nonlinear phenomena. Plasma waves and instabilities. Landau damping and finite-Larmor-radius effects.

PHYS 784. Advanced Magnetohydrodynamic Theory of Plasmas. 3 Hours.

PR: PHYS 481 and PHYS 631 and PHYS 634. The fluid approximation. Magnetohydrodynamic description of plasma equilibrium and stability. Confinement schemes and plasma waves. Emphasis on analytic theory.

PHYS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of physics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

PHYS 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PHYS 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PHYS 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field. field.

PHYS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PHYS 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PHYS 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PHYS 799. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

PHYS 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g., education, community health, geology.) These tuition-waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

POLITICAL SCIENCE (POLS)

POLS 500. Introduction to Political Research. 3 Hours.

Introduction to the research methods and techniques used in political and policy analysis. Topics include logic of inquiry, research design, measurement, and survey and unobtrusive research.

POLS 501. Quantitative Political Analysis. 3 Hours.

Application of a range of statistical techniques in political and public policy research. Includes use of selected computer software commonly used in political science and policy analysis.

POLS 502. Advanced Quantitative Methods. 3 Hours.

PR: POLS 501. Methods surveyed include multiple linear regression, time-series analysis, causal modeling, and linear programming.

POLS 522. Racial & Ethnic Politics. 3 Hours.

This course examines contemporary research on the influence of race and ethnicity on U.S. politics. The focus is on African American politics, and, to a lesser extent, Latino or Hispanic politics; the politics of other racial and ethnic groups are also discussed.

POLS 530. Policy Analysis. 3 Hours.

Overview of the field of political science and the sub-field of public policy studies. Focuses on the issues and problems involved in studying policymaking, and an assessment of policy analysis as a mode of thinking and inquiry. (3 hr. seminar.).

POLS 536. Politics of Agenda Setting. 3 Hours.

Examines the social, economic, institutional and political influences on the development of public problems and their placement on the policy agenda. (3 hr. seminar.).

POLS 550. Comparative Politics. 3 Hours.

Survey of the subfield of Comparative Politics within Political Science. Course includes an introduction to the major methods and theoretical perspectives employed in the field including an overview of rational, structural and cultural perspectives.

POLS 551. Comparative Political Institutions. 3 Hours.

This course covers core debates in the study of comparative political institutions. Students discuss constitutional engineering, parliamentary versus presidential systems, electoral rules, party systems, representation, legislative rules of procedure, federalism, veto points, and other topics.

POLS 555. Comparative Public Policy. 3 Hours.

Comparison of public policy stages in several advanced industrial democracies with emphasis on various explanations of public policy in these countries in different policy areas. (3 hr. seminar.).

POLS 559. Contentious Politics. 3 Hours.

This is a course sub- field of political science, encompassing International Relations, Comparative and American Politics. This course presents a survey of the main concepts, theoretical debates, and methodological approaches in the field.

POLS 560. International Theory and Policy. 3 Hours.

Survey of theoretical approaches in the study of international relations, covering major works in the realist, neo-liberal, and foreign policy literature. Emphasis on the place of foreign policy explanations within the wider, systemic international relations literature. (3 hr. seminar.).

POLS 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

POLS 596. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her choice.

POLS 603. Advanced Quantitative Analysis. 3 Hours.

POLS 603. Advanced Quantitative Analysis. 3 hr. A survey of advanced statistical applications in political science, covering time series analysis, maximum likelihood estimation, and structural equation modeling.

POLS 630. Seminar: American Politics and Policy. 3 Hours.

A survey of classic and contemporary literature on U.S. politics and policy. Emphasis on how various institutions and linkage mechanisms affect the policy process. (3 hr. seminar.).

POLS 638. Seminar: Policy Implementation. 3 Hours.

Research seminar focusing on how the intentions of policy-makers are transformed into programs and policies which have both intended and unintended consequences. Topics include traditional implementation studies, rational choice approaches, neo-institutionalism, and principal-agent theory. (3 hr. seminar.).

POLS 660. International Political Economy. 3 Hours.

Advanced theoretical courses in IPE. Topics include capital financial and trade liberalization, economic development, regionalism, and the intricacies between domestic governments and international economic relations.

POLS 665. Comparative Foreign Policy. 3 Hours.

Application of the comparative method of theoretically assessing the mainly domestic sources of conflict and change in foreign policy beyond the U.S. case and in cross-national and historical perspective.

POLS 666. National Security Policy. 3 Hours.

Overview of security policy issues as both foreign and domestic policy. Traces the development of defense and security, arms transfers, spending tradeoffs, deterrence, game theoretic decision models, intelligence analysis, and terrorism.

POLS 667. Foreign Policy Decision Making. 3 Hours.

This course examines the roots of foreign policy decision making. It examines how ideational, cultural, institutional and political variables constrain decision makers, and how the core psychological characteristics of decision makers shape their behavior.

POLS 670. Professional Seminar in Political Theory. 3 Hours.**POLS 691. Advanced Topics. 1-6 Hours.**

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 703. Internship. 6-9 Hours.

per semester; students may enroll more than once. PR: Consent.

POLS 710. Judicial Politics, Policy and Law. 3 Hours.

Judicial influence on American public policy with emphasis on the political theory of American law, the agenda of disputes, the formulation of public policy by courts, and the effects of judicial policy on politics. (3 hr. seminar.).

POLS 712. American Construction and Political Development. 3 Hours.

The development of American political institutions, with emphasis on theoretical underpinnings of American politics and the role of courts and the Constitution in defining the scope of political change in America.

POLS 715. The American Presidency. 3 Hours.

This course examines how the president interfaces with other power centers in the political system, and assesses the extent to which this institution is capable of meeting what we have come to expect of it.

POLS 728. Congress. 3 Hours.

Students engage research literature on the U.S. Congress, examining theories of member behavior, the role of political parties, the endogenous creation and reform of congressional institutions, and other areas of research on Congress.

POLS 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of political science Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

POLS 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

POLS 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

POLS 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

POLS 794. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

POLS 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

POLS 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

POLS 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PSYCHOLOGY (PSYC)

PSYC 511. Research Design and Data Analysis 1. 3 Hours.

Principles of experimental research and data analysis, with the goal of building both applied skills (e.g., data analysis and interpretation; excel and SPSS) and conceptual knowledge (e.g., probability, normal distributions, null hypothesis testing, analysis of variance).

PSYC 512. Research Design and Data Analysis 2. 3 Hours.

PR: PSYC 511. Inferential statistics and quasi-experimental design strategies, including correlation and regression, and identification of moderation and indirect effects.

PSYC 531. Experimental Analysis of Behavior. 3 Hours.

Research and theory in the psychology of learning. Assessment of traditional and behavior-analytic approaches to the study of positive reinforcement, aversive control, and stimulus control. Includes laboratory work with animals.

PSYC 532. Human Behavior. 3 Hours.

PR: PSYC 531. Review of the role of basic human operant research in testing the generality of animal-based behavior principles, analyzing phenomena that are specific to humans, and extending behavior analysis to traditional psychological problems.

PSYC 533. Applied Behavior Analysis. 3 Hours.

PR: PSYC 531. Methodological, empirical, and conceptual issues in the application of basic research in behavior analysis to problems of social significance.

PSYC 541. Infant Development. 3 Hours.

Examination of psychological literature on prenatal and infant development. Topics include physical, cognitive, perceptual, language, and socioemotional development.

PSYC 542. Child Development. 3 Hours.

Examination of psychological literature on child development. Topics include perception, learning, language, problem solving, social cognition, peer and family relationships, gender, moral development, friendship, aggression, and altruism.

PSYC 543. Adolescent and Young Adult Development. 3 Hours.

Examination of the psychological literature in adolescence and young adulthood. Topics include learning, problem solving, social cognition, peer and family relationships, gender, moral development, friendship, aggression, and altruism.

PSYC 544. Adult Development and Aging. 3 Hours.

Examination of psychological literature on adulthood and aging. Topics include health, cognition, family relationships, personality, psychopathology, work, and retirement.

PSYC 545. Conceptual Issues in Developmental Psychology. 3 Hours.

History, philosophies, and theories of psychological development in the major age periods and the life span; conceptual issues such as nature-nurture, sex differences, cultural differences, life events, rigidity-plasticity, continuity-discontinuity, and competence-performance.

PSYC 546. Methodological Issues in Developmental Psychology. 3 Hours.

Methodological issues in psychological research on the major age periods and the life span. Topics include: validity; reliability; age, cohort, and time of measurement; cross-sectional, longitudinal, and mixed designs; data analytic methods; ethical issues.

PSYC 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 601. Professional Issues in Behavior Analysis. 1 Hour.

(May be repeated for credit.) Survey of professional issues in behavior analysis.

PSYC 602. Professional Issues in Developmental Psychology. 1 Hour.

(May be repeated for credit.) Survey of professional issues in developmental psychology. (Grading may be S/U.).

PSYC 603. Professional Issues in Clinical Psychology. 1 Hour.

(May be repeated for credit.) Survey of professional issues in clinical psychology. (Grading may be S/U.).

PSYC 606. Seminar on Teaching Psychology. 1 Hour.

(May be repeated for credit.) Review and discussion of methods and issues in college teaching of psychology.

PSYC 607. Ethical and Legal Issues in Psychology. 3 Hours.

Surveys the ethical guidelines and major legal issues confronted by psychologists.

PSYC 608. Professional Issues - Behavioral Neuroscience. 1 Hour.

Survey of professional issues in behavioral neuroscience.

PSYC 609. Ethics in Behavior Analysis. 3 Hours.

PSYC 609. Ethics in Behavior Analysis. 3-Hr. Surveys the ethical guidelines and standards for behavior analysts.

PSYC 611. Single-Subject Research Methods. 3 Hours.

PR: PSYC 511 and PSYC 531. Critical evaluation of single-subject designs in basic and applied research. Major topics include single-subject methodology's historical and conceptual bases, its relation to group-statistical methods, and its role in behavioral psychology.

PSYC 612. Multivariate Analysis. 3 Hours.

PR: PSYC 511. Data analysis techniques in psychology with application to typical research problems. Includes simple matrix algebra, discriminant analysis, multivariate analysis of variance, and an introduction to factor analysis.

PSYC 614. Program Evaluation and Intervention. 3 Hours.

Examines the nature, method, and process of evaluative research, especially as it applies to social and behavioral treatment and service delivery programs.

PSYC 615. Software Design in Psychology. 3 Hours.

PR: Consent. Practical introduction to software development for behavioral research applications including real-time experimental control and data collection, graphical user interfaces, and data analysis; general algorithmic methods; event-driven models. No programming background required.

PSYC 630. Behavior Analysis Practicum. 3 Hours.

PR: PSYC 533 and consent. Supervised applied behavior analysis experience integrated with a seminar emphasizing group solutions to problems that individuals encounter in students' applied projects. Progress and final project reports are presented and evaluated. (1 hr. sem., 2 hr. practicum.).

PSYC 650. Behavioral Neuroscience Methods. 3 Hours.

An overview of the most common research methods and techniques used in the behavioral neuroscience field.

PSYC 651. Behavior Pathology. 3 Hours.

Advanced study of diagnostic classification, functional analysis, and experimental research in psychopathology of child, adult, and geriatric adjustment problems.

PSYC 652. Clinical Interviewing. 3 Hours.

Clinical interviewing assessment, and interviewing skills acquisition.

PSYC 653. Behavioral and Psychological Assessment 1. 3 Hours.

Conceptual and methodological bases for behavioral assessment; comparison of trait-oriented versus behavioral assessment; design and evaluation of measurement systems, particularly self-report, ratings by others, and direct observation, within the basic framework of generalizability theory.

PSYC 654. Behavioral and Psychological Assessment 2. 4 Hours.

PR: PSYC 653. Evaluation of clinically relevant behavior and environments by means of testing and other methods. Includes test selection, administration, and report writing.

PSYC 655. Research Methods in Clinical Psychology. 3 Hours.

Fundamental knowledge of research methodology in the science of clinical psychology. Acquisition of skills in research design, evidence-based practice of psychology, scholarly review, and scientific writing.

PSYC 656. Grant Writing in Psychology. 3 Hours.

Essential writing skills for securing extramural funding for research programs in the behavioral sciences.

PSYC 660. Clinical Psychology Practicum. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Supervised practice of psychological techniques in clinics or institutional settings; experience in psychological testing, interviewing, report writing, case presentation, interpretation of tests and supportive counseling.

PSYC 661. Behavior Therapy. 3 Hours.

Reviews the roots and development of behavioral interventions. Applied clinical intervention is stressed in concert with evaluation and research application.

PSYC 670. Clinical Child Psychology Practicum. 1-15 Hours.

(May be repeated for credit.) PR: Consent. Supervised field experience in various aspects of delivering psychological services directly or indirectly to children. Experience in assessment, treatment, program design, administration, and evaluation.

PSYC 671. Child Behavior Therapy. 3 Hours.

Assessment, intervention, and evaluation strategies appropriate for childhood disorders and based on behavior principles.

PSYC 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 694. Seminar. 6 Hours.

Special seminars arranged for advanced graduate students.

PSYC 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Series of meetings that may include research presentations by students, faculty, or visitors; discussions of professional issues or current literature; or other varying topics.

PSYC 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

PSYC 701. Advanced Professional Issues in Psychology. 1 Hour.

(May be repeated for credit.) Discussion of professional issues in psychology relevant to advanced doctoral students. (Grading May be S/U.).

PSYC 711. Seminar in Methodology. 1 Hour.

(May be repeated for credit with consent.) Current problems and techniques in research design, data analysis, and research methods.

PSYC 712. Advanced Longitudinal Methods and Statistics. 3 Hours.

PR: PSYC 612. Analysis of longitudinal methods, with the goal of building both applied skills (e.g., data analysis and interpretation; Mplus) and conceptual knowledge (e.g., studying change/development, end-point versus mean-level change, person-centered).

PSYC 715. Archival Data Analysis. 3 Hours.

PR: PSYC 612. Using existing data sources to answer specific questions with a focus on finding high-quality-data, manipulation and management of data, and writing an empirical paper.

PSYC 721. History and Systems. 3 Hours.

Study of the history of psychology from its roots in physics, biology, and philosophy. The development of American psychology is emphasized.

PSYC 722. Biological Aspects of Behavior. 3 Hours.

PR: Consent. Overviews of the areas of psychological investigation that pertain to the relation between biology and psychology, including neuroscience, psychobiological theories of personality and development, neurological and neuropsychological assessment, psychophysiology, and biologically-based treatment strategies, including basic psychopharmacology.

PSYC 724. Advanced Neuroscience. 4 Hours.

PR: PSYC 722 with a minimum grade of B-. In-depth exploration of nervous system anatomy and physiological processes, including the biological mechanisms underlying emotion, motivation, memory, and disease.

PSYC 725. Social Psychology. 3 Hours.

Survey of current concepts, research, and findings in social psychology. Includes such topics as self and identity, attribution theory, interpersonal perception, social cognition, attitude change, social influence, interpersonal processes, prosocial behavior, aggression, and prejudice.

PSYC 726. Social Cognition. 3 Hours.

Advanced integrative course that uses both cognitive and social psychological theories and methodologies to understand human behavior. Reviews the major theories of social cognition and how these theories can be used to explain human behavior across many domains. Contemporary and classic research supportive of these theories is reviewed.

PSYC 728. Hormones and Behavior. 3 Hours.

PR: Graduate standing. Explores the complex interactions between the endocrine system, brain, and behavior in a broad range of animals, including people. Special emphasis is placed on reproductive hormones, as well as systems of homeostasis, aggression, and biological rhythms.

PSYC 729. Performance Management. 3 Hours.

PR: PSYC 533 with a minimum grade of B-. Best-practice techniques for performance management, including behavioral approaches to performance management in the context of clinical supervision, personnel management, and consultation.

PSYC 730. Advanced Behavior Analysis Practicum. 1-6 Hours.

PR: PSYC 533 or consent. Supervised applied behavior analysis experience in an approved setting.

PSYC 731. Research Issues in Behavior Analysis. 3 Hours.

(May be repeated for credit with consent.) PR: Consent. Examination of research issues in general psychology from a behavior analytic perspective. Topics vary from year to year.

PSYC 732. Behavior Theory and Philosophy. 3 Hours.

PR: PSYC 531 or equivalent. Critical consideration of contemporary concepts, theories, and methods of psychology.

PSYC 733. Stimulus Control and Memory. 3 Hours.

PR: PSYC 531 or consent. Critical review of basic research and theory in discrimination learning, stimulus generalization, and memory.

PSYC 734. Reinforcement and Punishment. 3 Hours.

PR: PSYC 531. Examination of theories of response acquisition, maintenance, and suppression in the context of recent experimental work with animals and humans.

PSYC 735. Assessment and Intervention for Severe Behavior. 3 Hours.

PR: PSYC 533. Research and clinical practice in functional behavior assessment, including indirect, descriptive assessment, and functional analysis, and behavior-analytic interventions for severe challenging behavior.

PSYC 736. Advanced Experimental Analysis of Behavior. 3 Hours.

(May be repeated for credit with consent.) PR: PSYC 531. Selected topics and research issues in the experimental analysis of behavior.

PSYC 737. Advanced Applied Behavior Analysis. 3 Hours.

(May be repeated for credit with consent.) PR: PSYC 533. Application of research and theory of behavior analysis to social problems; other selected topics.

PSYC 738. Behavior Analysis in Education. 3 Hours.

PR: PSYC 533 with a minimum grade of B-. Behavior-analytic strategies in educational contexts, including problems facing the educational system, curriculum-based measurement, individualized educational assessment, and instructional design.

PSYC 739. Verbal Behavior. 3 Hours.

PR: PSYC 531 or consent. Examination of current empirical and theoretical issues related to the functional analysis of verbal behavior.

PSYC 740. Practicum in Developmental Psychology. 1-6 Hours.

PR: Consent. Provides experience in a wide range of applied settings. Sites are chosen to accommodate exposure to the entire life-span from infancy through old age. Supervising responsibilities are determined by the instructor-in-charge in the agency.

PSYC 745. Seminar in Life-Span Development. 3 Hours.

(May be repeated for credit with consent.) Current issues in life-span development or selected periods of the life span.

PSYC 750. Clinical Internship. 1-15 Hours.

Intensive training in clinical assessment, diagnosis, consultation, and/or treatment skills that occur during an internship placement, typically at an off-campus training site.

PSYC 752. Family and Marital Therapy. 3 Hours.

Examines both theoretical and practical aspects of the assessment and treatment of family and marital difficulties.

PSYC 754. Clinical Psychopharmacology. 3 Hours.

Survey of the ways in which psychotropic drugs are used to treat behavioral and psychological disorders.

PSYC 755. Seminar in Clinical Supervision. 1 Hour.

(May be repeated for credit with consent.) Theoretical foundations and empirical research pertaining to clinical supervision, coupled with experiential training in conducting clinical supervision in applied settings.

PSYC 762. Seminar in Clinical Psychology. 3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762B. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762D. Seminar in Clinical Psychology. 1 Hour.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762G. Seminar in Clinical Psychology. 3 Hours.

(May be repeated for credit with consent.) Research and problems in clinical psychology.

PSYC 762I. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762J. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762K. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762L. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762M. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762N. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762O. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762P. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Q. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762R. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762S. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762T. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762U. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762V. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762W. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762X. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Y. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 762Z. Seminar in Clinical Psychology. 1-3 Hours.

(May be repeated for credit with consent) Research and problems in clinical psychology.

PSYC 763. Cultural Competency in Clinical Psychology. 3 Hours.

PR: PhD student in Clinical Psychology or instructor permission. Advanced course on theory and research in multicultural psychology. Addresses historical, sociopolitical, and economic factors that contribute to human behavior. Topics include psychological processes and impact of bias, discrimination, racism, and privilege, and building cultural competencies related to awareness, sensitivity, and tolerance in working with diverse individuals. Contemporary and classic research supportive of these theories and processes are reviewed.

PSYC 772. Seminar in Clinical Child Psychology. 1 Hour.

(May be repeated for credit with consent.) Current issues and research related to a particular area of clinical psychology involving children.

PSYC 780. Advanced Integrative Seminar. 3 Hours.

Examination of the integration of two of the following areas of knowledge in scientific psychology: affective, biological, cognitive, developmental, or social aspects of behavior. (May be repeated for credit with consent.).

PSYC 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of psychology. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be P/F.).

PSYC 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

PSYC 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PSYC 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PSYC 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

PUBLIC ADMINISTRATION (PUBA)

PUBA 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBA 600. Democratic Context of Public Administration. 3 Hours.

Orientation to the field of public administration and its role in democratic governance in the United States. Review of the historical, philosophical, Constitutional, and intellectual foundations of administrative theory and public service values, with application to current trends and issues.

PUBA 610. Public and Nonprofit Management. 3 Hours.

Introduction to public and nonprofit management, including assessing organizational contexts, structures, and systems. Explores diverse strategies for managing programs, projects, people, and resources in public service organizations.

PUBA 620. Public and Nonprofit Financial Management. 3 Hours.

Graduate level introduction to the principles, practices, participants, and policies involved in public and nonprofit financial management, including fiscal resource management, financial reporting, and performance analysis.

PUBA 630. Public Service Research. 3 Hours.

Foundations and processes of applied research to inform public and nonprofit organizations, with an emphasis on research design, data collection and analysis, and presentation of findings and recommendations.

PUBA 645. Public Policy and Administration. 3 Hours.

Examines the administrative role throughout the democratic public policy process, focusing on ethical implications and associated technical skills.

PUBA 646. Public Policy Advocacy. 3 Hours.

This course examines the roles that advocacy plays in shaping public policy. Readings, class discussions, and applied project with stakeholders will connect the theoretical underpinnings of public policy advocacy to the public and private practices that can be used to mobilize policy change and legislative action.

PUBA 650. Local Governance. 3 Hours.

Introduction to the institutions and processes of local governance. Institutions include: government structures (county, municipal, special districts), volunteer boards and commissions, and various types of community-based organizations.

PUBA 651. Social Equity in Public Service. 3 Hours.

Explores the meaning, contributing factors, and challenges associated with social equity in public service organizations, processes, and outcomes. Examines application to different socioeconomic contexts.

PUBA 655. Public Engagement. 3 Hours.

Explores theories of community engagement. Develops skills in techniques for engaging citizens and other stakeholders in collaborative local governance and community building efforts.

PUBA 670. Health Systems. 3 Hours.

Graduate-level introduction to the development, structure, and current issues in the healthcare in the United States including health promotion, disease prevention, epidemiology, delivery and utilization of health services, financing, policy, regulation, and ethical concerns.

PUBA 671. Healthcare Organization and Operation. 3 Hours.

PR: PUBA 670 or PR or CONC:CHPR 635. Examines the organization and management of health-care settings including system influences, leadership, communication, organization behavior, team development, organization design, evaluation, productivity, performance improvement.

PUBA 672. Healthcare Finance. 3 Hours.

PR or CONC: PUBA 670 or CHPR 635. Examines financing of health-care, financial management concepts, insurance mechanisms, reimbursement, cost accounting, budgeting, and staffing for healthcare organizations, including integrated networks and managed care. The course focuses on concepts needed by first line and mid-level managers.

PUBA 691. Advanced Topics. 1-6 Hours.

Investigation of advanced topics not covered in regularly scheduled courses.

PUBA 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PUBA 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

PUBA 700. Capstone Seminar. 3 Hours.

PR: All PUBA 600 level and PUBA 751 or concurrent. Links MPA academic preparation to professional career through analysis of practice settings, professional literature, and internship/professional experience of student; integrates coursework, practice themes, competencies, and ethics.

PUBA 710. Public Service Leadership. 3 Hours.

Prepares students to exercise leadership in public and nonprofit organizations in response to changing social, economic, and environmental challenges. Examines various approaches to leadership and innovation, including strategic, communicative, and reflective practice.

PUBA 712. Administrative Ethics. 3 Hours.

Exploration of the foundations of ethical principles and practices in the public and nonprofit sectors. Application of principles through analysis of ethical dilemmas in serving the public.

PUBA 715. Organizational Development and Change Management. 3 Hours.

Examines organization development and change management applied to public agencies. Explores basic organization development skills, and techniques for effective change management.

PUBA 720. Public and Nonprofit Budgeting. 3 Hours.

PR: PUBA 620. Graduate level study of public budgeting principles and political processes in government and nonprofit organizations. Emphasis is placed on understanding revenue sources and tax structures, while developing the skills to craft, analyze, and revise budgets and performance measures.

PUBA 730. Advanced Public Service Research. 3 Hours.

PR: Consent. Methodological foundations, methods, and research design for public policy analysis and evaluation or program assessment and evaluation.

PUBA 741. Human Resources Systems. 3 Hours.

PR: Consent. Examines competing values, systems, processes, and methods for managing human resources in government and non-profit organizations; including merit, patronage, professional, collective bargaining, and entrepreneurial models.

PUBA 750. Public Planning. 3 Hours.

Examine the substantive range of public planning arenas. Principles and practices of organizational, program, project, or physical planning with consideration of the political and economic context.

PUBA 751. Public Service Internship. 1-6 Hours.

PR: Consent. A working internship in a government or public service related agency, designed to provide students with an opportunity to gain field experience, and to relate knowledge gained through course work situation. (Grading will be S/U.).

PUBA 755. Sustainable Community Development. 3 Hours.

PR: PUBA 750. Explores the theory, principles, and ethics of economic, environmental, and social sustainability as applied to community and economic development activities, with a focus on project and program implementation.

PUBA 780. Healthcare Administration Practicum. 3 Hours.

Students will develop and execute a field experience or scholarly research project that applies and integrates knowledge gained during healthcare administration course work into a functional capstone experience.

PUBA 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of public administration. NOTE: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for student not on assistantships to gain teaching experience.

PUBA 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

PUBA 792. Directed Study. 1-6 Hours.

Directed study, reading and/or research.

PUBA 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

PUBA 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

PUBA 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

PUBA 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RELIGIOUS STUDIES (RELG)

RELG 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of religion. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

RELG 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

RELG 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

RELG 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

RELG 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

RELG 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

RELG 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

RELG 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

RELG 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is S/U; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SOCIAL WORK (SOWK)**SOWK 513. Research Methods. 3 Hours.**

PR: Graduate standing in SOWK. Introduction to social work research methods, with the unifying theme of the importance of evidence-based practice. Content prepares students to develop, use, and communicate empirically based knowledge effectively. Research knowledge is used to provide high-quality services; initiate change to improve practice, policy and social service delivery; and evaluate practice at all levels.

SOWK 520. Human Behavior in the Social Environment. 3 Hours.

PR: Graduate standing in SOWK. Theories underlying human behavior within the social environment, including human development as well as behavior within families, groups, organizations, and communities. Special attention is given to issues of human diversity and the challenges and opportunities offered by rural environments.

SOWK 530. Professional Identity and Social Justice. 3 Hours.

PR: Graduate standing in SOWK. Provides the basic framework for generalist social work practice, theory, and professional values. Examines social work practice from an empowerment, human rights and social justice perspective. Addresses contemporary issues in social work reflecting the unique needs of diverse populations, settings and social conditions.

SOWK 531. Social Welfare Policy and Programs. 3 Hours.

PR: Graduate standing in SOWK. Development of foundational understanding and appraisal of social welfare policies and programs in the United States, and of the historical and contemporary forces that shaped their development. Introduces conceptual approaches to policy analysis and assesses selected social policies, programs regarding income maintenance, health care and social services with emphasis on impact in rural areas.

SOWK 540. Generalist Practice 1: Individuals, Families, and Groups. 3 Hours.

PR: Graduate standing in SOWK. Development of a generalist framework for social work practice at the micro and mezzo levels. Reinforcement of engagement, assessment, and intervention skills with attention to strengths-based perspective and multi-culturally competent social work practice. Focus on developing theoretical knowledge as well as practicing and applying specific techniques necessary for generalist social work practice.

SOWK 541. Generalist Practice 2: Rural Community Macro Practice. 3 Hours.

PR: Graduate standing in SOWK. Students learn to identify and understand social problems in rural communities. Development of knowledge and skills in community and organizational practice to assist rural communities effectively, to enhance their empowerment through acquisition and mobilization of resources.

SOWK 581. Generalist Field Experience. 3-6 Hours.

PR or CONC: SOWK 530 and SOWK 540 and graduate standing in Social Work. Community-based generalist field placement and an integrative seminar. Students learn to apply generalist engagement, assessment, intervention, and evaluation skills. Students also acquire an understanding of responding to social and human problems within the context of social work values and ethics, social justice, and affirmation of the human rights of diverse groups of people.

SOWK 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOWK 616. Evaluation Research in Social Work. 3 Hours.

PR or CONC: SOWK 682 and graduate standing in Social Work. Prepares students to evaluate social work practice and health and human services programs. Students learn to design an evaluation study, collecting qualitative and quantitative data, and to report and interpret results while adhering to ethical research standards.

SOWK 626. Child Mental Health: Promotion, Prevention, and Treatment. 3 Hours.

PR: Graduate standing in SOWK. Examines the structure of the United States' public mental health system for children and related policy issues. Analysis of mental-health construct across a prevention-treatment continuum. Students learn to distinguish universal, selected, and indicated prevention from treatment. Risk and protective factors, evidence-based prevention and treatment interventions are evaluated throughout the course.

SOWK 627. Clinical Practice in Integrated Healthcare. 3 Hours.

PR: Graduate standing in SOWK. Prepares students to address challenges of integrating services for persons with health, mental health and substance use problems. Addresses language and culture of health, theories and models for integrated health care. Examines role of behavioral health providers in primary care settings. Examines multidisciplinary team practice and best practices for assessment and intervention.

SOWK 633. Social Policy Analysis, Advocacy, and Deliberation. 3 Hours.

PR: Graduate standing in SOWK and students must have completed SOWK 531 or have Advanced Standing status. Focus is on contribution of social work and social welfare to the human condition and communities. Analyzes ideologies and values, and their impact on policy and social work practice. Students analyze social problems and issues, and reach conclusions about strategies to empower clients.

SOWK 643. Assessment and Diagnosis. 3 Hours.

PR: Graduate standing in SOWK and students must have completed all 500-level courses in the MSW degree plan or have Advanced Standing status. Analyzes mental illness assessment and diagnosis from a social work perspective. Examines the impact of major mental illnesses on diverse client populations across the life cycle and multi-level systems. Assessment, diagnostic, and intervention strategies are provided for advancing social work methods of assessment and diagnosis within integrated practice settings.

SOWK 649. Practice with Individuals. 3 Hours.

PR: Graduate standing in SOWK and students must have completed all 500-level courses in the MSW degree plan or have Advanced Standing status. Focus on social work theories and methods consistent with integrated practice with individuals. Emphasis on evidence-based theories and methods relevant to integrated practice in contemporary settings. Advanced integrated practice addressed within a context of professional social work values and ethics, social justice, and affirmation of the human rights of diverse groups of people.

SOWK 650. Practice with Families and Groups. 3 Hours.

PR: Graduate standing in SOWK and students must have completed all 500-level courses in the MSW degree plan or have Advanced Standing status. Exploration of advanced integrated social work practice with families and groups. Emphasis on group work and family intervention relevant to integrated practice in contemporary settings, the context of professional social work values and ethics, social justice, and affirmation of the human rights of diverse groups of people.

SOWK 654. Organizational Administration and Leadership. 3 Hours.

PR: Graduate standing in SOWK. Examination of concepts, principles, and skills of social agency and program administration from an integrated practice perspective. Includes programming, budgeting, staffing, organization, and management of social agencies and programs. Addresses relationships with constituents and other human service organizations and systems within a context of professional social work values and ethics, social justice, and human rights.

SOWK 656. Financial Management and Grant Writing. 3 Hours.

PR: Graduate standing in SOWK. Focus is on grant development and financial management in nonprofit settings from an integrated practice perspective. Topics include grant seeking, proposal development, budgeting, and nonprofit management within the context of professional social work values and ethics, social justice, and affirmation of the human rights of diverse groups of people.

SOWK 675. Addiction and Social Work Practice. 3 Hours.

PR: Graduate standing in SOWK. Examination of theoretical and neuro-biological perspectives on addiction from an integrated practice perspective. Study of evidence-based intervention strategies used for engagement, assessment, and treatment of individuals who have substance use disorders. Discussion of impact of substance-use disorders and addiction on families and society. Review of substance use-related social policies.

SOWK 680. Child Welfare Continuum. 3 Hours.

PR: Graduate standing in SOWK. Theories and methods of integrated practice related to child welfare, including child welfare policy and services, family preservation/home-based services, adoption, foster, and residential care. Also includes community-based practices and intervention in the context of professional social work values and ethics, social justice and affirmation of human rights.

SOWK 682. Advanced Field Experience. 3-5 Hours.

PR: Graduate standing in SOWK and students must have successfully completed SOWK 582 or have Advanced Standing status and students are expected to take all sections of SOWK 682 in sequence as denoted on their degree plans. Community-based advanced field placement and integrative seminar. Students learn to apply advanced integrated practice skills. They engage with interdisciplinary teams to address social and human problems within a context of social work values and ethics, social justice, and affirmation of the human rights of diverse groups of people.

SOWK 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching.

SOWK 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SOWK 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SOWK 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SOWK 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOWK 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SOWK 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SOWK 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SOWK 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SOWK 731. Philosophy and Theories of Social Sciences. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course provides an overview of the history and evolution of social science philosophy and theories. This overview serves as a contextual base to examine the history and development of the social work profession and underlying foundation of contemporary social work practice.

SOWK 732. Advanced Social Work Practice Theories. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course expands on content covered in Philosophy and Theories of Social Sciences by focusing on classic and contemporary social work practice theories. Students will examine key theories in their area of research interest and begin the development of a theoretical foundation for their own work.

SOWK 735. Advanced Social Work Research Methods. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course provides essential skills for independent research. Students learn advanced skills related to hypothesis formulation, operationalization of variables and measurement, issues of validity and reliability, data collection methods, sampling, and quantitative research designs. Students apply research concepts to their own substantive interest area. Examination of research methods is grounded in the context of social work values and ethics.

SOWK 736. Community Focused Research. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course expands on topics taught in Advanced Social Work Research Methods and examines qualitative, mixed methods, and program evaluation research designs commonly utilized in community focused research. The challenges and strategies of data collection and analysis across designs are addressed, with particular focus on ethics and community engagement strategies.

SOWK 741. Statistics & Data Analysis 1. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course begins a two-semester sequence in statistics. This first course provides an introduction to the fundamentals of quantitative reasoning, probabilistic analysis, and statistical inference as applied in social science research. Students will develop a conceptual framework for approaching quantitative problems and build a strong foundation for understanding increasingly complex methods and applications in the second semester.

SOWK 742. Statistics & Data Analysis 2. 3 Hours.

PR: PhD student in Social Work or instructor permission and preceded by Statistics & Data Analysis 1 or instructor permission. This course is the second in the statistics and data analysis sequence. The course focuses on regression topics and other methods based on the linear model. There will be a special emphasis on issues that arise in data analysis, model building, and interpretation of empirical results. Advanced techniques on specific topical areas will be discussed.

SOWK 750. Advanced Social Policy and Programs. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course assists students in developing an advanced understanding of social policy and programs and provides opportunity to analyze policies at all levels as related to their research area of focus. Special emphasis is placed on issues related to organizational leadership and implementation science in health and human service organizations.

SOWK 761. Research Practicum 1. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course prepares students for the initial stages of independent research with a focus on problem definition, hypothesis formulation, literature review, and application of theoretical perspectives appropriate to the research question. Content related to external funding and grant pathways related to students' areas of research are also addressed.

SOWK 762. Research Practicum 2. 3 Hours.

PR: PhD student in Social Work or instructor permission and preceded by Research Practicum 1 or instructor permission. This course prepares students for independent research with a focus on design and measurement. Students develop an advanced conceptual understanding of skills used in research design and measurement, with emphasis on community focused research. The Institutional Review Board (IRB) review process as it applies to students' substantive areas is also addressed.

SOWK 770. Issues in Social Work Education. 3 Hours.

PR: PhD student in Social Work or instructor permission. This course examines the history and current philosophy of social work education within the context of higher education. Topics include higher education as a setting for social work education programs, career advancement in the academy, significant developments in the evolution of social work education, accreditation and curricula design, and current issues in social work education.

SOWK 780. Integrative Research Seminar. 3 Hours.

PR: PhD student in Social Work or instructor permission and preceded by all other PhD coursework in Social Work or instructor permission. This seminar provides students with faculty and peer feedback in the development of their comprehensive exam in the form of a dissertation proposal. Emphasis is placed on conceptual and methodological congruency of the proposed research. A plan for manuscript writing based on the 3-article dissertation format is developed. Professional development as an academic researcher and/or organizational leader is also addressed.

SOWK 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, scholarly project, or a dissertation. Grading is S/U.

SOCIOLOGY (SOC)**SOC 522. Contemporary Sociological Theory. 3 Hours.**

Review of recent trends and orientations in sociology. Theory construction, topologies, models, and the relationship between theory and research. Review of current literature.

SOC 600. Becoming a Sociologist. 1 Hour.

The purpose of this seminar is to socialize students into the discipline and profession of sociology. Training to become a professional sociologist includes learning information on (a) policies and procedures, (b) the importance and means of presentation of self, and (c) information on research, teaching and service. Students are required to take this course during their first semester.

SOC 615. Sociological Data Analysis and Interpretation 1. 3 Hours.

Univariate, bivariate, and multivariate analyses of social science data. Topics include descriptive statistics, elementary statistical inference, and linear regression. The use of statistical software to conduct data analysis is also explored.

SOC 616. Sociological Data Analysis and Interpretation 2. 3 Hours.

PR: SOC 615. Advanced regression-based analysis of social science data. Topics include nonlinear regression, mediation and path analysis, methods for analyzing panel data, and techniques for examining categorical dependent variables. The use of statistical software is also explored.

SOC 620. Sociological Research Methods. 3 Hours.

Focuses on the logic of framing and designing social research: Philosophical foundations, connections between theory and methods, narrowing research questions, and making design and data collection decisions. Emphasis on reading and critiquing published studies.

SOC 632. Introduction to Qualitative Data Analysis Software. 3 Hours.

This course examines the basic functions of computer assisted qualitative data analysis software and shows how it can be used to analyze a variety of types of qualitative data. Topics covered include how to open, import, and manage qualitative data, how to code/recode the data, summarize and report it, and perform a wide variety of procedures.

SOC 640. Quantitative Analysis Using Stata. 3 Hours.

Interpretation and application of social scientific quantitative data analysis concepts and techniques using Stata. Examination of the basic functions of Stata and shows how it can be used to analyze quantitative datasets. Topics covered include descriptive and inferential statistics, how to manage datasets in Stata, and how to perform a wide variety of statistical procedures using Stata.

SOC 689. Field Work. 1-6 Hours.

PR: Departmental consent. Supervised field work.

SOC 693. Special Topics. 1-6 Hours.

PR: Consent. Study of advanced topics that are not covered in regularly scheduled courses.

SOC 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOC 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, scholarly project, or a dissertation. Grading is S/U.

SOC 698. Thesis. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SOC 700. Navigating the Job Market. 1 Hour.

This course is designed to help students successfully navigate the job market. There are four main topic areas covered in this course. These include 1) getting started, 2) the interview process, 3) getting the job, and 4) surviving the first year as a faculty member. Students will take this class in the same semester they defend their dissertation proposal.

SOC 710. Teaching Sociology. 3 Hours.

Students will engage in the literature on teaching and learning, exploring the major issues involved in teaching sociology at the university level. Each student will work with an instructor in the activities that constitute the teaching enterprise in an "apprenticeship" role for the semester. Students are expected to develop a course plan by the end of the semester.

SOC 711. Writing in Quantitative Methods. 3 Hours.

PR: SOC 615 and SOC 616. This course provides students with the resources to write a polished quantitative paper that is suitable for submission to a peer-reviewed journal. The students will revise the paper they have completed as part of the requirements for SOCA 615/616, a research paper from a substantive course, or a paper that is part of a research or grant project.

SOC 715. Advanced Statistical Methods for Sociology. 3 Hours.

PR: SOC 615 and SOC 616. Course covers statistical methods beyond basic descriptive and inferential analysis. Topics may include categorical analysis, structural equation modeling and/or hierarchical linear models. The use of statistical software is also discussed.

SOC 720. Sociological Survey Methods. 3 Hours.

Provides students with tools to evaluate and design survey research projects critically in sociology. Key topics include relationships among sampling, questionnaire construction, and mode choice. Course designed around types of error in surveys and ways to minimize.

SOC 721. Qualitative Methods. 3 Hours.

Provides students with tools to evaluate and design qualitative research projects critically. Focuses on philosophical foundations and researcher/subject roles, considerations associated with data collection, and data analysis methods.

SOC 722. Mixed Methodology for the Social Sciences. 3 Hours.

Focus is on designing and conducting a mixed methods research study including how to identify appropriate research questions and answering them by combining quantitative and qualitative methods approaches.

SOC 724. Structural Equation Modeling for the Social Sciences. 3 Hours.

PR: SOC 640. Focus on how to specify, estimate, and test structural equation models. Topics include path analysis, confirmatory factor analysis and linear models with latent variables. Emphasizes applications to substantive problems in the social sciences.

SOC 725. Introduction to Evaluation Research Methods. 3 Hours.

PR: SOC 620. This course serves as an introduction to evaluation methodology and to the evaluation tools commonly used to assess effectiveness of a wide variety of programs and policies.

SOC 726. Ethnographic Investigation. 3 Hours.

Training in theories and practical application of ethnographic methods. Focus is on understanding the types of questions best answered by ethnographic investigations, why such methods are appropriate, and hands-on training in various styles of ethnography. Students will perform original ethnographic research using the concepts and tools gained.

SOC 727. Demographic Research Methods. 3 Hours.

PR: SOC 620. This course will comprise an overview of demographic data and methods commonly used by professionals in public health practice and research. The course is a graduate level seminar.

SOC 728. Content Analysis. 3 Hours.

Advanced introduction to the analysis of textual content for social insight; surveys classic approaches and recent advances in quantitative and qualitative content analysis; students design and execute projects that analyze textual data for social inference.

SOC 729. Experimental Design and Analysis for Sociology. 3 Hours.

PR: SOC 615 and SOC 616. How to design, carry out, and analyze experiments. Various designs are discussed and their respective differences, advantages, and disadvantages are noted. The use of statistical software to conduct analysis is also explored.

SOC 730. Sociological Explanation. 3 Hours.

Addresses the development and application of sociological theory to empirical research questions. Includes the logic of theory, strategies and steps in constructing theories, and strengths and limitations of theories.

SOC 740. Theories of Crime and Deviance. 3 Hours.

PR: SOC 610. Graduate-level foundation of theory and new empirical research in sociological criminology. Focus is definitive statements from important theoretical traditions and critical empirical tests of these theories. Critiques of the theories or the research generated by them and attempts to translate theories into policy and action.

SOC 750. Systemic Inequalities. 3 Hours.

Examines inequalities that are built into societies' legal, social, and economic structures, with an emphasis on intersecting processes and experiences of inequality. Focuses on analysis of classical and contemporary theories and research and applications to contemporary debates about inequality. These center on a variety of social spheres such as education, housing, labor markets, and the criminal justice system.

SOC 760. Space, Place, and Community. 3 Hours.

PR: SOC 610. Sociological based ideas about space, place and community, discussing the theoretical contributions in these areas, assessing the methodological contributions to the discipline and linking them all to sub-areas within community, including urban, rural, medical and environmental sociology.

SOC 770. Sociology of Religion. 3 Hours.

This course examines factors that lead to conversion, apostasy, and religious commitment and explores what makes certain religious traditions more effective at gaining and retaining members. Focuses on analysis of classical and contemporary sociological theories of religion that provide a framework for understanding past, present, and future religious phenomena, including the role of religion in society.

SOC 780. Individual and Society. 3 Hours.

PR: SOC 610. Examines micro and macro-linkages and uncovers relationships between society and the perceptions, beliefs, and behaviors of individuals.

SOC 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of sociology.

SOC 793. Special Topics. 1-6 Hours.

PR: Consent. Investigation of topics not covered in regularly scheduled courses.

SOC 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SOC 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U.).

SOC 798. Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SPANISH (SPAN)

SPAN 521. Dialectology and Sociolinguistics. 3 Hours.

This course covers the variation of the Spanish language from geographical and social perspectives. Students will learn about variation at multiple levels of the grammar including its phonology, morphology, lexicon and syntax. The first part of the course will concentrate on the diatopic variation while the second part will look at the role of external forces and socially induced changes.

SPAN 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Spanish. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SPAN 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SPAN 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPAN 594. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SPAN 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPAN 610. Methods of Research. 3 Hours.

Fundamentals of literary and cultural research, writing and publishing, both in form and content. Topics include: selection and definition of a corpus of study; formulation and articulation of a research hypothesis; research and evaluation of secondary sources; formats for literary/cultural research projects; online research engines; alternative secondary sources; professional conference presentations; and academic article submissions.

SPAN 611. Literary Criticism. 3 Hours.

Introduction to the main tendencies of contemporary literary theory as applied to Spanish literature; literary theory and practice. Review and evaluation of the main critical approaches from a practical standpoint.

SPAN 630. Latin American Culture. 3 Hours.

A study of history, culture, politics, economics, and development of the Latin American continent.

SPAN 631. Latin American Short Story. 3 Hours.

SPAN 633. Latin American Novel Since 1960. 3 Hours.

SPAN 637. Early Spanish-American Literature. 3 Hours.

In depth readings in Spanish-American literature of the colonial period in their historical context.

SPAN 638. Mexican Literature. 3 Hours.

In-depth readings of literary works from Mexico.

SPAN 639. Gaucho Culture and Literature. 3 Hours.

In-depth study of the culture and literature of the Gaucho in the historical and political context of Argentina and Uruguay. Taught in Spanish.

SPAN 640. 19th Century Latin American Literature. 3 Hours.

In-depth study of the main literary works and movements in Latin America from Neoclassicism to Modernism. Taught in Spanish.

SPAN 641. 20th- and 21st-Century Latin American Literature. 3 Hours.

In-depth study of the main literary works and movements in Latin America from early 20th century to the present. Taught in Spanish.

SPAN 643. Contemporary Spanish Literature. 3 Hours.

Introduction to the major tendencies, authors, and works of Spanish Peninsular Literature from the late 19th Century to nowadays; presentation and analysis of the main literary movements of the period.

SPAN 651. Medieval and Golden Age. 3 Hours.

In-depth reading in Spanish literature of the Middle Ages Renaissance, and Baroque periods, in narrative, drama, and poetry, within its historical context. Non-canonical works will also be included and studied.

SPAN 652. Cervantes. 3 Hours.

PR: 24 hours of Spanish or consent.

SPAN 653. Eighteenth and Nineteenth Century Literature. 3 Hours.

Introduction to the major tendencies, authors, and works of the 18th and 19th Centuries Spanish Peninsular Literature; presentation and analysis of the main literary movements of the period, from the Enlightenment to Naturalism.

SPAN 654. Spanish Literature 1898-1936. 3 Hours.

Survey of the major trends and representative authors and works of the Modernist period in Spain.

SPAN 655. Spanish Literature 1936-1975. 3 Hours.

In-depth study of Spanish literature published between 1936, the outbreak of the Spanish Civil War, and 1975, the end of the Franco dictatorship. Focus on all genres and their historical context.

SPAN 656. Spanish Literature after 1975. 3 Hours.

Survey of the major trends and representative authors and works of Spanish literature since the end of the Franco dictatorship.

SPAN 672. Spanish Women Writers. 3 Hours.**SPAN 673. Hispanic Literature and Film. 3 Hours.****SPAN 674. Afrohispanic Literature. 3 Hours.**

The reading, discussion, and analysis of literature written by Hispanic authors of African descent.

SPAN 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of Spanish. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading will be P/F.).

SPAN 691. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

SPAN 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

SPAN 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

SPAN 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

SPAN 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

SPAN 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper, or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

SPAN 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

SPAN 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement of registration in the semester in which graduation occurs.

SPAN 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

SPAN 930. Professional Development. 1-6 Hours.

Professional development courses provide skill renewal or enhancement in a professional field or content area (e.g. education, community health, geology). These tuition waived continuing education courses are graded on a pass/fail grading scale and do not apply as graduate credit toward a degree program.

STATISTICS (STAT)

STAT 511. Statistical Methods 1. 3 Hours.

Descriptive numerical and graphical univariate and bivariate statistics; probability and random variables including normal, t, F, and chi-square distributions; one- and two-sample tests of hypotheses and confidence intervals; simple linear regression and correlation; one-way analysis of variance with multiple comparisons protection; and contingency table chi-square tests. (Equivalent to EDP 613 and PSYC 511.).

STAT 512. Statistical Methods 2. 3 Hours.

PR: STAT 511. Methods for analyzing data primarily with a continuous response variable collected from a completely random, randomized complete block, or factorial experimental design with or without subsampling. Unplanned and planned multiple and orthogonal comparisons for qualitative and quantitative treatments and factorial arrangements. Experimental data versus observational studies. Simple and multiple linear regression analysis. (Equivalent to EDP 614 and PSYC 512.).

STAT 513. Design of Experiments. 3 Hours.

PR: STAT 512. Fixed, random, and mixed linear models for analyzing data from designed experiments including the complete and fractional factorial experiment, and the completely random, randomized complete block, balanced incomplete block, Latin square, central composite, nested, and split-plot experimental designs. Expected mean squares and power of tests. Use of blocking and confounding to increase design testing power and efficiency.

STAT 516. Forensic Statistics. 3 Hours.

PR: STAT 215 or equivalent. Probabilistic and statistical evaluation of evidence in forensic science: concepts of uncertainty variation, discriminating power, coincidence/significance probabilities, historical overview, transfer evidence, DNA profiling, fingerprint identification, biometric identification, and case studies.

STAT 521. Statistical Analysis System Programming. 3 Hours.

PR: STAT 511 or equivalent. Topics in Statistical Analysis System (SAS). Students perform statistical data analyses, data modifications and manipulations, file operations, and statistical report writing. Prepares students for the SAS Base Programming certification exam.

STAT 522. Advanced Statistical Analysis System Programming. 3 Hours.

PR: STAT 521 or consent. Advanced topics in Statistical Analysis System (SAS); SAS SQL to generate reports, join tables, construct queries; SAS Macrolanguage basics; write/implement SAS macro programs. Prepares students for SAS Advanced Programmer Certification Exam.

STAT 523. Statistical Computing. 3 Hours.

PR: STAT 512. Monte Carlo methods; randomization, partitioning, and the bootstrap; identifying data structures, estimating functions, including density functions; statistical models of dependencies. R programming.

STAT 531. Sampling Theory and Methods. 3 Hours.

PR: STAT 511 or consent. Survey components, methods of sampling for finite and infinite populations, single and multi-stage procedures, confidence limits for estimating population parameters, sample size determination, area sampling sources of survey error, and basic inference derived from survey design.

STAT 541. Applied Multivariate Analysis. 3 Hours.

PR: STAT 511 or equivalent. Introduction to Euclidean geometry and matrix algebra; multiple and multivariate regression including multiple and canonical correlation; the k-sample problem including discriminant and canonical analysis; and structuring data by factor analysis, cluster analysis, and multi-dimensional scaling.

STAT 543. Bioinformatics Data Analysis. 3 Hours.

PR: STAT 512 or equivalent. Statistical analyses of high-throughput experiments using data visualization, clustering, multiple testing, classification and other unsupervised and supervised learning methods. Data processing, including background adjustment and normalization. Case studies.

STAT 545. Applied Regression Analysis. 3 Hours.

PR: STAT 512. Matrix approach to linear and multiple regression, selecting the best regression equation, model building, and the linear model approach to analysis of variance. Use of diagnostic measures to assess and improve model adequacy leading to practical model-based inferences or predictions.

STAT 547. Survival Analysis. 3 Hours.

PR: STAT 512. Survival model methodology, including model selection for incomplete data with censored, truncated, and interval censored observations. Applications to many real life problems using R.

STAT 551. Nonparametric Statistics. 3 Hours.

PR: STAT 511 or equivalent. Distribution-free procedures of statistical inference. Location and scale tests for homogeneity with two or more samples (related or independent); tests against general alternatives.

STAT 555. Categorical Data Analysis. 3 Hours.

PR: STAT 512 or equivalent. Bivariate association for ordinal and nominal variables, models for categorical or continuous responses as a special case of generalized linear models, methods for repeated measurement data, exact small-sample procedures.

STAT 561. Theory of Probability and Statistics 1. 3 Hours.

Probability and random variables, univariate and multivariate distributions, expectations, generating functions, marginal and conditional distributions, independence, correlation, functions of random variables, including order statistics, limiting distributions, and stochastic convergence.

STAT 562. Theory of Probability and Statistics 2. 3 Hours.

PR: STAT 561. Bayesian and frequentist techniques of point and interval estimation. Properties of estimators including bias, consistency, efficiency, and sufficiency. Hypothesis testing including the Neyman-Pearson Lemma and likelihood ratio tests. Regression, correlation, and nonparametric statistical procedures.

STAT 582. Statistical Consulting. 1 Hour.

PR: STAT 513 or Consent. Statistical consulting principles and procedures. The entire consulting experience, including design, models, communication skills, ethics, tracking, and documentation, is presented in a series of case studies, including student presentations and reports on assigned cases.

STAT 590. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of statistics. Note: This courses is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

STAT 591. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation in advanced topics not covered in regularly scheduled courses.

STAT 593. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

STAT 595. Independent Study. 1-9 Hours.

STAT 595. Independent Study. 1-6 HR. Faculty supervised study of topics not available through regular course offerings.

STAT 623. Data Technologies. 3 Hours.

PR: STAT 512 or consent. R data manipulation and processing. Topics include: R operators, functions, data structures, and objects; R data input and output, package development, and text processing; R interfaces to XML and SQL databases.

STAT 624. High Performance Analytics. 3 Hours.

PR: STAT 623. High performance and data-stream computing using R. Topics include: parallel R packages; Hadoop clusters; MapReduce R scripting; shared R network spaces; beyond-memory data analysis; data-stream modeling and visualization.

STAT 645. Linear Models. 3 Hours.

PR: STAT 545 and (STAT 462 or STAT 562) or consent. Multivariate normal distribution, distribution of quadratic forms, linear models, general linear hypotheses, experimental design models, components of variance for random effects models.

STAT 682. Statistics Practicum. 1 Hour.

PR: STAT 582. Statistical consulting on university-related research projects under the direction of a statistics faculty member.

STAT 689. Professional Field Experience. 1-6 Hours.

PR: Consent. (May be repeated up to a maximum of 18 hours). Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

STAT 690. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of statistics. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It also provides a mechanism for students not on assistantships to gain teaching experience. (Grading may be S/U.).

STAT 691. Advanced Topics. 6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

STAT 692. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

STAT 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

STAT 694. Seminar. 1-6 Hours.

Special seminars arranged for advanced graduate students.

STAT 695. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

STAT 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

STAT 697. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).

STAT 698. Thesis or Dissertation. 1-6 Hours.

PR: Consent. This is an optional course for programs that wish to provide formal supervision during the writing of student reports (698), or dissertations (798). Grading is normal.

STAT 699. Graduate Colloquium. 1-6 Hours.

PR: Consent. For graduate students not seeking coursework credit but who wish to meet residency requirements, use of the University's facilities, and participate in its academic and cultural programs. Note: Graduate students who are not actively involved in coursework or research are entitled, through enrollment in their department's 699/799 Graduate Colloquium to consult with graduate faculty, participate in both formal and informal academic activities sponsored by their program, and retain all of the rights and privileges of duly enrolled students. Grading is P/F; colloquium credit may not be counted against credit requirements for masters programs. Registration for one credit of 699/799 graduate colloquium satisfies the University requirement in the semester in which graduation occurs.

STAT 745. Data Mining. 3 Hours.

PR: STAT 545 or equivalent. Development of predictive models for large datasets, including logistic and linear models, regression and classification trees, and neural networks. Data preparation, including imputation and filtering.

STAT 761. Theoretical Statistics 1. 3 Hours.

PR: STAT 562 or consent. Advanced statistical theory including: consistent estimators; limiting distributions; asymptotic properties; goodness-of-fit tests; maximum likelihood estimation, moment generating functions; properties of statistical tests and procedures for finite-dimensional and infinite-dimensional spaces.

STAT 762. Theoretical Statistics 2. 3 Hours.

PR: STAT 761. Continuation of STAT 761 including: asymptotic optimality, contiguity of probability measures, local asymptotic normality of likelihood ratio test, Bayesian estimation, general linear models estimation and testing, and kernel smoothing methods in density and regression estimation.

STAT 763. Stochastic Processes. 3 Hours.

PR: STAT 561. Modeling of random phenomenon occurring over time, space, or time and space simultaneously. Modern techniques, such as the martingale decomposition, are applied to different statistical models.

STAT 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

STAT 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading will be S/U).

WOMEN AND GENDER STUDIES (WGST)**WGST 530. Feminist Theory. 3 Hours.**

Explores feminist theory through works of diverse scholars, focusing on questions of essentialism, difference, sexuality, bodies, language, power, economic and ecological justice; intersections of race, class, and gender, as well as global social justice struggles.

WGST 592. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

WGST 593. Special Topics. 1-6 Hours.

PR: Consent. A study of contemporary topics selected from recent developments in the field.

WGST 595. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

WGST 693. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WGST 696. Graduate Seminar. 1-3 Hours.

PR: Consent. Series of meetings that may include research presentations by students, faculty, or visitors; discussions of professional issues or current literature; or other varying topics.

WGST 790. Teaching Practicum. 1-3 Hours.

PR: Consent. Supervised practice in college teaching of women's studies. Note: This course is intended to insure that graduate assistants are adequately prepared and supervised when they are given college teaching responsibility. It will also present a mechanism for students not on assistantships to gain teaching experience. (Grading will be S/U.).

WGST 791. Advanced Topics. 1-6 Hours.

PR: Consent. Investigation of advanced topics not covered in regularly scheduled courses.

WGST 792. Directed Study. 1-6 Hours.

Directed study, reading, and/or research.

WGST 793. Special Topics. 1-6 Hours.

A study of contemporary topics selected from recent developments in the field.

WGST 795. Independent Study. 1-9 Hours.

Faculty supervised study of topics not available through regular course offerings.

WGST 796. Graduate Seminar. 1-3 Hours.

PR: Consent. Each graduate student will present at least one seminar to the assembled faculty and graduate student body of his or her program.

WGST 797. Research. 1-9 Hours.

PR: Consent. Research activities leading to thesis, problem report, research paper or equivalent scholarly project, or a dissertation. (Grading may be S/U.).