MALS 617 American Art in Context
- This course is designed to give the non-specialist in art history an understanding of how social, economic, religious, and cultural attitudes in America are reflected in its art, architecture, and decorative arts from the colonial period to the present. Discussion encompasses such subjects as patronage, regionalism, ethnicity, and gender.
- RESTRICTIONS: Open to majors only.

MALS 618 Studies in the History of Art
- Selected topics in the history of art. Focuses on art in the context of cultural and social history for an advanced audience of non-specialists.
- RESTRICTIONS: Open to majors only.

MALS 619 The Scientist in Society
- Scientific research is directly influenced by the society in which it is conducted. In addition to financial limitations, constraints are imposed by societal norms of what are acceptable topics and procedures for research. Focus on the philosophical basis of science as well as consequences to society of the scientific revolution.
- RESTRICTIONS: Open to majors only.

MALS 620 The Use of Science in Public Discourse
- Examines important questions of general interest to both individuals and to governmental bodies that depend heavily on scientific information.

MALS 621 The Impacts of European Contacts on Native Americans
- Considers how the arrival of the first Europeans in North America affected the indigenous Native Americans.

MALS 622 Interpreting the Past
- Considers the different perspectives that can be applied to learning about the past.

MALS 623 Mozart and Noverre
- Mozart's contributions to opera and how they compare favorably to Noverre's contributions to dance. Noverre's letters reveal his innovative ideas about dance while several of the final operatic masterpieces of Mozart are useful examples to study and understand his musical, sociological and philosophical environment.

MALS 647 Philosophy of Technology
- See PHIL647 for course description.

MALS 648 Environmental Ethics
- See PHIL648 for course description.

MALS 660 Humanities Colloquium

MALS 869 Master's Thesis
- 1-6

MALS 879 Synthesis Project
- 3-6

MATERIALS SCIENCE

MASC 302 Materials Science for Engineers
- Crystal binding and structure; energetics and structure of lattice defects; elasticity, plasticity, and fracture; phase equilibria and transformations; relations of family and treatment to properties; structures of inorganic and organic polymers; and electronic and magnetic properties.

MASC 366 Independent Study
- 1-6

MASC 406 Corrosion and Protection
- PREQ: Physical chemistry.

MASC 410 Experimental Mechanics of Composite Materials
- Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate strength and stiffness characteristics of composite materials. May be cross-listed with CIEG410.

MASC 446 Senior Research
- 1-6
- Student will research general areas of Materials Science and/or Engineering under the direction of a member of the Materials Science or other authority in science or engineering subject to the approval of the Materials Science Chair.
- RESTRICTIONS: Open to Seniors only. Science background required.

MASC 466 Independent Study
- 1-6

MASC 600 Introduction to Polymer Science and Engineering
- See CHIEG600 for course description.
MASC 601  Structure and Properties of Polymer Materials  3
Measurement and control of the microstructure and properties of solid polymers. Structure generation, structure-property models and effects of processing on properties. May be cross-listed with CHEG601.
PREREQ: MASC302

MASC 602  Structure of Materials  3
Crystal structure analysis by X-ray and electron diffraction. Characterization of materials by optical microscopy, scanning and transmission electron microscopy, thermal analysis and spectroscopy.
PREREQ: MASC302

MASC 603  Analytical Techniques in Materials Science  3
Laboratory course in optical microscopy. X-ray diffraction, scanning and transmission electron microscopy, electron diffraction. X-ray fluorescence and microanalysis. Auger analysis and other spectroscopic techniques.
PREREQ: MASC302 and MASC602.
COREQ: MASC602

MASC 604  Phase Transformations  3
PREREQ: MASC302

MASC 606  Corrosion and Protection  3
PREREQ: MASC302

MASC 607  Physical Properties of Materials I  3
Basic models of electrical, magnetic, optical and thermal properties of solid materials. Introduction to quantum physics to describe electronic structure of atoms, atomic bonds and crystals. Electronic, magnetic and optical effects in metals, semiconductors, ceramics, polymers and amorphous materials. Operation of basic electronic devices and semiconductors.
PREREQ: MASC302 and PHYS208

MASC 610  Experimental Mechanics of Composite Materials  3
Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate strength and stiffness characteristics of composite materials. May be cross-listed with CIEE610.
PREREQ: MASC302

MASC 614  Fracture of Materials  3
Fracture mechanics, micromechanisms, nucleation and propagation of cracks, fracture toughness, ductile/brittle transitions, fatigue, stress, corrosion, irradiation effects and nonmetallic materials. May be cross-listed with MEEG614.
PREREQ: MASC302

MASC 615  Mechanical Properties of Materials  3
RESTRICTIONS: Requires graduate status

MASC 616  Chemistry and Physics of Surfaces and Interfaces  3
See CHEG616 for course description

MASC 680  Equilibrium in Material Systems  3
PREREQ: MASC302

MASC 684  Kinetics in Material Systems  3
PREREQ: MASC302

MASC 687  Physical Properties of Materials II  3
Detailed theory of thermal, electrical, magnetic and optical properties of materials. Basic formalisms of quantum theory with applications to solid materials. Reciprocal space treatment of energy bands; phonon theory of lattice vibrations; scattering, absorption and emission of photons. Advanced materials and structures.
PREREQ: MASC607

MASC 617  Composite Materials  3
See MEEG817 for course description

MASC 821  Diffraction of Radiation by Matter  3
Theory and analysis of diffraction from ideal and imperfect crystals, gases and liquids, and other atomic aggregations.

MASC 823  Transmission Electron Microscopy in Materials Science  3

MASC 868  Research  1-9

MASC 869  Master’s Thesis  1-6

MASC 964  Pre-Candidacy Study  3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy

MASC 969  Doctoral Dissertation  1-12 PF

MARINE STUDIES

MAST 200  The Oceans  3
Geared to the non-science major. Integrates physical, chemical, geological and biological principles into an overview that addresses why and how the oceans work. Draws heavily on current ocean issues to illustrate processes and problems.

MAST 314  Comparative Terrestrial and Marine Ecology  3
See ENVC614 for course description

MAST 464  Marine Science Summer Internship  1-3
Students design a research project with an advisor and present it to peers, advisors and course instructor

MAST 466  Independent Study  1-3

MAST 482  Introduction to Ocean Sciences  3
A quantitative introduction to the ocean world including geography, geophysics, chemistry of water and sediments, physics of ocean circulation and waves and tides, description of oceanic and nearshore environments, and biology of the seas.
PREREQ: MATH241 or MATH221; CHEM103 or CHEM111; PHYS201 or PHYS207

MAST 601  Introduction to Oceanography  3
Topics include the geology and history of the ocean floor, oceanic sediments, the physics of the marine environment and the oceanic circulation, chemical processes in the ocean, and biological processes and production in the oceans.
RESTRICTIONS: For non-oceanographers. Requires graduate status.

MAST 602  Physical Oceanography  3
Geographic and hydrodynamic aspects of oceanography. The geography of ocean basins; physical properties of seawater; radiation; and observed distributions of temperature, salinity, oxygen and currents. Scalar and vector fields; hydrostatics; kinematics, momentum dynamics, vorticity dynamics, viscous flow and eddy flux.
RESTRICTIONS: Requires permission of instructor

MAST 603  Introduction to Marine and Aquatic Education  3
Water environments and associated marine and aquatic curricula are highlighted through inquiry learning, lecture and field trips. Emphasized is the integration of science, math, language arts, history and exploratories in development of thematic curricula. For inservice educators.
RESTRICTIONS: Inservice educators only

MAST 615  Introduction to Marine Biology  3
Involves laboratory, field and lecture study for a broad understanding of marine biology and biochemistry.
RESTRICTIONS: For non-biologically oriented marine studies graduate students

MAST 616  Methods in Molecular Biology  2
Conceptual experience in molecular biological techniques with an emphasis on their application to marine related problems. Topics include: nucleic acid extractions, cloning, gene amplification and characterization, and expression methodologies.
PREREQ: MAST604

MAST 617  Methods in Molecular Biology Laboratory  2
A laboratory course to provide practical experience in molecular biological techniques with emphasis on applications to marine related problems.
COREQ: MAST616
MASH 620 **Energy Policy and Administration** 3
See POSC624 for course description

MASH 621 **Coastal Field Biology** 2
Hands-on study of estuarine and coastal communities with emphasis on patchiness in time and space. Instruction in field techniques as well as analysis and presentation of data. Experience in scientific writing.
PREREQ: General biology, ecology, genetics, physiology

MASH 622 **Conservation and Renewable Energy Policy** 3
See UAPP626 for course description.

MASH 623 **Physiology of Marine Organisms** 3
Processes and mechanisms of adaptation of organisms to marine environments. Examines how environmental factors affect physiological processes in marine organisms. Lectures address physiological processes at cellular, whole organism and habitat levels.

MASH 624 **Biological Oceanography** 3
Broad, multidisciplinary approach to marine life and biological processes in the oceans and estuaries. Species composition and biogeography discussed in relation to physical, chemical and geological processes. Examines and quantifies organisms' physiological responses to the abiotic and biotic environment.

MASH 626 **Topics in Halophyte Biology** 1
Analysis of current research in the biology of halophytic plants. Emphasis on student seminars and group discussions of the current literature.
RESTRICTIONS: May be repeated for credit when topics vary.

MASH 627 **Marine Biology** 3
Ecologically oriented study of elementary oceanography, adaptive physiology, aspects of population and community ecology, reef Ecological and larval biology and marine production systems. Emphasis on coastal and estuarine habitats including soft- and hard-substrate intertidal regions, subtidal regions and coral reefs.
PREREQ: General Biology, Ecology, Genetics, and Physiology
RESTRICTIONS: Requires permission of instructor.

MASH 628 **Comparative Environmental Politics** 3
See UAPP627 for course description.

MASH 629 **Topics in Marine Ecology** 1-3
Selected topics in marine ecology and physiology. Topics may vary and will be announced in the registration bulletin.
RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

MASH 631 **Marine Geology** 3
See GEO631 for course description.

MASH 633 **Image Processing** 3
See ELEG633 for course description.

MASH 634 **Marine Biochemistry** 3
Addresses biochemical processes and enzyme, metabolic and structural adaptations of marine plants and animals. Discussions on topics such as enzyme kinetics, enzyme structure and metabolic pathways to organisms in the marine environment.
RESTRICTIONS: Requires sufficient background in chemistry and permission of instructor.

MASH 635 **Turbulence in the Environment** 3
Fundamentals of turbulence including the dynamics of vorticity, the cascade of energy and the theory of Kolmogorov, turbulent diffusion and turbulence in density stratified flows. Applications to many engineering disciplines as well as to meteorology and oceanography.

MASH 636 **Applied Ocean Science Seminar** 1
Invited speakers from university, industry and government research laboratories will discuss the latest advances in modeling and measurement of physical and biological properties of the oceans and coastal regions. Use of satellite remote sensing data and acoustic data in studies of ocean currents, waves, air-sea interaction turbulence, pollutant dispersion and coastal productivity will be emphasized.

MASH 640 **Opto-electronics** 3
See ELEG640 for course description.

MASH 645 **General Oceanography** 3
Introduction to the science of oceanography for teachers, emphasizing the physical and natural sciences, nature of the subject matter and application to social schemes. Where applicable mid-Atlantic environments are emphasized to demonstrate physical, chemical, geological and biological themes associated with oceanographic sciences.
RESTRICTIONS: Offered off-campus, for public school teachers and general public.

MASH 646 **Chemical Oceanography** 3
Composition of seawater; physicochemical properties of seawater distributions of gases, nutrients and trace metals; and effect of biological processes on seawater composition.
PREREQ: CHEM103 and CHEM104.

MASH 647 **Physical Chemistry of Seawater** 3
Introduction to chemical equilibria in seawater. Topics include electrolyte theory, gas solubility, chemical speciation, acid-base equilibria and the carbon dioxide system. Emphasizes use of computer techniques to study oceanic chemical processes.
PREREQ: One year of chemistry.
RESTRICTIONS: Computer experience not required.

MASH 650 **Clay Mineralogy** 3
Crytallography, chemistry, physical properties, occurrence, origin and alterations of the clay- and related minerals; theory and techniques of identification, characterization and quantitative analysis using x-ray diffraction and electron microscopy; and cation exchange and size characteristics of clay minerals. Discussion of related topics, colloidal chemistry, lithotrophic behavior, etc. May be cross-listed with GEO650 and/or PLSC650.

MASH 670 **U.S. Ocean and Coastal Policy** 3
Provides an overview and assessment of the evolution of U.S. ocean and coastal policies, including such policy areas as coastal management, fisheries management, marine mammal protection, offshore oil development, and marine pollution control.

MASH 671 **Coastal Processes and Management** 3
Introduction to key processes operating in the coastal zone and to management techniques appropriate to these processes and environments. Emphasis on policy, regulatory and intergovernmental complexities that characterize coastal zone management in the United States and in other coastal nations.

MASH 672 **Applied Policy Analysis** 3
Empirical analysis of environmental and natural resource policy issues. Topics include valuation of natural resources, decision making under uncertainty, dynamic control and intertemporal issues in resource use and institutional aspects of policy analysis. May be cross-listed with ECON670.
PREREQ: ECON401.

MASH 673 **International Law** 3
Origins, sources and applications of law to international relations, including the nature of treaties, the legal powers of states and international organizations, jurisdiction and immunities, and the role of international courts. Special attention given to the law of the sea for navigation, fisheries conservation, mineral exploitation and environmental protection. May be cross-listed with POSC640.
RESTRICTIONS: Requires permission of instructor.

MASH 674 **Legal Aspects of the Coastal Zone** 3
Examines basic legal doctrines and public policy implications relevant to the development and protection of the coastal zone of the United States. Use, ownership and control of water and land beneath and bordering upon water; relationships between the states and the federal government in areas of marine affairs; environmental protection and legal control of water pollution.
RESTRICTIONS: Requires permission of instructor.

MASH 675 **Economics of Natural Resources** 3
Study of the allocation of natural resources, especially marine and coastal zone resources, in modern economics. Application of economic theory to the problems of misallocations and the means of correction, under both free and planned markets. May be cross-listed with ECON675.
RESTRICTIONS: Requires permission of instructor.

MASH 676 **Environmental Economics** 3
Study of the choice of policies to protect the environment, including land, air and water resources. Theory of market failure and externalities, use of economic incentives in policy design, valuation of environmental resources and examination of inefficiencies in existing U.S. environmental policies. May be cross-listed with ECON676.
PREREQ: ECON300.

MASH 677 **International Ocean and Environmental Policy** 3
Focuses on understanding the strengths and weaknesses of the legal framework which governs ocean resources, ocean space and the environment beyond the limits of national jurisdiction. Evaluates international conventions which pertain to the ocean and environment as to impact and effectiveness.

MASH 678 **Coastal and Maritime Law** 3
Introduction to U.S. coastal and maritime law including legal issues of coastal title and boundaries, beach access, public trust doctrine, and carriage of goods by sea, torts against seamen, collisions, salvage, and marine pollution. May be cross-listed with POSC678 and/or UAPP678.
RESTRICTIONS: Open to Juniors, Seniors and graduate students.

MASH 679 **Shipping and Port Management** 3
A seminar to study the structure and management of the shipping industry and ports, policies for ocean commerce, international trade, and merchant marine. May be cross-listed with POSC679.

MASH 681 **Remote Sensing of Environment** 3
Detection and mapping of land and ocean resources with optical, infrared and microwave sensors. Digital analysis of satellite images using multispectral and spatial analysis techniques and correlation with ground/ship data. Application to oceanography, coastal processes, geology, land use, geography, agriculture, climate and pollution studies. May be cross-listed with ELEG681 and/or GEOG681.
RESTRICTIONS: Requires permission of instructor.
MAST 682 CURRENT TOPICS IN APPLIED OCEAN SCIENCE 1-3
Advanced treatment of selected areas of the applied ocean sciences, including acoustics, oceanography, fluid mechanics, biology, and oceanic modeling. May be repeated for credit with change of topic.

MAST 683 STRUCTURAL MATERIALS IN SEAWATER 3
Electrochemical, physical and biological interactions of metals, polymers, concrete, wood and composites with seawater. Emphasis on materials selection and deterioration prevention measures.

MAST 684 PARTICLES IN THE AQUEOUS SYSTEM 3
Deals with all aspects of particle fluctuation that occur within the bounds of the natural environment. Merges together from a number of fields (physics, engineering, chemistry and biochemistry) the theories, equations and principles that bear on the natural aqueous environment.

MAST 685 FUNDAMENTALS OF ACOUSTICS 3
Covers fundamentals of sound and vibration, including equations governing vibrating string, vibration of bars, two-dimensional wave equation in plates, acoustic wave equation, transmission phenomena and acoustic radiation and reception. Other topics include absorption and attenuation of sound, resonators and ducts and filters, in the context of environmental and underwater acoustics.

MAST 686 REMOTE SENSING SEMINAR 1
Basic and applied research topics in remote sensing of earth resources, coastal processes, marine productivity, ocean dynamics and climatic effects presented by University students, faculty and guest speakers. Stresses advanced data acquisition and spectral and spatial image analysis techniques.

MAST 687 COLLOIDAL SCIENCE SEMINAR 1
Basic scientific and applied research topics in colloidal science presented by University students, faculty and guest speakers. Stress the processes related to fine particles in the marine environment.

MAST 691 OCEAN FLUID DYNAMICS 4
See CIEG659 for course description.

MAST 692 ENVIRONMENTAL VALUES, MOVEMENTS AND POLICY 3
Examines citizens' beliefs and values, voluntary environmental groups and the ways in which individuals and groups affect environmental policy. Shows how research in areas such as environmental sociology and ecological anthropology can inform policy. May be cross-listed with UAPP692.

MAST 693 WAVES IN THE MARINE ENVIRONMENT 3
General principles of wave mechanics, kinematics and dynamics. Applications to surface gravity waves, acoustic waves, electromagnetic waves and large scale geophysical waves. May be cross-listed with CIEG693.

MAST 800 DYNAMICAL PHYSICAL OCEANOGRAPHY 3
Topics include basic definitions, conservation of mass, conservation of momentum, conservation of vorticity, horizontal frictionless flow, wind-driven circulation, stability and double diffusion, thermohaline circulation and tides.

MAST 806 GEOPHYSICAL FLUID DYNAMICS I 3
Development of the fundamental fluid dynamics used in analyzing flows in physical oceanography and meteorology. Fundamentals of vorticity dynamics and geostrophy, inviscid theory of Rossby waves, and Ekman boundary layers.

MAST 808 COASTAL/ESTUARINE PHYSICAL DYNAMICS 3
Coastal and estuarine dynamics covering continental shelf wind-forced circulation; continental shelf waves; modes of estuarine circulation; shelf-estuary interaction; shelf break; front dynamics; and estuarine and river plume fronts.

MAST 809 THE OCEAN AND CLIMATE VARIATION 3
Study of the ocean-atmosphere system; the fluxes of heat, water and energy in the ocean and interchanges with the atmosphere; budgets and mechanisms of exchange; and interannual and long-term climate variations as related to the ocean.

MAST 811 OCEANOGRAPHIC TIME SERIES ANALYSIS 3
Quantitative techniques for data processing and time series analysis. Topics include basic definitions, linear systems, digital filters, statistical techniques, auto-spectrum estimation, cross-spectrum estimation, Monte Carlo technique, empirical orthogonal function analysis and rotary spectrum estimation.

MAST 814 POLITICAL ECONOMY OF THE ENVIRONMENT 3
See UAPP810 for course description.

MAST 815 DEEP-SEA SEDIMENTATION 3
Students will examine the formation of deep-sea sediments. Emphasis will be placed on the geographic distribution of sediments, the processes that developed these sediments, and how they relate to global paleoceanographic and paleoclimatic changes.

MAST 816 BIOLOGICAL OCEANOGRAPHIC PROCESS 1-4
Multidisciplinary approach to the abundance and distribution of organisms in the ocean, the physiological and behavioral responses of organisms to the abiotic and biotic environment and the role of organisms in modifying the environment. Taught as six modules: algae, bacteria, protozoa, zooplankton, benthos, fish and fisheries.

MAST 820 EXPERIMENTAL DESIGN SEMINAR 1
Forum for presentation of research plans or results with emphasis on experimental design and data analysis. Ensuring discussion aids preparation of research proposals and sharpen critical assessment of own and colleagues' work.

MAST 821 MARINE BIOLOGY/BIOCHEMISTRY SEMINAR 1
With each offering, addresses a different specific topic, e.g., tropical marine biology, larval dispersal, estuarine productivity, etc.

MAST 823 PHYTOPLANKTON BIOLOGY 3
Comprehensive treatment of the structure, biochemistry, physiology and ecology of phytoplankton to understand its distribution and growth in the sea. Aspects include spatial and temporal variations of phytoplankton biomass and production, mechanisms of growth, photosynthesis and nutrient uptake; mechanisms of physiological adaptation to environmental variables; and structural and biochemical bases of phytoplankton taxonomy and biogeography.

MAST 827 CURRENT TOPICS IN MARINE BIOLOGY 1-4
Subject areas change each term and will be announced in the registration booklet. Topics include aspects of plant biology, fish and invertebrate ecology and other aspects of marine ecology. May include lectures, tutorials and demonstration of techniques.

MAST 828 CURRENT TOPICS IN MARINE BIOCHEMISTRY 1-4
Subject areas change each term and will be announced in the registration booklet. Topics include marine chemical ecology, marine natural products chemistry, marine biochemistry of marine plants and animals. May include lectures, tutorials and demonstration of techniques.

MAST 831 ESTUARINE AND SHELTERED GEOLOGICAL OCEANOGRAPHY 3
Origin, distribution and character of sediments deposited in the estuarine and shelf environment. Identifies interaction of sediments and physical, biological and chemical processes.

MAST 834 ENVIRONMENTAL VALUES, MOVEMENTS AND POLICY 3
Survey topographic techniques in oceanography, environmental values, environmental policy and the ways in which individuals and groups affect environmental policy.

MAST 836 PHYSICAL OCEANOGRAPHY 3
Principles, capabilities and limitations of analytical methods to the chemistry of marine waters and sediments. Analytical methods include electroanalytical, spectrophotometric, chromatographic, electron microscopy and surface techniques. Emphasis on the analysis of trace components (biochemical, inorganic and organic) in the marine environment. Laboratory experiments. Topics vary and will be announced in the registration booklet.

MAST 847 CURRENT TOPICS IN CHEMICAL METHODS IN OCEANOGRAPHY 1-3
Principles, capabilities and limitations of analytical methods to the chemistry of marine waters and sediments. Analytical methods include electroanalytical, spectrophotometric, chromatographic, electron microscopy and surface techniques. Emphasis on the analysis of trace components (biochemical, inorganic and organic) in the marine environment. Laboratory experiments. Topics vary and will be announced in the registration booklet.

MAST 848 CHEMICAL OCEANOGRAPHY 3
Chemical evolution and formation of the ocean; chemistry of marine sediments; transfer of chemicals to and from the ocean (weathering and global cycles); marine precipitates; chemical principles of marine geological reactions (solubility and redox); sediment diagenesis and paleoceanography; and use of stable and radiotopes in the oceans.

MAST 849 ORGANIC CHEMICAL OCEANOGRAPHY 3
Covers organic chemical studies of seawater and processes that influence organic reactions in seawater. Laboratory devoted to methodology for analyses of organic compounds in seawater and marine organisms.

PREREQ: Organic Chemistry
MATH 850 Marine Inorganic Chemistry
Principles of inorganic chemistry are used to explain and to understand the speciation and reactivity of the elements in the marine environment. Emphasis on the mechanistic aspects of important marine processes including mineral dissolution and formation, electron transfer reactions and the role of metals in biogeochemical reactions. May be cross-listed with CHEM 855.
PREREQ: MATH 664, aquatic chemistry or physical chemistry.

MATH 853 Oceanography Seminar
A review of current oceanographic literature through student presentations.
RESTRICTIONS: May be repeated for credit when topics vary.

MATH 854 Marine Sedimentary Geochemistry
Fluxes of major, minor, trace and nutrient elements from ocean waters to marine sedimentary deposits, with emphasis on the deposition of material on the ocean floor, the reaction and transport regimes in sediments that redistribute this material, and return fluxes from sediments to the overlying water.
PREREQ: MATH 664.

MATH 855 Coastal and Estuarine Chemistry
Distributions, behavior, and chemical processes in estuarine and coastal waters are examined in this advanced general chemical oceanography course. Greater heterogeneity of physical controls and anthropogenic influences give a unique nature to this coastal corridor in the global flux from land to sea.
PREREQ: MATH 664.

MATH 856 Biogeochemical Oceanography
Modular graduate seminar of individual offerings inspects aspects of marine biogeochemical cycle. Includes such topics as atmospheric and oceanic fluxes, climatic feed back controls involving the ocean, and the role of the marine environment in global change.
RESTRICTIONS: May be repeated for credit when topics vary.

MATH 868 Research
Current topics in marine policy based on recent journal articles and active research and policy relevant activities of students, faculty and visitors from other universities and government agencies. Emphasis on research design and formats for oral and written presentation of results.
RESTRICTIONS: May be repeated for credit when topics vary.

MATH 869 Master's Thesis
The various classes of functions and their graphs are explored. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 221 and MATH 241) are emphasized.
PREREQ: MATH 610 or MATH 612.
RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 110 Intermediate Algebra
Review skills necessary for Pre-calculus and College Mathematics courses. Topics include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions.
RESTRICTIONS: Requires arithmetic and Algebra I skills.

MATH 12 Concepts of Intermediate Algebra
Reviews skills necessary for Pre-calculus and College Mathematics courses. Topics (when three credits are completed) include a review of sets, operations with polynomial and rational expressions, solving equations and inequalities, and an introduction to the coordinate plane and functions.
RESTRICTIONS: Requires arithmetic and Algebra I skills.

MATH 114 College Mathematics and Statistics
Stresses mathematical concepts and algebraic skills with a strong emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics including descriptive and inferential statistics.
PREREQ: MATH 102 or MATH 101.
RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 15 Pre-Calculus
The various classes of functions and their graphs are explored. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 221 and MATH 241) are emphasized.
PREREQ: MATH 1010 or MATH 1012.
RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 117 Precalculus for Scientists and Engineers
Designed to prepare students for MATH 241. All topics covered in MATH 115 will be covered as well as additional topics in functions, trigonometry, linear systems, parabolas and sequences. Includes a lab/workshop.
PREREQ: MATH 1010 or MATH 1012; or 2 years of high school algebra.
RESTRICTIONS: Only four credits from any combination of MATH 114, MATH 115, MATH 117, MATH 170, MATH 171 and MATH 172 can count towards graduation.

MATH 170 Self-Paced College Mathematics and Statistics
Stresses mathematical concepts and algebraic skills with an emphasis on applications in the areas of management, life and social sciences. Topics include various function classes and models, linear programming and statistics. Variable credit allows the student to complete the course at a slower pace.
PREREQ: MATH 1010 or MATH 1012.
RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171, and MATH 172 can count toward graduation.

MATH 171 Self-Paced Pre-Calculus
Explores the various classes of functions and their graphs. Function classes include linear, quadratic, polynomial, rational, exponential, logarithmic and trigonometric. Emphasizes skills needed for calculus (MATH 221 and MATH 241). Variable credit option provides an opportunity to change the pace of the course.
PREREQ: MATH 1010 or MATH 1012.
RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 172 Algebra and Precalculus
Mastery-based algebra review followed by concepts required for MATH 221 developed around functions and their graphs (polynomial, rational, logarithmic and exponential). Variable credit option provides an opportunity to change the pace of the course. May be repeated for credit when topics vary.
PREREQ: MATH 221.

MATH 179 Problem Solving Strategies
Designed to study a multitude of problem solving strategies such as working backwards, look for a pattern, etc. In particular we will emphasize the use of these strategies with the content that secondary mathematics teachers normally teach.
MATH 210 DISCRETE MATHEMATICS 3
Set theory, logic, induction, number systems, counting, introduction to graph theory, sequences and formal power series.
PREREQ: MATH 115.

MATH 221 CALCULUS I 3
Topics include functions, graphing functions, limits, derivatives, sequences, series, exponential and logarithmic functions, and integration.
RESTRICTIONS: Requires two years of high school algebra and one year of geometry. Credit cannot be received for both MATH 221 and MATH 241.

MATH 222 CALCULUS II 3
Topics include integration, Taylor polynomials, series, multivariable calculus and trigonometric functions.
PREREQ: MATH 221.
RESTRICTIONS: For students in the behavioral, management and social sciences. Credit cannot be received for both MATH 222 and MATH 242.

MATH 230 FINITE MATHEMATICS WITH APPLICATIONS 3
Set theory, probability, optimization, linear programming and an introduction to matrix methods.
PREREQ: MATH 221.
RESTRICTIONS: For students in the behavioral, management and social sciences.

MATH 241 ANALYTIC GEOMETRY AND CALCULUS A 4
Functions, limits, continuity, derivatives and definite integrals.
RESTRICTIONS: Requires two years of high school algebra, one year of geometry and trigonometry. Credit cannot be received for both MATH 241 and MATH 221.

MATH 242 ANALYTIC GEOMETRY AND CALCULUS B 4
Exponential and log functions, inverse trig functions; integration techniques; parametric curves; polar coordinates; infinite series. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH 241.
RESTRICTIONS: Credit cannot be received for both MATH 242 and MATH 222.

MATH 243 ANALYTIC GEOMETRY AND CALCULUS C 4
Vectors, operations on vectors, velocity and acceleration, partial derivatives, directional derivatives, optimization of functions of two or more variables, integration over two and three dimensional regions, line integrals, Green's Theorem. Includes use of the computer package, Maple, to perform symbolic, numerical and graphical analysis.
PREREQ: MATH 242.

MATH 245 AN INTRODUCTION TO PROOF 3
Basic set operations, relations, equivalence relations, functions, inverse functions, cardinality, order properties of real numbers, least upper bound, greatest lower bound, completeness axiom, topology of reals, complex numbers.
PREREQ: MATH 210 and MATH 243.

MATH 251 MATHEMATICS FOR THE ELEMENTARY SCHOOL I 3
Basic concept development in sets, number systems, functions, system of whole numbers and related algorithms, selected topics from number theory, and integers. Emphasis placed on problem solving and general number sense.
RESTRICTIONS: Requires School of Education Mathematics Competency Test.

MATH 252 MATHEMATICS FOR THE ELEMENTARY SCHOOL II 3
Basic concept development in rational numbers expressed as fractions and decimals, proportional reasoning, percent, properties of real numbers, basic statistical topics and probability.
PREREQ: MATH 251.

MATH 253 MATHEMATICS FOR ELEMENTARY SCHOOL III 3
Basic geometric concept development in classifying and analyzing basic two and three dimensional geometric shapes, the role of definitions, symmetry, congruence, similarity, Euclidean constructions, measurement topics including linear and regional, coordinate geometry and graphing in a plane.
PREREQ: MATH 252.

MATH 280 INSIGHTS INTO MATHEMATICS 3
A basic course. Mathematics presented as a human endeavor. Topics include problem solving, reasoning and modeling.
PREREQ: MATH 114 or MATH 115.
RESTRICTIONS: For liberal arts students not necessarily planning further study in mathematics.

MATH 302 ORDINARY DIFFERENTIAL EQUATIONS 3
Solutions and applications of ordinary differential equations as well as systems. Considers initial value problems and boundary value problems. Topics include Laplace transform, the phase plane, series solutions and partial differential equations. Includes use of the computer package Maple.
PREREQ: MATH 243.
RESTRICTIONS: Credit will not be given for both MATH 302 and either MATH 341, MATH 342, MATH 351 or MATH 352.

MATH 303 DIFFERENTIAL EQUATIONS COMPUTING LAB 1
Provides computing experience in differential equations.
COREQ: MATH 302.

MATH 305 APPLIED MATHEMATICS FOR CHEMICAL ENGINEERING 3
A special applied mathematics course designed for chemical engineering majors. Emphasis is on the interaction between mathematical theory and its engineering applications. May be cross-listed with CHEG 305.
PREREQ: MATH 302.
RESTRICTIONS: For chemical engineering majors only.

MATH 315 DISCRETE MATHEMATICS II 3
Algorithmic graph theory, correctness and complexity of algorithms, recurrence relations, numerical algorithms, algorithms for polynomials (such as Horner's method).
PREREQ: MATH 210 and MATH 241.

MATH 341 DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA I 3
Topics include first and second order differential equations, systems of algebraic equations, determinants, vector spaces, eigenvalues and eigenvectors of matrices and systems of differential equations. Emphasis on the interaction between these topics and appropriate physical systems.
PREREQ: MATH 242.
RESTRICTIONS: Credit not given for both MATH 341 and either MATH 302, MATH 342 or MATH 351. Open to ELEG and CPEG students only.

MATH 342 DIFFERENTIAL EQUATIONS WITH LINEAR ALGEBRA II 3
A continuation of MATH 341. Topics include series solutions, Laplace transform methods, boundary value problems, orthogonality, higher order equations, difference equations and numerical techniques. Continued emphasis on the interaction between these topics and physical systems.
PREREQ: MATH 341.
RESTRICTIONS: Credit not given for both MATH 342 and either MATH 302, MATH 342 or MATH 352. Open to ELEG and CPEG students only.

MATH 349 ELEMENTARY LINEAR ALGEBRA 3
PREREQ: MATH 230 or MATH 242.
RESTRICTIONS: Credit not given for both MATH 349 and either MATH 341, MATH 342 or MATH 351.

MATH 351 ENGINEERING MATHEMATICS I 3
Solutions of linear algebraic equations, Gauss elimination, vector spaces, subspaces, linear dependence, linear ordinary differential equations of 2nd order and higher, initial value and boundary value problems, eigenvalues, coupled linear ordinary differential equations, nonlinear differential equations, with engineering applications.
PREREQ: MATH 243.
RESTRICTIONS: Credit not given for both MATH 351 and either MATH 302, MATH 341 or MATH 349. Open to ELEG and CPEG students only.

MATH 352 ENGINEERING MATHEMATICS II 3
Laplace transform, application to constant coefficient ordinary differential equations, power and vector fields, Laplacian, line integrals, divergence theorem, Stokes' theorem, Fourier series, orthogonality, diffusion equation, Laplace's equation, wave equation, separation of variables, with engineering applications.
PREREQ: MATH 351.
RESTRICTIONS: Open to ELEG and CPEG students only.

MATH 353 ENGINEERING MATHEMATICS III 3
PREREQ: MATH 351.
COREQ: MATH 352.
RESTRICTIONS: Open to ELEG and CPEG students only.

MATH 366 INDEPENDENT STUDY 1-6

MATH 379 PROBLEM SOLVING STRATEGIES 1
Studies a multitude of problem solving strategies such as looking for a pattern, making a model, working backwards, etc.
COREQ: MATH 380.
RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics.

MATH 380 APPROACHES TO TEACHING MATH 3
Aims, course planning, instructional strategies, evaluation and selection of materials for teaching mathematics in secondary schools.
COREQ: MATH 379.
RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics.

400
MATH 381 PRACTICUM IN SECONDARY MATHEMATICS 1 PF
Teaching experience in a clinical setting, the Math Center. Helps develop an inquiring attitude: to be a perceptive observer of the learning behaviors of those taught, one must develop hypotheses about the causes of misconceptions, means of diagnosing them and methods of treatment (including use of technology).

COREQ: MATH243

RESTRICTIONS: Requires permission of the Committee on Secondary School Mathematics. Not for major (B.A. or B.S.) or minor credit in Mathematical Sciences.

MATH 389 GRAPH THEORY 3
Basic graph theory (paths and circuits, trees and forests, connectivity and coloring theorems) and network flow theory. Applications to areas such as economics, engineering, chemistry and sociology.

PREREQ: MATH210

MATH 401 INTRODUCTION TO REAL ANALYSIS 3
A rigorous treatment of one variable calculus. Topics will include sequences of real numbers, limit theorems, monotone sequences, Cauchy sequences, Bolzano-Weierstrass Theorem, continuity, uniform continuity, differentiability and Riemann integral.

PREREQ: MATH245

MATH 426 INTRODUCTION TO NUMERICAL ANALYSIS AND ALGORITHMIC COMPUTATION 3
Direct and iterative methods for solution of algebraic equations and systems of linear equations, matrix inversion, pseudo-inverses, algebraic eigenvalue problems, linear least-square problems and nonlinear equations. Stresses both numerical analysis and algorithmic aspects. May be cross-listed with CISC410.

PREREQ: MATH349 and CISC106

RESTRICTIONS: Requires familiarity with computing (e.g., programming language).

MATH 428 ALGORITHMIC AND NUMERICAL SOLUTION OF DIFFERENTIAL EQUATIONS 3
Algorithms for numerical integration and differentiation. Initial value problems; boundary value problems in ordinary differential equations; finite difference (explicit and implicit) methods; polynomial and spline approximation; finite elements and collocation; and introduction to numerical methods for partial differential equations. May be cross-listed with CISC411.

PREREQ: MATH426 or CISC410.

MATH 451 ABSTRACT ALGEBRA 1 3
Basic properties of the integers and the rationals, fields of quotients, polynomial rings, ring-homomorphism, introduction to groups and vector spaces.

PREREQ: MATH349 and MATH245

MATH 466 INDEPENDENT STUDY 1-6
Change of variables, surface integrals, Stokes' theorem, divergence theorem, calculus of variations, Euler's equation, brachistochrone, isoperimetric problem, Fourier series, pointwise and mean square convergence, vibrating string. Fourier transform, inversion formula, heat equation on a half-line.

PREREQ: A 300 or higher level course on differential equations.

MATH 503 ADVANCED CALCULUS FOR APPLICATIONS 3
Introduction to analytic functions, contour integration, power series, residues and conformal mapping.

PREREQ: MATH242 or equivalent.

MATH 508 INTRODUCTION TO COMPLEX VARIABLES AND APPLICATIONS 3
Introduction to analytic functions, contour integration, power series, residues and conformal mapping.

PREREQ: MATH242.

MATH 510 MODELING AND ANALYSIS OF ENVIRONMENTAL SYSTEMS 3
An elementary course to introduce basic analytical and numerical methods for studying mathematical problems arising in environmental sciences.

PREREQ: MATH242 or equivalent.

RESTRICTIONS: Open to Environmental Science graduate students or by consent of instructor.

MATH 512 CONTEMPORARY APPLICATIONS OF MATHEMATICS 3
Aimed at providing hands-on learning experience in contemporary applications of mathematics. Involves work with investigators from industry, national laboratories and other departments. Mathematical topics may include ordinary and partial differential equations, systems of differential equations, transforms, asymptotic and numerical methods.

PREREQ: A 300 or higher level course on differential equations.

MATH 518 MATHEMATICAL MODELS AND APPLICATIONS 3
Illustration and analysis of mathematical models for problems in the physical, biological and social sciences.

PREREQ: Either MATH230 or MATH349, and STAT300 or STAT370.

MATH 529 LINEAR PROGRAMMING: METHODS AND APPLICATIONS 3
Theory of linear programming (linear inequalities, convex polyhedra, duality), related topics (games, integer programming), main algorithms (simplex, dual) and representative applications in agriculture, economics, engineering, operations research and mathematics. Familiarity with computer implementation of LP methods acquired by individual (or small group) projects of applying LP to the students' chosen areas.

PREREQ: MATH349.

MATH 540 GEOMETRY 3
Axiomatic systems, transformations; Euclidean, projective and hyperbolic geometry.

PREREQ: MATH349.

RESTRICTIONS: Graduate credit only for teachers.

MATH 581 ON THE NATURE OF PROOF 3
Designed for secondary teachers to show how to investigate a problem, develop ideas, test conjectures, and, if appropriate, prove that resulting statements are correct. Problems, including proofs, are chosen from the areas of algebra, pre-calculus, geometry and number theory.

PREREQ: BA/BS Math or Math Ed.

RESTRICTIONS: Credit to be used only in graduate programs in Mathematics education.

MATH 582 STUDIES IN DISCRETE MATHEMATICS 3
Designed to show secondary teachers how discrete mathematics underlies the science and technology specific to the computer age. Using the NCTM Standards as a guide, topics include relations, combinatorics, graph theory, sequences, and linear programming, as well as associated algorithms.

PREREQ: MATH581.

RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 583 PROBABILITY AND STATISTICS FOR EDUCATION 3
Designed specifically for middle and secondary teachers. Topics emphasized include graphical methods, probability models, statistical inference and study design. Offers an orientation to popular software packages. Applications selected from current literature.

PREREQ: Undergraduate statistics course.

RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 584 ADVANCED SECONDARY MATHEMATICS METHODS 3
Designed to develop perspectives, knowledge, and frameworks which an inservice teacher can use to organize, interpret and critique their own teaching experience and that of others.

RESTRICTIONS: Requires permission of instructor. Credit to be used only in graduate programs in mathematics education.

MATH 585 TECHNOLOGY IN SECONDARY MATHEMATICS 3
Major emphasis on learning how to use computer software to enhance both the teaching and learning of algebra, geometry, statistics, probability and precalculus. Participants get hands-on experience with a function plotter, spreadsheet, geometry package and a statistical/probability package.

RESTRICTIONS: Working knowledge of graphing calculators. Credit to be used only in graduate programs in mathematics education.

MATH 586 PROBLEM SOLVING II 1
Designed to offer secondary teachers an opportunity to face and solve nonroutine problems. Teachers will become familiar with problem solving strategies that can be used not only with nonroutine problems but also with standard problems in an existing mathematics curriculum.

RESTRICTIONS: Requires permission of instructor. Credit to be used only in graduate programs in mathematics education.

MATH 587 PROBLEM SOLVING II 1
Continuation of MATH586. Emphasis on "introspection" of participants into how they themselves solve problems. Provides teachers an opportunity to engage in and explore techniques for generating problems, solving problems, and reflecting on the processes used in such activities.

PREREQ: MATH586.

RESTRICTIONS: Credit to be used only in graduate programs in mathematics education.

MATH 600 FUNDAMENTALS OF REAL ANALYSIS 3
Rigorous introduction to classical real analysis. Brief review of real numbers and a thorough discussion of the basic topology of metric spaces. Covers in detail the following topics: the analysis of sequences and series, continuity, differentiation and Taylor's theorem, and the analysis of sequences and series of functions.

PREREQ: MATH401.

MATH 602 ADVANCED CALCULUS - INTRODUCTION TO ANALYSIS II 3
Continuation of MATH600.

PREREQ: MATH600.

MATH 611 INTRODUCTION TO NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING I 3
Introduction to numerical computing, analysis and solution of systems of linear equations, linear least-squares, eigenvalue problems, methods for unconstrained optimization, solution of systems of nonlinear equations. Experience with standard computer packages, code development and simulations of applied problems.

PREREQ: MATH503 or MEEG863 or PHYS207.

MATH 612 INTRODUCTION TO NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING II 3
Approximation, interpolation, data fitting and smoothing, numerical methods for ordinary differential equations. Additional topic selected at discretion of instructor. Experience with standard computer packages, code development and simulations of applied problems.

PREREQ: MATH503 or MEEG863 or PHYS207.

401
MATH 613 APPLIED SYMBOLIC COMPUTATION 3
See CISC 423 for course description

MATH 616 INTRODUCTION TO APPLIED MATHEMATICS I 3
Introduction to ideas and techniques used in solving problems arising in a variety of physical settings. Stability of nonlinear systems of ODE's, Sturm-Liouville problems and Green's functions. The wave, heat and Laplace equations. Elementary analysis of some nonlinear PDE's, special functions, asymptotic expansions and perturbation theory.
PREREQ: One semester of advanced calculus and PHYS 208

MATH 617 INTRODUCTION TO APPLIED MATHEMATICS II 3
Continuation of MATH 616.
PREREQ: MATH 616
RESTRICTIONS: Familiarity with systems treated acceptable in lieu of prerequisite.

MATH 630 PROBABILITY THEORY AND APPLICATIONS 3
Introduction to probability theory as background for further work in statistics or stochastic processes. Sample spaces and axioms of probability; discrete sample spaces having equally likely events; conditional probability and independence; random variables; classical discrete and continuous random variables; mathematical expectation and moments of a distribution; Chebychev's inequality; and law of large numbers and central limit theorem.

MATH 631 INTRODUCTION TO STOCHASTIC PROCESSES 3
Classical stochastic processes with emphasis on their properties which do not involve measure theory. Course content: Markov chains in discrete and in continuous time with examples from random walk, birth and death processes, branching processes and queuing theory. Renewal and Markov renewal processes. Basic notions of Brownian motion and second-order processes.
PREREQ: MATH 630

MATH 650 ABSTRACT ALGEBRA 3
Modular arithmetic, Chinese remainder theorem, rings (including polynomial rings), ideals and quotient rings, groups and homomorphism theorems, unique factorization and principal ideal domains, field extensions.
PREREQ: MATH 349

MATH 672 VECTOR SPACES 3
Vector spaces, linear transformations, decomposition theorems and bilinear forms.
PREREQ: MATH 349

MATH 688 COMBINATORICS AND GRAPH THEORY WITH APPLICATIONS I 3
Permutations and combinations, generating functions and other enumeration techniques, recurrence relations, basic graph theory, partially ordered sets, combinatorial optimization and time complexity.
PREREQ: An undergraduate course in linear algebra.

MATH 689 COMBINATORICS AND GRAPH THEORY WITH APPLICATIONS II 3
Methods of linear algebra in combinatorics and graph theory, basics of coding theory and associated designs, number theory and cryptography, communication complexity.
PREREQ: Knowledge of linear algebra.

MATH 694 METHODS OF OPTIMIZATION 3
Review of linear programming, unconstrained and constrained nonlinear programs, numerical methods, Kuhn-Tucker theory, duality and Lagrange multipliers.
PREREQ: MATH 649

MATH 698 THEMATIC SEMINAR 2 PF
Topics chosen from ordinary differential equations, harmonic analysis, optimization theory and integral equations.
PREREQ: MATH 609 and MATH 805

MATH 610 COMPLEX ANALYSIS 3
Conformal mapping with applications; analytic continuation; Riemann surfaces; elliptic functions; and infinite products
PREREQ: MATH 807

MATH 810 ASYMPTOTIC AND PERTURBATION METHODS 3
Asymptotic expansions of real and complex integrals; singular perturbation theory for ODEs and PDEs; WKBJ and multiple scale expansion techniques. Selected applications.
PREREQ: MATH 602 and knowledge of analytic function theory or consent of instructor.

MATH 812 INVERSE PROBLEMS 3
Illposed problems, regularization methods, Tikhonov regularization, the discrepancy principle, regularization by discretization. Selected topics from nonlinear inverse problems.
PREREQ: MATH 617 and MATH 806.

MATH 815 NONLINEAR FUNCTIONAL ANALYSIS 3
Fixed point theorems, differential calculus in normed spaces, implicit function theorem, variational methods, monotone operators and variational inequalities. Selected applications.
PREREQ: MATH 806.

MATH 818 THEORY OF ORDINARY DIFFERENTIAL EQUATIONS I 3
Linear systems with isolated singularities and systems with periodic coefficients; boundary value problems; Poincare-Bendixon theory.
PREREQ: MATH 609 and MATH 805

MATH 821 TOPICS IN APPLIED ANALYSIS 3
Topics chosen from ordinary differential equations, harmonic analysis, optimization theory and integral equations.
RESTRICTIONS: Requires permission of instructor.

MATH 822 INTEGRAL EQUATIONS 3
RESTRICTIONS: Requires permission of instructor.

MATH 823 TOPICS IN DIFFERENTIAL AND INTEGRAL EQUATIONS 3
Topics chosen from ordinary and partial differential equations and singular and nonlinear integral equations.
RESTRICTIONS: Requires permission of instructor.

MATH 824 TOPOLOGY AND APPLICATIONS II 3
Modern aspects of topology and applications to various fields, including functional analysis, algebraic topology, differential geometry, and algebraic K-theory.
RESTRICTIONS: Requires permission of instructor.

MATH 826 TOPOLOGY AND APPLICATIONS III 3
Topics on advanced topics in topology and their applications, such as algebraic topology, differential geometry, and algebraic K-theory.
RESTRICTIONS: Requires permission of instructor.

MATH 827 TOPOLOGY AND APPLICATIONS IV 3
Advanced topics in topology and their applications, including algebraic topology, differential geometry, and algebraic K-theory.
RESTRICTIONS: Requires permission of instructor.

MATH 828 TOPOLOGY AND APPLICATIONS V 3
Topics on advanced topics in topology and their applications, including algebraic topology, differential geometry, and algebraic K-theory.
RESTRICTIONS: Requires permission of instructor.

MATH 835 PARTIAL DIFFERENTIAL EQUATIONS I 3
First order differential equations and systems. Existence and uniqueness for elliptic, parabolic and hyperbolic equations. Boundary and initial value problems for equations of hyperbolic and parabolic type in two independent variables. Classical approaches employed.
RESTRICTIONS: Requires permission of instructor.

MATH 836 PARTIAL DIFFERENTIAL EQUATIONS II 3
PREREQ: MATH 835 and MATH 805.

MATH 838 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS 3
PREREQ: MATH 835.

MATH 839 TOPICS IN NUMERICAL ANALYSIS AND SCIENTIFIC COMPUTING 3
Topics in numerical analysis and scientific computing, such as numerical linear algebra, optimization, and scientific computing software.
RESTRICTIONS: Requires permission of instructor.

MATH 840 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS I 3
PREREQ: MATH 835.

MATH 841 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS II 3
PREREQ: MATH 835.

MATH 842 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS III 3
PREREQ: MATH 835.

MATH 843 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS IV 3
PREREQ: MATH 835.

MATH 844 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS V 3
PREREQ: MATH 835.

MATH 845 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS VI 3
PREREQ: MATH 835.

MATH 846 NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS VII 3
PREREQ: MATH 835.
MED 845 GROUP THEORY WITH APPLICATIONS 3
Groups acting on sets, the class equation, Sylow's theorems, free groups, classical
groups, Polya enumeration theory, groups and graphs, Frieze groups and crystallo-
graphic groups, and the group Knapsack problem
PREREQ: MATH650

MED 846 FIELD THEORY WITH APPLICATIONS 3
Field extensions, structure of finite fields, and basis of Galois theory. Applications of
finite fields to block designs and finite geometries. Additional applications may include
impulse response sequences, pseudorandom sequences, algebraic coding theory (BCH
and Goppa codes) and cryptosystems
PREREQ: MATH650, MATH672, and MATH845

MED 850 FOUNDATION OF PROBABILITY THEORY 3
Mathematically rigorous treatment of the foundations of probability theory. Families of
sets, semirings and sigma algebras, axioms of probability, and extension theorem.
Random variables, probability distributions, and modes of convergence for sequences of
random variables. Product measure and independence and conditional expectation The
weak and strong laws of large numbers, the central limit theorem and the law of the iter-
ated logarithm
PREREQ: MATH630 and MATH805

MED 868 RESEARCH 1-6
MED 869 MASTER'S THESIS 1-6
MED 870 READING IN MATHEMATICS 1-6

MED 884 FINITE GEOMETRIES AND DESIGNS 3
Classical projective and affine spaces, nondegenerate planes, coordinate systems,
spreads and packings, conics and unital, collineation groups and Singer cycles Further
topics chosen from related geometrical designs, associated codes and algebraic sur-
faces/varieties
PREREQ: MATH688 and MATH845

MED 885 EXTERNAL COMBINATIONS 3
Topics from extremal graph theory, extremal set theory and combinatorial geometry.
Methods used will be algebraic, geometric and probabilistic
PREREQ: MATH688 and MATH689

MED 888 TOPICS IN ALGEBRA AND COMBINATORICS 3
Advanced topics from algebra and number theory, designs, finite geometries, codes,
cryptography, graph theory, discrete optimization, algorithms and complexity.
RESTRICTIONS: Requires permission of instructor

MED 964 PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examina-
tions for doctoral students before admission to candidacy but after completion of all
required course work
RESTRICTIONS: Not open to students who have been admitted to candidacy

MED 969 DOCTORAL DISSERTATION 1-12 PF

MEDICAL TECHNOLOGY

MEDT 100 INTRODUCTION TO MEDICAL TECHNOLOGY 1 PF
Orientation to profession of Medical Technology

MEDT 366 INDEPENDENT STUDY 1-6

MEDT 370 PHLEBOTOMY PRACTICUM 1
Introduction to the theory and performance of phlebotomy. Supervised clinical experience
in the application of laboratory theory and techniques in phlebotomy
RESTRICTIONS: Open to Medical Technology majors only

MEDT 372 DIAGNOSTIC PARASITOLOGY 2
Study of human parasites, emphasizing detection and identification of diagnostic forms.
RESTRICTIONS: Open to Medical Technology majors only

MEDT 374 INTRODUCTION TO CLINICAL CHEMISTRY 1
Introduction to laboratory principles and mathematics, laboratory safety, quality control,
quality assurance and spectrophotometry
RESTRICTIONS: Open to Medical Technology majors only

MEDT 376 CLINICAL VIROLOGY AND IMMUNOLOGY 2
Fundamentals of diagnostic virology, chlamydiology and serology, including theory, dis-
ease correlation, laboratory techniques and safety
RESTRICTIONS: Open to Medical Technology majors only

MEDT 378 CLINICAL LABORATORY COMPUTER APPLICATIONS 2
Introduction to the use and application of computers in the clinical laboratory
RESTRICTIONS: Open to Medical Technology majors only

MEDT 400 URINALYSIS AND BODY FLUIDS 2
The study of routine urinalysis examination, renal function and body fluid testing procedures.
RESTRICTIONS: Open to Medical Technology majors only

MEDT 401 CLINICAL PHYSIOLOGICAL CHEMISTRY I 3
Application and theory of manuals and automated techniques used in diagnostic and ther-
apeutic medicine. Emphasis on clinical procedures for carbohydrates, proteins, lipids,
nonprotein nitrogenous compounds, blood gases and pH, and electrolytes
RESTRICTIONS: Open to Medical Technology majors only

MEDT 403 CLINICAL PHYSIOLOGICAL CHEMISTRY II 4
Application and theory of methodologies in enzymology, endocrinology and toxicology.
Relationship of normal and abnormal laboratory findings in organ functional tests
PREREQ: MEDT401

MEDT 404 HEMATOLOGY I 2
Quantitative and qualitative study of the formed elements of the blood with emphasis on the
normal state, as well as the study of normal and abnormal coagulation and hematosis
RESTRICTIONS: Open to Medical Technology majors only

MEDT 405 HEMATOLOGY II 2
Study of the pathophysiology of erythrocytic and leukocytic disorders and the laboratory
findings of these disorders
PREREQ: MEDT404

MEDT 406 MEDICAL MICROBIOLOGY 3
Study of the occurrence and pathogenesis of human infections and microorganisms asso-
ciated with humans in health and disease.
RESTRICTIONS: Open to Medical Technology majors only

MEDT 409 IMMUNOHEMATOLOGY I 1
Study of antigen and antibody systems of human red cells and compatibility testing of
blood for transfusion
RESTRICTIONS: Open to Medical Technology majors only

MEDT 410 PRINCIPLES OF MEDICAL TECHNOLOGY EDUCATION 1
Educational principles and procedures applicable to teaching clinical laboratory sciences.
Topics include preparation of educational objectives, testing and measurement, and use of
audiovisual materials

MEDT 411 CLINICAL PHYSIOLOGICAL CHEMISTRY LABORATORY I 2
Laboratory exercises that complement the topics covered in MEDT401
COREQ: MEDT401

MEDT 413 CLINICAL PHYSIOLOGICAL CHEMISTRY LABORATORY II 2
Laboratory exercises that complement the topics covered in MEDT403
COREQ: MEDT403

MEDT 414 HEMATOLOGY I LABORATORY 1
Study and implementation of laboratory procedures that correlate with the material taught
in MEDT404
COREQ: MEDT404

MEDT 415 HEMATOLOGY II LABORATORY 2
Study and implementation of laboratory procedures in hematology consistent with the
material taught in MEDT405
COREQ: MEDT405

MEDT 416 MEDICAL MICROBIOLOGY LABORATORY 2
Laboratory study of microorganisms important in the normal flora and infectious diseases
of humans
COREQ: MEDT406

MEDT 418 MEDICAL TECHNOLOGY SENIOR SEMINAR 0 PF
Readings, case studies, career planning and orientation for clinical education
RESTRICTIONS: Requires Senior and major status

MEDT 419 IMMUNOHEMATOLOGY I LABORATORY 1
Laboratory procedures consistent with MEDT409
COREQ: MEDT409

MEDT 420 IMMUNOHEMATOLOGY II 1
Study of blood and component transfusions, their risks, complications and quality assur-
ance. Also blood component therapy and testing of the neonate and adult
PREREQ: MEDT409

MEDT 421 IMMUNOHEMATOLOGY II LABORATORY 1
Laboratory procedures consistent with MEDT420
COREQ: MEDT420

MEDT 430 DIAGNOSTIC BACTERIOLOGY AND MEDICAL MYCIOLOGY 2
Diagnostic bacteriology, emphasizing the correlation of in vitro and in vivo findings in the
diagnosis and treatment of infectious diseases, including human mycoses. Identification of
pathogenic and nonpathogenic bacteria and fungi in clinical specimens
PREREQ: MEDT406 and MEDT416
COREQ: MEDT431
MEDICAL TECHNOLOGY

MEDT 431 Diagnostic Bacteriology and Medical Mycology Laboratory 2
Study and implementation of laboratory procedures that correlate with the material taught in MEDT430
COREQ: MEDT430

MEDT 461 Management Topics in Medical Technology 1
Introduction to clinical laboratory management with emphasis placed on management styles, information management, technology and materials management, and human resources management.
RESTRICTIONS: Open to Medical Technology majors only

MEDT 466 Independent Study 1-6

MEDT 471 Clinical Laboratory Management Seminar 1
Discussion of laboratory management areas as they relate to the employer and employees. Emphasis on communication, motivation, interviewing, staffing, job descriptions, government regulations and capital budgeting as they relate to the medical technologist and laboratory.

MEDT 472 Clinical Urinalysis and Serology Practicum 1 PF
Clinical experience in the application of laboratory theory and techniques in urinalysis and serology.
PREREQ: MEDT376 and MEDT400

MEDT 473 Clinical Chemistry Practicum 3 PF
Supervised experience in the application of laboratory theory and techniques in clinical chemistry.
PREREQ: MEDT403 and MEDT413

MEDT 475 Clinical Hematology Practicum 3 PF
Supervised experience in the application of laboratory procedures in hematology.
PREREQ: MEDT405 and MEDT415

MEDT 477 Clinical Microbiology Practicum 3 PF
Supervised experience in the application of laboratory procedures in diagnostic microbiology.
PREREQ: MEDT430 and MEDT431

MEDT 479 Clinical Immunohematology Practicum 3 PF
Supervised experience in the application of laboratory procedures in immunohematology.
PREREQ: MEDT420 and MEDT421

MECHANICAL ENGINEERING

MEEG 101 Introduction to Mechanical Engineering 3
Introduces the mechanical engineering profession. Uses a team design project to illustrate the engineering design process. Introduces computational tools.

MEEG 112 Statics 3
To recognize, idealize and solve problems involving rigid bodies in static equilibrium using scalar and vector techniques. Introduces free body diagrams, theory of stress, and work-energy principles. Emphasizes the role of statics in the design process.
COREQ: MATH242 and PHYS207

MEEG 202 Computer-Aided Engineering Design Laboratory 3
Introduces the student to computer-aided mechanical engineering by developing the student's ability to 1) think visually, 2) communicate spatial information to an engineering audience through parametric solid modeling drafting standards, and 3) begin to recognize the connection between a virtual design and an actual component.
PREREQ: MEEG101

MEEG 211 Dynamics 3
Intermediate-level development of the kinematics and dynamics of particle systems and rigid bodies. Solution of engineering problems by force, momentum and energy methods with applications to mechanisms, machines, and vehicles. Computer programs.
PREREQ: MEEG112 and PHYS207

MEEG 215 Mechanics of Solids 4
Analytical study of stress and deformation and their application to the design of machine and structural elements under axial, torsional, bending and lateral loads. Buckling and energy methods will also be discussed.
PREREQ: MEEG112

MEEG 301 Machine Design-Kinematics & Kinetics 3
Kinematic analysis of mechanisms and machines, kinematic synthesis, cam design, gear train analysis and machine dynamics.
PREREQ: MEEG211

MEEG 304 Machine Design-Elements 3
Aspects of machine design: statistical nature, theories of failure and design for strength and design of machine elements.
PREREQ: MEEG215
RESTRICTIONS: Open to majors only.

MEEG 307 Thermodynamics I 3
Basic concepts of thermodynamics including properties of substances, first and second law analysis of systems and control volumes, entropy and availability. Power and refrigeration cycles.
PREREQ: MATH302.

MEEG 311 Vibration and Control 4

MEEG 321 Materials Engineering 3
Mechanical properties and materials behavior under static and dynamic loading; fatigue, creep, wear and corrosion; properties and applications of metals, ceramics, polymers and composites; forming and joining of materials; practical examples of materials selection in design and the use of materials data bases.
PREREQ: MASC302.

MEEG 331 Incompressible Fluids 4
Incompressible fluid mechanics: fluid statics, control volume analysis for mass, momentum and energy; differential analysis of viscous and inviscid flow; dimensional analysis; experiments in fluid mechanics.
PREREQ: MEEG112 and MATH351
RESTRICTIONS: Open to majors only

MEEG 332 Compressible Fluids 3
PREREQ: MEEG331.

MEEG 342 Heat Transfer 3
PREREQ: PHYS210.

MEEG 344 Thermodynamics 3
PREREQ: PHYS210.

MEEG 346 Thermal Lab 1
Introduction to experimental and measurement techniques related to thermodynamics and heat transfer. Designed to complement that in MEEG342 and 344.
PREREQ: PHYS210 and PHYS345
COREQ: MEEG342 and MEEG344.

MEEG 361 Applied Engineering Analysis 3
Linear algebra; vector field theory; Fourier series and partial differential equations. Engineering applications.
PREREQ: MATH302.

MEEG 366 Independent Study 1-6

MEEG 408 Power Generation System Design 3
Design and optimization of fossil fuel and nuclear power plants, cogeneration and peak-shaving systems. Numerical solution combustion problems and thermal balance. Renewable energy, economics and environmental impacts.
PREREQ: MEEG344.

MEEG 411 Structural Mechanics for Mechanical and Aerospace Engineering 3
Introduction to theory of plates and shells, including analysis of stresses and deformations, vibrations, stability and thermal response of structures typical of modern aerospace and underwater vehicles, pressure vessels and other continuous structures.
PREREQ: MEEG211 and MEEG215.

MEEG 413 Advanced Mechanics of Materials 3
Intermediate topics in the mechanics of deformable media with applications to the analysis and design of machine elements and structures. Inelastic material response and failure analysis will also be discussed.
PREREQ: MEEG215 and MATH352.

MEEG 415 Finite Element Analysis 3
Introduction to the finite element method with applications to structural engineering problems. Direct and variational approaches to element formulation; interpolation functions and isoparametric elements.
PREREQ: MEEG215.
MEEG 427 System Dynamics 3
Introduction to modeling, analysis and control of dynamic systems of mechanical, electrical, electromechanical, thermal and hydraulic nature. Introduction to mechanical vibration analysis, analytical and computer methods for linear systems, transfer functions, feedback controls, stability analysis, and design methods.

PREREQ: MEEG214, MATH352, and MEEG361

MEEG 432 Aerodynamics 3

PREREQ: MEEG 331

MEEG 433 Bioengineering Fluids and Transport 3
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal and synovial systems. Application of fluid, heat and mass transport fundamentals to analysis of these biological systems.

PREREQ: MEEG332 and MEEG342

MEEG 434 Air Pollution Processes 3
Physical, chemical, and meteorological processes that govern the photochemistry and transport of gas-phase and aerosol-phase air pollutants in the atmosphere. Topics to be covered include air quality, pollutant emissions, gas-phase and liquid-phase chemistry, aerosol dynamics, plumes, turbulent transport in geophysical flows, meteorology, and deposition.

RESTRICTIONS: Requires upper division status in Engineering

MEEG 438 Air Pollution Control 3
Sources, characteristics and effects of air pollutants. Emphasis on gas cleaning operations for removal of particulate matter, gases and vapors. Design of control processes such as scrubbers, electrostatic precipitators, vapor incinerators, adsorption, absorption and others.

PREREQ: MEEG331, CIEG233 and CHEG325

MEEG 445 Senior Research I 3
Investigation of an experimental nature to be carried out and reported upon by each student.

RESTRICTIONS: Open to Seniors only

MEEG 446 Senior Research II 3
Investigation of an experimental nature to be carried out and reported upon by each student.

RESTRICTIONS: Open to Seniors only

MEEG 447 Design and Systems Synthesis I 3
Design and Systems Synthesis is a year-long sequence. In Fall, teams select a project, discover customer's wants, benchmark best practices for each desired function, generate design concepts and select the best. In Spring, teams build a prototype, test it, and improve their designs.

MEEG 448 Design and Systems Synthesis II 3
Design and Systems Synthesis is a year-long sequence. In Fall, teams select a project, discover customer's wants, benchmark best practices for each desired function, generate design concepts and select the best. In Spring, teams build a prototype, test it, and improve their designs.

PREREQ: MEEG447

MEEG 466 Independent Study 1-6
Overview of numerical modeling of continuum mechanics. Case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of commercial codes.

MEEG 615 Mechanical Properties of Materials 3
See MASC615 for course description.

MEEG 616 Composite Materials Structures 3
Introduction to composite materials, anisotropic elasticity and laminate theory; plates and panels of composite materials; beams, columns and rods; composite material shell structures; energy methods; strength and failure theories; adhesive bonding and mechanical fastening; hygrothermal effects; stress analysis, buckling, vibrations and impact.

MEEG 620 Intermediate Dynamics 3
Reference frames, angular velocity, linear velocity, angular acceleration, linear acceleration, multibody systems, inertia properties, kinetic energy, equations of motion, generalization of d'Alembert's principles, numerical integration, computer simulation.

MEEG 621 Optimization of Dynamic Systems 3
Static optimization, numerical methods for static optimization, calculus of variations. Dynamic optimization: basic results, direct solution, indirect solution. Linear systems: finite time optimal control, steady state optimal control, multi-degree-of-freedom mechanical systems.

RESTRICTIONS: Undergraduates require permission of instructor

MEEG 622 Nonlinear Dynamics and Chaos 3
Nonlinear dynamics and chaotic phenomenon as applied to natural and engineering systems. Geometric and computational techniques, analytical methods for the qualitative analysis of dynamical systems modeled by differential equations and iterated maps. Planar and non-planar phase space analysis, local and global bifurcation analysis, catastrophes, resonances.

PREREQ: MATH351

MEEG 626 Random Vibration 3
See CIEG616 for course description.

MEEG 630 Intermediate Fluid Mechanics 3

MEEG 633 Bioengineering Fluids and Transport 3
Anatomy and physiology of pulmonary, cardiac, genitourinary, cerebrospinal and synovial systems. Applications of fluid, heat and mass transport fundamentals to analysis of these biological systems.

MEEG 634 Air Pollution Processes 3
Physical, chemical, and meteorological processes that govern the photochemistry and transport of gas-phase and aerosol-phase air pollutants in the atmosphere. Topics to be covered include air quality, pollutant emissions, gas-phase and liquid-phase chemistry, aerosol dynamics, plumes, turbulent transport in geophysical flows, meteorology, and deposition.

RESTRICTIONS: Requires graduate standing in Engineering

MEEG 636 Fluid Mechanics Measurements 3
Point-wise velocity measurement including differential pressure measurement, hot-wire anemometry, and Laser-Doppler anemometry. Global measurement techniques based on particle imaging and digital image processing. Signal processing, statistics and uncertainty analysis.

MEEG 640 Intermediate Heat Transfer 3
Theory and equations of heat conduction, boundary conditions, steady and transient heat conduction, theory of convection, forced convection in laminar flows, derivation of conservation equations, numerical methods.

MEEG 652 Flow of Viscous Materials 3
Applied fluid dynamics with an emphasis on flow processes dominated by viscous effects. Flow phenomena in polymeric, ceramic and composite materials. Modeling of flows in processing and manufacturing and its application to the design of molds and machinery.

MEEG 653 Manufacturing Processes 3
Comprehensive view of many manufacturing processes, concepts and technologies. Processes include: packaging, plastic molding, food, pharmaceutical, metal cutting and forming. Concepts and technologies include: robotics, numerical control, just-in-time inventory, ergonomics, material handling, quality management and more.
MEEG 663 Computer-Aided Design 3
Essentials of computer-aided design for engineers: specific topics include theory and application of computer graphics, introduction to data structures, numerical methods for curve and surface fitting and generation, and solid modeling
PREREQ: MATH352

MEEG 681 Computer Solutions of Engineering Problems 3
Overview of numerical modelling in continuum mechanics: case studies in fluid and solid mechanics using commercially available software packages. Overview of common features, capabilities and limitations of commercial codes

MEEG 690 Intermediate Engineering Mathematics 3

MEEG 691 Advanced Engineering Mathematics 3
Integral transform and Green's Function Solution of Partial Differential Equations, complex variables, variational calculus and introduction to perturbation methods
PREREQ: MEEG610

MEEG 801 Advanced Thermodynamics 3
Critical examination of thermodynamic principles, equations of state for liquids, gases and mixtures. Interpretation of thermodynamic functions and applications to processes, reactions and equilibrium states

MEEG 803 Convection Heat Transfer 3
Forced convection heat transfer in laminar and turbulent boundary layers including viscous dissipation effects. Forced convection to fluids flowing through channels. Free convection, condensation and evaporation in boundary layers
PREREQ: MATH352

MEEG 805 Special Topics in Thermodynamics 3
Selection of topics that may include thermodynamics of irreversible processes, statistical mechanics, nonequilibrium statistical mechanics, thermodynamics of materials with memory, etc.

MEEG 811 Sandwich Structures 3
Composite and isotropic sandwich structures are studied for stresses, deformations, buckling loads, natural frequencies and dynamic response under mechanical and environmental loads, involving honycomb, solid, foam, web and truss core sandwich comprising beam, plate, ring and shell structures. Design and minimum weight optimization are treated.

MEEG 812 Advanced Continuum Fracture Mechanics 3
PREREQ: MEEG610 or MEEG813

MEEG 813 Theory of Elasticity 3
Index notation. Concepts of stress and strain. Equations of equilibrium and compatibility and elastic constitutive response. Applications to problems in applied mechanics

MEEG 814 Theory of Plasticity 3

MEEG 816 Advanced Continuum Mechanics 3
A rigorous study of kinematics of finite deformation and the field equations of mechanics and thermodynamics of continua. Tensor analysis employed throughout
PREREQ: MEEG813

MEEG 817 Composite Materials 3
Introduction, thermoelastic behavior of laminated composites, statistical strength theories of continuous fiber composites, short fiber composites, hybrid composites, two-dimensional textile structural composites, three-dimensional textile structural composites, flexible composites, and nonlinear elastic finite deformation of flexible composites. May be crosslisted with MASC317
PREREQ: MEEG813

MEEG 818 Plates and Shells in Aerospace Structures I 3
PREREQ: MEEG813

MEEG 819 Plates and Shells in Aerospace Structures II 3
General theory of thin shells from three-dimensional equations of elasticity. Shells of revolution under axially symmetric loads; asymmetric loads; theromelastic effects; general bending theory, membrane theory, inextensional theory. Donnell equations; edge load solutions; orthotropic shells; laminated shells
PREREQ: MEEG813

MEEG 821 Advanced Dynamics 3
General principles of spatial dynamics Lagrangian and Hamiltonian methods. Application to engineering problems

MEEG 823 Vibration Analysis 3
Engineering analysis of the vibrations of machines and structures. Free, forced and random vibrations with emphasis on linear, multidegrefee of freedom systems by matrix and energy methods. Introduction to the Lagrangian and method of coordinate analysis of complex systems

MEEG 824 Structural Dynamics and Control 3
Reviews vibration analysis of uniform/composite beams, plates and shells introduces analysis of structural sound radiation into enclosures and open field. Structural vibration controls and feedback strategies including modal, natural and optimal controls and uniform damping. Reduction of structural sound radiation by adaptive feedforward structural controls
PREREQ: MEEG821, MEEG831 and MATH352

MEEG 825 Dynamic Behavior of Materials 3
Importance and historical development of stress waves in solids. 1D stress waves, Hugoniot elastic limit; longitudinal and shear waves, reflection and refraction; Ryleigh, Love, and Stoneley waves; wave guides; spherical waves, Lamb's problem, elastic unloading; inelastic waves and shock waves; dynamic fracture and shear banding of solids; wave propagation in anisotropic media; high speed experimental techniques
PREREQ: MEEG610 or MEEG813

MEEG 830 Special Topics in Fluid Mechanics 3
Offered occasionally and with varying subject matter. Topics may include turbulence, plasma kinetic theory, stability, etc.

MEEG 831 Fluid Dynamics 3
Physical properties of fluids, description of motion, vector and tensor analysis, Navier-Stokes equations, kinematic theory of gases, incompressible viscous flows, boundary-layer theory and turbulence
PREREQ: MATH352

MEEG 832 Fluid Dynamics II 3
Rotational and irrotational flows, potential theory, airfoils, creeping motion, lubrication theory, wave motion, compressibility, supersonic flow and shock waves, and hydrodynamic stability

MEEG 840 Special Topics in Continuum Mechanics 3
Study of advanced principles of continuum mechanics in one or more special fields. Topics selected by instructor. Special subjects may include the general theory of constitutive equations, hyperelasticity, electroelasticity, hypoelasticity, simple and nonsimple fluids, and solutions of special problems in these areas

MEEG 853 Polymer Fluid Mechanics 3
Development and application of constitutive equation to describe flow of polymeric liquids

MEEG 862 Advanced Engineering Analysis 3
Emphasis on asymptotic and perturbation methods. Topics from among the following: steepest descent and stationary phase; phase plane; asymptotic analysis of ODEs and PDEs using such methods as WKB, matched asymptotic expansions, Padé approximants, strained, and multiple scales; similarity methods; catastrophe theory; and chaos. Engineering applications

MEEG 863 Engineering Analysis II 3
N-space, eigenvalue problem, diagonalization and quadratic forms; field theory; Sturm-Liouville theory; integral transforms; Bessel and Legendre functions; and partial differential equations. Engineering applications

MEEG 868 Research 1-9

MEEG 869 Master's Thesis 1-6
Experimental investigation conducted for the purpose of contributing new useful data and theory in some field of mechanical engineering. Although supervised, investigation will be independent in character to encourage development of initiative

MEEG 964 Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work
RESTRICTIONS: Not open to students who have been admitted to candidacy

MEEG 969 Doctoral Dissertation 1-12 PF
MLSC 105 INTRODUCTION TO LEADERSHIP I 1
Introduction to leadership principles using case studies, historical perspectives and hands-on leadership opportunities. Learn to rappel, use a map and compass, understand the basics of physical fitness and familiarize with Army traditions and ceremonies. No military obligation associated with this course.

MLSC 106 INTRODUCTION TO LEADERSHIP II 1
Continues to build on the basics of MLSC105. Provides additional leadership opportunities and expands upon leadership theory. Learn basic rifl Marksmanship, develop public presentation abilities and continue physical fitness development. No military obligation associated with this course.

MLSC 205 BASIC LEADERSHIP I 1
Enhances understanding of human behavior, leadership techniques and management and planning structures. Builds leadership competencies through leadership opportunities with structured evaluations and feedback. Learn about the various branches and job opportunities in the Army. No military obligation associated with this course.

MLSC 206 BASIC LEADERSHIP II 1
Continues to build on the basics of MLSC205. Learn small unit tactics, how to handle up to ten people in stressful situations with feedback on performance. Further develop skills with map and compass, weapons safety and emergency first aid techniques for basic life saving. No military obligation associated with this course.

MLSC 215 LEADER DEVELOPMENT 4
An introductory six week off-campus, hands-on leadership education and assessment course. Real life individual and collective leadership challenges and opportunities. All expenses paid. Multiple scholarship opportunities.

RESTRICTIONS: Permission of instructor required.

MLSC 305 APPLIED LEADERSHIP I 2
Advanced training in military leadership. One of two courses designed to prepare cadets for the ROTC Basic Camp/Summer Training Program. Focuses on leadership development through multiple, small unit leadership opportunities and counseling. Fine tunes skills learned in the previous two years of Military Science, ROTC Basic Camp or prior military service, especially marksmanship, land navigation, drill and ceremonies and physical fitness. Commitment to military service required.

RESTRICTIONS: Requires permission of instructor.

MLSC 306 APPLIED LEADERSHIP II 2
Continues to build on the basics of MLSC305. Completes preparation for Advanced Camp/Nurse Summer Training Program and focuses on leadership at the platoon and company level. Small unit tactics and training are emphasized. Information is provided to help the student make wise decisions about military service options. Commitment to military service required.

PREREQ: MLSC305.

MLSC 315 LEADER EVALUATION 4
An advanced six week off-campus, hands-on leadership education and assessment course. Real life individual and collective leadership challenges and opportunities. All expenses paid.

PREREQ: MLSC305 and MLSC306.

RESTRICTIONS: Requires permission of instructor.

MLSC 316 NURSING LEADERSHIP 4
An advanced seven week off-campus, hands-on leadership training and assessment course, specializing in nursing skills. Two weeks are spent in an Army education scenario then five weeks as a Junior Nurse in an Army hospital/medical center. All expenses paid.

PREREQ: MLSC305 and MLSC306.

RESTRICTIONS: Requires permission of instructor.

MLSC 365 MILITARY HISTORY STUDIES 3
Selected topics in American Military History, current military trends and future military requirements.

MLSC 366 INDEPENDENT STUDY 1-3

MLSC 405 ADVANCED LEADERSHIP I 2
Designed to prepare cadets for commissioning by refining professional skills and leadership ability. Students assigned leadership positions and function as commanders and staff officers in planning and executing cadet battalion activities. Focuses on technical skills needed to accomplish assigned missions and other topics which expand cadet knowledge of Army systems and procedures. Commitment to military service required.

PREREQ: MLSC306.

MLSC 406 ADVANCED LEADERSHIP II 2
Builds on leadership skills from MLSC405 and helps complete the transition from cadet to lieutenant. Cadets are assigned new leadership positions to broaden their leadership experience. Focuses on officer professional development subjects needed to manage a military career and personal affairs. Commitment to military service required.

PREREQ: MLSC306.

MLSC 466 INDEPENDENT STUDY 1-3

MUSEUM STUDIES

MSST 205 SCIENCE AND THE DETECTION OF ART FORGERIES 3
Concepts from many scientific disciplines are useful for interpreting works of art. Analytical techniques based on those concepts often reveal art forgeries. Case studies will use basic scientific principles to investigate a wide variety of known or alleged art forgeries. May be cross-listed with ARTH405.

MSST 403 HISTORY, PHILOSOPHY, FUNCTIONS AND FUTURE OF MUSEUMS 3
Introduction to philosophy, purposes, structure, historical development and future of museums, and botanical and zoological gardens. Examines functions of collection, conservation, research, exhibition/interpretation, and social/cultural services; museum field growth. May be cross-listed with ARTH403 and/or HIST403.

MSST 408 PUBLIC HISTORY: RESOURCES, RESEARCH AND PRACTICE 3
See HIST408 for course description.

MSST 444 TECHNOLOGY OF CULTURAL MATERIALS: CERAMICS AND GLASS 3
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ARTH444 and/or ARTC444.

MSST 445 TECHNOLOGY OF CULTURAL MATERIALS: METALS 3
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ARTH445 and/or ARTC445.

MSST 464 MUSEUM STUDIES INTERNSHIP 3
Internship practicum supplementing theoretical and methodological background in administration, collections management, exhibition, research, interpretation, and public programming and services of museums. Students spend a minimum of ten full weeks, or equivalent, at the University Gallery, Longwood Gardens, Hagley Museum, Winterthur, or another acceptable museum, related institution or organization in the United States.

PREREQ: MSST403.

MSST 480 STUDY IN THE MATERIALS AND TECHNIQUES OF DRAWING IN THE WEST 3
Lecture-studio presentation on materials and tools, supports and techniques of wet and dry media drawing in the West from about the year 1400 to the present. Topics include the development and manufacture of paper, pens, brushes, inks, watercolor paint, charcoal, metal points, graphite pencils, natural and fabricated chalks, crayons, pastels, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ART 425, ARTC480 and/or ARTH480.

RESTRICTIONS: Requires permission of instructor.

MSST 485 COLOR MIXING AND MATCHING 3
Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors without instrumentation. Pigments, dyes and the manufacture of paint studied. Major topics include color interaction and the Munsell system of color description. May be cross-listed with ART 426 and/or ARTC485.

RESTRICTIONS: Requires permission of instructor.

MSST 488 STUDIO MATERIALS AND TECHNIQUES OF PAINTING I 3
Major materials including tools, supports and techniques of architectural painting, manuscript illumination and panel painting in encaustic, watercolor, and egg tempera from about 1500 BC to AD 1500. Major topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ART 427, ARTC488 and/or ARTH488.

RESTRICTIONS: Requires permission of instructor.

MSST 489 STUDIO MATERIALS AND TECHNIQUES OF PAINTING II 3
Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: 1500-1900. Major topics include the development of canvas, brushes, oil paint, mediums, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks, lectures and library research. May be cross-listed with ART 426, ARTC489 and/or ARTH489.

RESTRICTIONS: Requires permission of instructor.

MSST 490 STUDIO IN THE MATERIALS AND TECHNIQUES OF PRINTMAKING I 3
Major masters and the materials, tools, and techniques of relief, planographic and intaglio printmaking. Time frame: ca 1400-1920. Major topics include woodcut, copperplate engraving, etching, drypoint, aquatint, mezzotint, lithograph and wood engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART 429, ARTC490 and/or ARTH490.

RESTRICTIONS: Requires permission of instructor.

MSST 605 HISTORY OF THEORIES IN MATERIAL CULTURE 3
See EMAC605 for course description.
MUSEUM STUDIES

MSST 606 Issues in American Material Culture 3
See EAMC606 for course description
RESTRICTIONS: Requires permission of instructor

MSST 608 Public History: Resources, Research, and Practice 3
See HIS608 for course description

MSST 629 Seminar in Historic Preservation 3
See UAPP629 for course description

MSST 644 Technology of Cultural Materials: Ceramics and Glass 3
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic ceramic and glass objects from the point of view of technology, aesthetics and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH644 and/or ARTC644

MSST 645 Technology of Cultural Materials: Metals 3
Nature of raw materials, processing methods, chemistry and structure of finished products, deterioration mechanisms and effects, scientific methods of analysis, and case studies of ancient and historic metal objects from the point of view of technology, aesthetics, and function. Case studies from a wide variety of cultural traditions. May be cross-listed with ANTH645 and/or ARTC645

MSST 680 Studio in the Materials and Techniques of Drawing in the West 3
Lecture-studio presentation on materials and tools, supports and techniques of wet and dry media drawing in the West from about the year 1400 to the present. Topics include: development and manufacture of paper, pens, brushes, inks, watercolor paint, charcoal, metal points, graphite pencils, natural and fabricated chalks, crayons, pastels, erasers and fixatives. Studio reconstructions of masterworks, lectures and library research. May be cross-listed with ART 682, ARTC680 and/or ARTH680
RESTRICTIONS: Requires permission of instructor

MSST 681 Materials and Techniques of the Contemporary Painter and Draftsman 3
Twentieth-century artist's materials. Topics: acrylic emulsion and acrylic solution alkyd resin, PVA paints: collage-assemblage; solvent-transfer; synthetic fiber canvas, paper, panels, oil pastels, point sticks, felttip markers, colored inks and pens: airbrush spray gun; and non-art materials. Potential health hazards. Conservation topics: pH, lightfastness, adhesion and storage environments. May be cross-listed with ART 681, ARTC681 and/or ARTH681

MSST 685 Color Mixing and Matching 3
Lecture-studio presentation covering analytical and practical aspects of mixing and matching colors without instrumentation. Pigments, dyes and the manufacture of paint studied. Major topics include color interaction, and the Munsell system of color description. May be cross-listed with ART 685 and/or ARTC685
RESTRICTIONS: Requires permission of instructor

MSST 688 Studio Materials and Techniques of Painting I 3
Major materials including tools, supports and techniques of architectural painting, manuscript illumination and panel painting in encaustic, watercolor, and egg tempera from about 1500 BC to AD 1500. Major topics include true fresco and egg tempera painting. Studio reconstructions, lectures and library research. May be cross-listed with ART 688, ARTC688 and/or ARTH688
RESTRICTIONS: Requires permission of instructor

MSST 689 Studio Materials and Techniques of Painting II 3
Major masters and the materials, tools and techniques of indirect and direct oil painting. Time frame: 1500-1900. Major topics include the development of canvas, brushes, oil paint, medium, varnishes, solvents and the complex relationship between indirect and direct techniques. Includes studio reconstruction of masterworks, lectures and library research. May be cross-listed with ART 689, ARTC689 and/or ARTH689
RESTRICTIONS: Requires permission of instructor

MSST 690 Studio in the Materials and Techniques of Printmaking I 3
Major masters and the materials, tools, and techniques of relief, planographic and intaglio printmaking. Time frame: ca. 1400-1920. Major topics include woodcut, copperplate engraving, etching, drypoint, mezzotint, lithograph and wood engraving. Studio reconstructions, lectures and library research. May be cross-listed with ART 690, ARTC690 and/or ARTH690
RESTRICTIONS: Requires permission of instructor

MSST 801 Museum Curatorship: Collections Management 3
A course on collections management theory and practices that focuses on the administration, handling, physical care, recording and study of museum collections. Combines classroom instruction, demonstrations and field trips with "hands on" projects in the University Gallery and other area museums
RESTRICTIONS: Open to graduate students only

MSST 802 Leadership and Management of Museums 3
Treats governance and administrative operations of museums, highlighting planning, legal and organizational structure, trustees and directors, personnel management, finance, development, marketing, merchandising, maintenance and security, libraries and archives, publishing, computer applications, public programming, and professional standards and ethics
RESTRICTIONS: Open to graduate students only. Includes field trips and team task force projects

MSST 804 Museum Internship 3
Internship practice in administration, collections management, exhibition and interpretation at museums and related institutions. Students spend ten full weeks, or the equivalent, at the University Gallery, Winterthur Museum, Hagley Museum, Longwood Gardens or other acceptable institution. May be cross-listed with HIST804
RESTRICTIONS: Open to graduate students only. Requires at least one semester course in Museum Studies and permission of instructor

MSST 805 Historical Properties 3
Administrative and interpretation of historical properties, including historic site surveys, preservation research, building restoration, conservation techniques and the establishment and attainment of interpretive objectives. Field trips to area historic sites. Combines classroom instruction and work projects at area historic sites
RESTRICTIONS: Open to graduate students only

MSST 807 Museum Curatorship: Temporary and Economical Exhibits 3
Focuses on planning, designing and fabrication of economical museum exhibits for changing exhibition rooms and alternative spaces. Emphasizes time-, money- and labor-saving techniques. Students design and produce a temporary exhibit in the University Gallery or in a local museum
RESTRICTIONS: Open to graduate students only

MSST 810 Environmental Institution Management 6
Seminar sessions at Delaware Nature Society headquarters with staff and guest lectures, including attorneys, investment counselors, University faculty and museum lecturers. Experiences at area environmental institutions. Covers goal definition, long-range planning, building/grounds management, programming, fund raising, financial management, personnel policies, volunteers, publicity and publications, legal considerations and conservation/preservation roles
RESTRICTIONS: Open to graduate students only. Permission of instructor required

MUSIC EDUCATION

MUED 179 Freshman Seminar in Music Education 1
Introduction to issues and approaches in music education. Helps students examine their own interests and aptitude for teaching while presenting discussion on current trends in the profession and attributes of successful teachers. Provides guidelines for developing student portfolios

MUED 279 Practicum in Music Education 3
Observation of differing elementary and secondary school music program structures; studies and observations of children's growth and development patterns in terms of music learning, and experience in music instructional methods
RESTRICTIONS: Requires permission of instructor

MUED 336 Choral Conducting 2
Specific problems in conducting choral literature. Comparative analysis of works to be conducted
PREREQ: MUSC335
RESTRICTIONS: For vocal music education majors

MUED 337 Instrumental Conducting 2
Specific problems in conducting instrumental literature. Practical application of conducting techniques through supervised conducting of instrumental ensembles
PREREQ: MUSC335
RESTRICTIONS: For Instrumental music education majors

MUED 366 Independent Study 1-3

MUED 379 Music in the Elementary and Junior High (or Middle) School 3
Introduction to music materials and approaches through clinical experiences
PREREQ: MUED279
COREQ: MUED337
RESTRICTIONS: For music majors
MUED 390 MUSIC IN THE ELEMENTARY SCHOOL  3
Introduction to music materials and approaches through clinical experiences
RESTRICTIONS: For elementary education and child development majors

MUED 479 SECONDARY MUSIC MATERIALS AND APPROACHES  3
Procedures and materials used for teaching music in the secondary school
PREREQ: MUED379 and MUED337
RESTRICTIONS: Requires permission of instructor

MUED 574 MUSIC CONCEPTS IN THE ELEMENTARY SCHOOL  3
Methods and materials for developing children's understanding of music concepts by involvement in listening to, performing and describing musical sound events
RESTRICTIONS: For experienced teachers.

MUSIC

MUSC 061 PRIVATE STUDY  1-8 R
RESTRICTIONS: Requires audition and departmental placement test. Credits do not apply toward bachelor's degree.

MUSC 062 PRIVATE STUDY  1-8 R
PREREQ: MUSC61
RESTRICTIONS: Credits do not apply toward bachelor's degree.

MUSC 095 BASIC HARMONY AND EAR-TRAINING  3 R
Designed to establish or re-establish basic harmony and ear-training skills
RESTRICTIONS: For beginning music majors and minors. Requires Musicality Test. Credits do not apply toward degree

MUSC 100 RECITAL ATTENDANCE  0 PF
A recital experience; see Department of Music Student Handbook for details
RESTRICTIONS: May be repeated

MUSC 101 APpreciATION OF MUSIC  3
Introduction to Western music literature through a nontechnical presentation of various musical styles and forms

MUSC 102 APpreciATION OF MUSIC  3
Music literature through a nontechnical presentation of various musical styles and forms. Continuation of MUSC101 with emphasis on the larger forms - symphonies, operas, oratorios, concertos - and the 20th century.
PREREQ: MUSC101

MUSC 103 INTRODUCTION TO OPERA  3
Explores the world of opera including categories of singers; types of operas, e.g., opera seria, opera buffa, singspiel; and the roles of the chorus. Includes experience seeing an opera performed live.

MUSC 104 INTRODUCTION TO OPERA II  3
Introduction to opera, concentrating on opera comic, singspiel, opera seria, and operetta. Baroque opera, seria, and Wagnerian music drama. Explores the relationship of music to the context of opera. Time span covered is 1607 to present.

MUSC 105 FUNDAMENTALS OF MUSIC I  3
Introduction into the elements of music theory including ear training, music reading and harmony with keyboard application
RESTRICTIONS: Designed for nonmusic majors

MUSC 106 FUNDAMENTALS OF MUSIC II  3
Continuation of MUSC105 Survey and analytical approach to music styles Composing original works for voice and instruments
PREREQ: MUSC105

MUSC 107 HISTORY OF ROCK  3
The study of various styles of rock music. Introduction to folk, country, blues, and jazz as predecessors to rock. Intended for the nonmusic major. No music reading skills required.

MUSC 108 UNIVERSITY SINGERS  1
Members enter by audition. University Singers is a chorus of sopranos and altos that performs its own concerts and also performs other choruses. Requires permission of Instructor. May be repeated for credit

MUSC 109 CHORAL UNION  1
Members enter by audition. Choral Union is a chorus of 100+ voices that rehearses on Monday nights. The Union performs large-scale choral works. Smaller sections perform independently as well.
RESTRICTIONS: Requires permission of Instructor. May be repeated for credit

MUSC 110 CHORALE  1
Members enter by audition. Chorale is the university's most select chorus of mixed voices.
RESTRICTIONS: Requires permission of Instructor. May be repeated for credit

MUSC 113 MARCHING BAND  1
RESTRICTIONS: Contact the Director for detailed information. All interested percussionists, colorguard and writers must audition. May be repeated for credit

MUSC 114 SYMPHONIC BAND  1
The ensemble performs standard concert literature as well as new compositions. During fall semester the ensemble meets one day a week and performs one full concert. The ensemble participates in the Department of Music's CALLIOPE concert
RESTRICTIONS: Requires audition and permission of the Instructor. May be repeated for credit

MUSC 115 WIND ENSEMBLE: ORCHESTRAL WINDS AND PERCUSSION  1
The Wind Ensemble is a select 45-member group of woodwinds, brass and percussion players that performs original band music, chamber music and transcriptions. The Orchestral Winds and Percussion consists of select players from the Wind Ensemble, who form various small groups and percussion sections of the University Orchestra.
RESTRICTIONS: The Wind Ensemble requires audition and may be repeated for credit
The Orchestral Winds and Percussion may be repeated for credit

MUSC 116 JAZZ ENSEMBLE  1
Study and performance of the diverse styles characteristic of the medium
RESTRICTIONS: Requires audition. May be repeated for credit

MUSC 117 UNIVERSITY ORCHESTRA  1
Rehearsal and performance of representative works for orchestra.
RESTRICTIONS: Requires audition. May be repeated for credit

MUSC 118 PERCUSSION ENSEMBLE  1
Study and performance of works for percussion instruments.
RESTRICTIONS: Requires audition. May be repeated for credit

MUSC 121 GAMELAN ENSEMBLE  1
Gamelan is the largest instrumental ensemble from Southeast Asia, and is considered the "orchestra of the Eastern world." This institute performs ensemble, dealing with traditional and contemporary Japanese and Balinese literature.
RESTRICTIONS: Open to anyone without prior musical experience. May be repeated for credit

MUSC 125 COLLEGIUM MUSICUM  1
Ensemble for the performance of instrumental and vocal music of the Medieval, Renaissance and Baroque periods. Size, instrumentation and repertoire for the group varies from semester to semester dependent upon resources at hand, player's skills and other factors.
PREREQ: Audition.

MUSC 161 PRIVATE STUDY  1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class
RESTRICTIONS: Contact department to register for correct number of credit hours. Requires audition

MUSC 162 PRIVATE STUDY  1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-contact-hour studio class
PREREQ: MUSC161
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 171 DICTION: ENGLISH AND ITALIAN  1
Study of pronunciation rules for singing in English and Italian. Includes practical
CREDITS: Enrollment in applied study.

MUSC 173 CLASS VOICE  1
Fundamentals and techniques of singing
RESTRICTIONS: For nonmajors.

MUSC 174 CLASS VOICE: BEGINNING  1
Fundamentals of singing for the nonvocal music major. Study of basic technique, repertoire and function of vocal mechanisms
RESTRICTIONS: Requires permission of Instructor for nonmajors. Requires one semester of University vocal experience.

MUSC 175 CLASS PIANO: ELEMENTAL I  1
Beginning piano primarily for the vocal or instrumental music major. Basic techniques, reading, transposition and playing by ear.
PREREQ: MUSC105 or Co-requisite of MUSC195 Preference for enrollment will be given to music majors
RESTRICTIONS: None.

MUSC 176 CLASS PIANO: ELEMENTAL II  1
A continuation of MUSC175 Scale and arpeggio playing, keyboard harmony, repertoire of pieces appropriate to technical ability
PREREQ: MUSC175 and MUSC195
MUSC 177 Class Guitar I 1
Introduction to the fundamentals of guitar technique and note reading for non-music majors. Topics include guitar history, repertoire, scales and exercises with an emphasis on classical as well as folk music. Music Education majors may also find this course particularly useful for classroom teaching.

MUSC 178 Class Guitar II 1
A continuation of Class Guitar I with a stronger emphasis on ensemble playing and development of a repertoire.
PREREQ: MUSC177.

MUSC 179 Organ Class 1
Students learn the basic techniques needed to play the organ. Students apply these skills in a class setting, focusing on introductory organ literature and hymn playing.
RESTRICTIONS: Requires permission of instructor.

MUSC 181 Applied Jazz Styles/Techniques I 2
Private studio instruction covering techniques and interpretation used in jazz performance. Examines a cross-section of styles and repertoire.
RESTRICTIONS: Requires audition.

MUSC 185 Ear Training and Sight Singing I 2
Techniques of sight singing and music reading skills. Development of facility in the aural recognition of melody, harmony and rhythm.
COREQ: MUSC195.

MUSC 186 Ear Training and Sight Singing II 2
Techniques of sight singing and music reading skills. Development of facility in the aural recognition of melody, harmony and rhythm.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC196.

MUSC 193 Sight Reading at the Keyboard I 1
Techniques for improving coordination and musical comprehension when playing from sight at the keyboard.
RESTRICTIONS: For keyboard majors.

MUSC 194 Sight Reading at the Keyboard II 1
Continuation of MUSC193.
PREREQ: MUSC193.

MUSC 195 Harmony I 3
COREQ: MUSC185.
RESTRICTIONS: Requires permission of instructor.

MUSC 196 Harmony II 3
Continuation of harmony: diatonic throughchromatic harmony with keyboard application. Chord structures and functional relationships. Basic melodic and contrapuntal compositional techniques. Writing, playing and analysis.
PREREQ: MUSC185 and MUSC195.
COREQ: MUSC196.

MUSC 197 Jazz Harmony 3
Study of elementary aspects of melody, harmony, texture, dynamics, rhythm and form in selected jazz and American popular literature; development of elementary aural-perceptual and compositional skills related to jazz and American popular music.
PREREQ: MUSC105.

MUSC 205 Music of the Non-Western World 3
Survey of non-Western world musical cultures utilizing textbook, reprinted reserve articles, films and in-class performances/demonstrations. Goal is the understanding and appreciation of various world musics.
PREREQ: MUSC105.

MUSC 206 Music of China, Korea and Japan 3
Systematically examines the origin and historical development of the musical cultures of the Far East. Studies how the musical and cultural influence of Chinese musical culture has had an enormous impact on the development of such cultures in Korea and Japan.

MUSC 207 History of Jazz 3
Chronological study of the style changes in jazz from the late 19th century to the present. Emphasis on the sociological, economic and technological influences of the period and on the principal personalities who have been primarily responsible for change.
PREREQ: MUSC105.

MUSC 209 History of Spanish Music 3
Covers the most outstanding traditions of Spanish music, including Arab-influenced Andalusian music, 13th-century music, schools of the “Renacimiento”, 17th-century court music, the “Zarzuela”, 19th-century Nationalism, and the most modern tendencies of the 20th-century.
RESTRICTIONS: Taught abroad only.

MUSC 210 Music of Britain 3
Chronological study of music of Britain with emphasis on English music from 1485 to present. Explores music for various media (including choral, instrumental, opera) and principal British composers, relating the development of musical styles to events in British history. When taught as part of UD London Semester, will include attendance at variety of London performances.
RESTRICTIONS: Requires permission of instructor.

MUSC 211 Introduction to Music History 3
Survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening.
PREREQ: MUSC195.

MUSC 212 History of Liturgy and Hymns 3
Study of the evolution, structure and content of historic liturgies and of the hymnody which developed within them. Includes an examination of Jewish and Eastern elements while focusing on the texts and music of the services and hymns of various traditions within the Western Church.

MUSC 214 Stringed Instruments Class: Violin, Viola, Cello, Bass 1
Development of performing and teaching skills.

MUSC 215 High Brass Instruments Class 1
Development of performing and teaching skills.
RESTRICTIONS: MUSC215 and MUSC216 to be taken consecutively in one academic year.

MUSC 216 Low Brass Instruments Class 1
Development of performing and teaching skills.
RESTRICTIONS: MUSC215 and MUSC216 to be taken consecutively in one academic year.

MUSC 217 Woodwind Instruments Class I 1
Development of performing and teaching skills.
RESTRICTIONS: MUSC217 and MUSC218 to be taken consecutively in one academic year.

MUSC 218 Woodwind Instruments Class II 1
Development of performing and teaching skills.
RESTRICTIONS: MUSC217 and MUSC218 to be taken consecutively in one academic year.

MUSC 219 Percussion Instruments 1
Development of performing and teaching skills.

MUSC 241 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: Sight-Reading Placement Test.
RESTRICTIONS: First course of a six-semester sequence.

MUSC 242 Accompanying Chamber Music: Piano 1
Accompanying vocalists and instrumentalists in the performance of chamber music with keyboard.
PREREQ: MUSC241.

MUSC 261 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-credit-hour studio class.
PREREQ: MUSC162.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 262 Private Study 1-8
The student adds to the course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes a one-credit-hour studio class.
PREREQ: MUSC261.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 271 Diction: German 1
A study of pronunciation rules for singing in German. Includes prakticum.
COREQ: Enrollment in applied study.

MUSC 272 Diction: French 1
A study of pronunciation rules for singing in French. Includes prakticum.
COREQ: Enrollment in applied study.

MUSC 273 Class Piano Intermediate I 1
Piano techniques applicable to the levels and needs of the students; a continuation of reading and transposition; and improvisation and repertory of grade two pieces.
PREREQ: MUSC176 and MUSC196.
RESTRICTIONS: For vocal or instrumental music majors with some background in piano playing.
MUSC 276 Class Piano: Intermediate II  1
A continuation of MUSC275
PREREQ: MUSC275

MUSC 279 Introduction to the Organ  2
Designed to provide information about the organ: its history, use and literature as well as tonal and mechanical aspects of its design

MUSC 281 Applied Jazz Styles/Techniques II  2
Private studio instruction covering techniques and interpretation used in jazz performance.
Examines a cross-section of styles and repertories
PREREQ: MUSC181
RESTRICTIONS: Requires audition

MUSC 285 Advanced Ear Training and Sight Singing I  2
Continuation of MUSC185 and MUSC186
PREREQ: MUSC186 and MUSC196
COREQ: MUSC295

MUSC 286 Advanced Ear Training and Sight Singing II  2
Continuation of MUSC185, MUSC186 and MUSC285
PREREQ: MUSC285 and MUSC295
COREQ: MUSC296

MUSC 287 Music Technology I  3
Overview and experience with commercially-available music-related hardware and software. Hardware includes IBM and Macintosh microcomputers, electronic keyboards and tone generators incorporating Musical Instrument Digital Interface (MIDI), digital recording systems, CD-ROM and videodisc. Software includes sequencers, notation packages, interactive composers, educational programs and hypermedia applications.
PREREQ: MUSC105 or MUSC195

MUSC 291 Practicum in Church Music  1
Introduces a variety of styles and information needed in the practice of church music. Students will learn to apply these skills through in-class experience with various instruments and resources.

MUSC 292 Organ Improvisation and Service Playing  2
Student learns and applies skills used in improvising at the organ and playing for church services. A basic conducting component is included.

MUSC 293 Jazz Improvisation I  3
A comprehensive study of jazz improvisation and techniques which will result in the student being able to improvise in a stylistically acceptable manner over a given set of chord progressions.
PREREQ: MUSC197

MUSC 294 Jazz Improvisation II  3
An advanced study of jazz improvisation vocabulary and techniques which will result in the student being able to improvise in a stylistically acceptable manner.
PREREQ: MUSC293

MUSC 295 Advanced Harmony I  3
PREREQ: MUSC186 and MUSC196
COREQ: MUSC286

MUSC 296 Advanced Harmony II  3
PREREQ: MUSC285 and MUSC295
COREQ: MUSC286

MUSC 301 Junior Recital  0 PF
A 30-minute public recital
RESTRICTIONS: Requires Junior status and permission of instructor

MUSC 302 Women in Music: An Alternate Survey  3
Survey of women's contributions to Western art music traditions from the 12th century to the present day through the study of women as composers, performers, patrons, and as the subject of musical expression. Explores cultural systems that have alternately encouraged and suppressed women's creativity. May be cross-listed with WOMS302
PREREQ: MUSC101 or MUSC211.

MUSC 303 Chamber Music Literature  3
Chamber music written for various combinations from the Baroque period to the present.
PREREQ: MUSC211, or MUSC101 and MUSC102

MUSC 305 The Symphony  3
The development of the symphony from the early 18th century to the present.
PREREQ: MUSC211 or MUSC101.

MUSC 309 Patterns of Patronage  3
Examines the creation, performance and transmission of music within broader contexts of the economic, political, social and technological environment. Emphasizes interdependence of musical activity and its patrons, including traditional forms of state, church, civic, mercantile, private, and public; also contemporary interaction with public, private, and third sectors.
RESTRICTIONS: Not open to Freshmen. Requires permission of instructor

MUSC 311 Music History: 400 through 1600  3
The history of musical style and theory in the Middle Ages (5th through 14th centuries) and the Renaissance (15th and 16th centuries)
PREREQ: MUSC211 or MUSC101.

MUSC 312 Music History: 1600 through 1827  3
The history of musical style and theory during the Baroque period (1600-1750), and the Classic period through the death of Beethoven (1827)
PREREQ: MUSC211 or MUSC101.

MUSC 313 Music History: 1825 to the Present  3
The Romantic era, Impressionism and the 20th century: Musical thought and style from 1825 to the present.
PREREQ: MUSC211 or MUSC101.

MUSC 321 Ensembles: Instrumental, Piano, or Vocal  1
Performance of chamber literature for instrument, piano or voice.
RESTRICTIONS: May be repeated for credit

MUSC 327 German Lieder  2
Literature survey of the standard vocal repertoire of the German tradition. Includes examples of the works of such composers as Schubert, Brahms, Schumann, Wolf and Strauss.
RESTRICTIONS: Open to Juniors and Seniors.

MUSC 328 Choral Literature  2
Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1500.
PREREQ: MUSC211.

MUSC 331 Orchestration  2
Orchestral and band arranging; review of instrumental ranges and colors; scoring for small ensembles; special problems in scoring accompaniments. Final arrangement performed by a University ensemble.
PREREQ: MUSC295.

MUSC 335 Basic Conducting  2
The principles of conducting and score reading.
PREREQ: MUSC285 and MUSC295.

MUSC 339 Viennese Composers  3
Selected Viennese composers including Mozart, Beethoven, Schubert, and the Strausses. Emphasis of the course will be on Viennese music. A combination of Music History and Music Appreciation.
RESTRICTIONS: Taught in Semester in Vienna program only

MUSC 341 Accompanying Chamber Music: Piano  1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC242.

MUSC 342 Accompanying Chamber Music: Piano  1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC341.

MUSC 345 History of Theatrical American Musical Theatre  3
Musical-dramatic forms of the 19th, 19th and 20th centuries in the United States and their impact on the modern musical theatre. Complete works read and compared to a series of criteria that are found in successful modern shows. Comparison of older and current work. May be cross-listed with THEA345.

MUSC 361 Private Study  1-8
The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes one or more contact hours. Studio class.
PREREQ: MUSC262.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 362 Private Study  1-8
The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument. Includes one or more contact hours. Studio class.
PREREQ: MUSC361.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 366 Independent Study  1-3
MUSC 387 MUSIC TECHNOLOGY II 3
Explores intermediate to advanced applications of music technology including professional level implementation of MIDI hardware and software. Topics include multitap interfaces, synchronization, MIDI sequencing and notation techniques, multimedia, and music related Internet services. Additional topics may be examined depending on student experience.
PREREQ: MUSC 287

MUSC 388 PRINCIPLES OF MUSIC INDUSTRY PRACTICE 3
Offers an understanding of the fundamental workings of the music industry. Examines theory/practice of core principles, focusing on provisions of copyright law, standard agreements, and the influence of professional organizations. Emphasis on framework for interaction among writers, artists, performers, publishers, record companies, producers.

MUSC 389 ELEMENTS OF MUSIC MANAGEMENT 3
Introduces principles involved in planning and management for performing arts organizations. Includes basic concepts of project development and implementation, production issues for public performances, communication skills and marketing techniques, utilization of new technologies, and aspects of resources planning and advocacy.
RESTRICTIONS: Requires permission of instructor.

MUSC 390 HONORS COLLOQUIUM 3
See ARSC 390 for course description.

MUSC 392 CONTRAPUNTAL WRITING 2
Contrapuntal techniques with emphasis on 16th- and 18th-century styles and forms.
PREREQ: MUSC 295

MUSC 393 KEYBOARD HARMONY 2
A practical course for the development of facility in applying knowledge of harmony to the keyboard. Emphasis on melody harmonization and improvisation.
PREREQ: MUSC 296
RESTRICTIONS: Requires two years of class or private piano.

MUSC 394 KEYBOARD HARMONY II 2
An advanced practical course for the development of facility in applying knowledge of harmony to the keyboard.
PREREQ: MUSC 393.

MUSC 395 FORM ANALYSIS 3
Structure of homophonic and polyphonic music representing different periods of musical history.
PREREQ: MUSC 296

MUSC 397 CONTEMPORARY HARMONY 3
Styles, harmonic principles and techniques in 20th-century music.
PREREQ: MUSC 296.

MUSC 401 SENIOR RECITAL 0 PF
A 60-minute public recital.
RESTRICTIONS: Requires Senior status.

MUSC 407 CONTEMPORARY MUSIC LITERATURE 3
Analysis of styles and techniques of contemporary composers beginning with compositions of the late 1950s.
PREREQ: MUSC 313 or permission of instructor.

MUSC 420 ADVANCED COMPOSITION 3
Creative writing in the vocal and instrumental media with individual and group criticism.
PREREQ: MUSC 297
RESTRICTIONS: May be repeated up to nine credit hours.

MUSC 421 SPECIAL PROJECTS IN MUSIC THEORY 3
Theory majors do research and study under guidance of a faculty advisor on an approved topic for a formal paper to be presented at a public lecture.
PREREQ: MUSC 485

MUSC 427 FRENCH ART SONG 2
A literature survey of the standard vocal repertoire of the French tradition. Includes examples of the works of such composers as Fauré, Debussy, Duparc and Poulenc.
RESTRICTIONS: Requires Junior or Senior status.

MUSC 428 TWENTIETH-CENTURY ART SONG 2
A literature survey of the standard vocal repertoire of the 20th Century. Includes examples of the works of such composers as Barber, Britten, Schonberg, Ives, Vaughan Williams and Rorem.
RESTRICTIONS: Requires Junior or Senior status.

MUSC 441 ACCOMPANYING CHAMBER MUSIC: PIANO 1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC 342.

MUSC 442 ACCOMPANYING CHAMBER MUSIC: PIANO 1
Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.
PREREQ: MUSC 341.

MUSC 443 CHAMBER MUSIC PERFORMANCE 1
Survey of chamber music literature through performance. Emphasis is placed on the development of ensemble skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players.
RESTRICTIONS: Requires permission of instructor.

MUSC 461 PRIVATE STUDY 1-8
The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC 296.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 462 PRIVATE STUDY 1-8
The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument. Includes a one-contact-hour studio class.
PREREQ: MUSC 461.
RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 464 INTERNSHIP 1-3
Students are placed with performing arts organizations or music businesses both within and outside the state. Requires participation in Careers Colloquium, an informal series of lectures/roundtable discussions with guests currently employed in the music industry or with performing arts organizations.
RESTRICTIONS: Open to Music Management Studies minors only.

MUSC 466 INDEPENDENT STUDY 1-3

MUSC 480 VOCAL PEDAGOGY 3
Designed for those who plan to work with the singing voice. Includes vocal research, comparative pedagogy, observation of teaching and practical teaching experience.

MUSC 485 PEDAGOGY OF THEORY 3
Materials, organization, techniques and problems of teaching high school and basic college theory courses. Attention to sight singing, ear training, keyboard and form and analysis materials. Observation and teaching of theory courses at the Freshman and Sophomore levels.
PREREQ: MUSC 286 and MUSC 296.

MUSC 489 OPERA WORKSHOP 1-3
Dramatic and musical preparation of operatic roles through the production of a complete opera/operetta.
RESTRICTIONS: Admission by audition, with permission of private instructor, and preference given to vocal performance majors.

MUSC 561 ADVANCED PRIVATE STUDY 1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument, e.g., Private Study (Piano).
PREREQ: MUSC 462.

MUSC 601 MASTER'S RECITAL 2 PF
A sixty-minute public recital.
PREREQ: MUSC 662.
COREQ: MUSC 662.

MUSC 603 CHAMBER MUSIC LITERATURE 3
Survey of chamber music literature from the 17th century to the present.
RESTRICTIONS: Requires permission of instructor.

MUSC 605 SYMPHONIC LITERATURE 3
Historical and structural analysis of major symphonic works from the 18th century to the present.
RESTRICTIONS: Requires permission of instructor.

MUSC 606 WIND LITERATURE 3
History of the wind band and its music from the Renaissance to the present, with emphasis on the wind music from the 19th and 20th centuries for wind ensemble and concert bands. Examines wind literature suitable for secondary school and college-level performing groups.
RESTRICTIONS: Requires permission of instructor.

MUSC 611 STUDIES IN MUSIC HISTORY 3
A survey of representative compositions from various periods of music history. Includes a study of the relationship of music to the sociocultural background of each epoch and discussions of performance practice problems. Topics of study may change with each time of offering.
RESTRICTIONS: Requires satisfactory score on music history graduate placement exam.
NUTRITION AND DIETETICS

MUSC 620 LARGE ENSEMBLE 1
Participation as a performer in a large ensemble.
RESTRICTIONS: Entry audition required

MUSC 621 CHAMBER ENSEMBLE 1
Participation as a performer in a chamber ensemble
RESTRICTIONS: Entry audition required

MUSC 622 MATERIALS AND METHODS OF RESEARCH 3
Examines the major materials used in research in the areas of music history, theory, performance, and education, as well as the methods of conducting research in these fields
RESTRICTIONS: Requires permission of instructor

MUSC 637 ADVANCED INSTRUMENTAL CONDUCTING 3
Advanced conducting techniques for directors of instrumental performing groups
RESTRICTIONS: Requires permission of instructor

MUSC 638 LARGE ENSEMBLE PRACTICUM 1
Participation in a large ensemble and seminar with ensemble director
RESTRICTIONS: Requires permission of instructor

MUSC 640 HISTORY AND PHILOSOPHY OF MUSIC EDUCATION 3
Topics include philosophical issues concerning the role of arts in education, intrinsic and extrinsic rationales for music in the schools, and arts advocacy at the local, state, and national levels. Also includes the history and philosophy of music education in the United States from the colonial period to the present.
RESTRICTIONS: Requires permission of instructor

MUSC 643 ADVANCED CHAMBER MUSIC PERFORMANCE 1
In-depth survey of chamber music literature through performance. Emphasis is placed on the development of advanced ensemble skills while exploring music from the Baroque Period through the present day. Open to both majors and non-majors and open to voice, string, piano, and wind players

MUSC 661 ADVANCED PRIVATE STUDY 1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice, or an orchestral instrument, e.g., Private Study (Piano).
RESTRICTIONS: Requires audition

MUSC 662 ADVANCED PRIVATE STUDY 1-4
Advanced instruction in voice or instrument. The student adds to course title the branch of study elected: piano, organ, voice or an orchestral instrument, e.g., Private Study (Piano)
PREREQ: MUSC 661

MUSC 675 GENERAL MUSIC K-12 3
Learning strategies to develop listening, performing, creating, and literacy skills in a general music curriculum. Recommended for directors of performing ensembles
RESTRICTIONS: Requires permission of instructor

MUSC 676 SEMINAR IN MUSIC EDUCATION 3
Advanced topics in music education
RESTRICTIONS: Requires permission of instructor

MUSC 679 PROFESSIONAL IMPROVEMENT PROJECT 1 3
Development of a portfolio to include unit plans based on synthesis of content from prior courses
RESTRICTIONS: Requires permission of instructor. Taken in sequence with MUSC 680 as an alternative to thesis option.

MUSC 680 PROFESSIONAL IMPROVEMENT PROJECT II 3
Implementation of the portfolio developed in MUSC 679
PREREQ: MUSC 679
RESTRICTIONS: Taken in sequence with MUSC 679 as an alternative to thesis option.

MUSC 681 PEDAGOGY AND LITERATURE 3
The study of teaching methods and literature (music scores, books and other media) Shows teaching skills needed at the university level and lower

MUSC 695 ADVANCED ANALYTICAL TECHNIQUES 3
Examination of structural, melodic, rhythmic, harmonic and textural aspects of selected music literature and their significance in artistic performance
RESTRICTIONS: Requires satisfactory score on music theory graduate placement exam

MUSC 869 MASTER'S THESIS 1-6

NTDT 103 INTRODUCTION TO NUTRITION PROFESSIONS 1 PF
Career opportunities in dietetics and nutrition. Provides information about undergraduate programs and the competencies required of dietitians and nutritionists. Introduces opportunities for undergraduate research. Introduction to concepts of a profession and relevant professional organizations
RESTRICTIONS: Open to Freshman or Sophomores

NTDT 200 NUTRITION CONCEPTS 3
Functions and sources of nutrients, dietary adequacy, energy balance and metabolism with emphasis on health promotion. Includes weight control, evaluation of popular diets, vegetarianism, eating disorders, alcohol, other current issues and concerns in nutrition
RESTRICTIONS: Credit for graduation limited to one of the following: NTDT 200 or NTDT 303

NTDT 201 FOOD PRINCIPLES 2
Principles of food selection and preparation as related to chemical and physical properties of food. Includes the composition and structure of foods, functional properties of ingredients, and methods to optimize desirable quality characteristics
COREQ: NTDT 211
RESTRICTIONS: Open to APN, DIET, and NS majors only

NTDT 211 FOOD PRINCIPLES LABORATORY 1
Principles of food selection and preparation as related to the chemical and physical properties of food in selected laboratory experiments. Examine the composition and structure of foods, functional properties of ingredients and methods to optimize desirable quality characteristics
COREQ: NTDT 211
RESTRICTIONS: Open to APN, DIET, and NS majors only

NTDT 222 NUTRITION CONTROVERSIES 1
Examines topical issues in nutrition via discussion format
COREQ: NTDT 200

NTDT 240 INTRODUCTION TO CLINICAL DIETETICS 3
Orientation to clinical dietetics; basic skills required for nutritional care; nutritional assessment, dietary counseling, clinical simulations, nutritional care plans and composition of basic therapeutic diets
PREREQ: NTDT 200

NTDT 255 MULTICULTURAL FOOD HABITS 3
Food habits of diverse cultural groups. Determinants of traditional and current food habits, historical and cultural context. Emphasis on ethnicity population groups in the United States and contribution of selected dietary patterns to knowledge of health and disease prevention. Impact of migration to different cultural settings

NTDT 256 MULTICULTURAL FOOD LABORATORY 1
Sampling of foods of diverse cultural groups utilizing demonstrations by restaurateurs and individuals as well as class preparation. Field trips to markets and ethnic food stores
COREQ: NTDT 255

NTDT 305 NUTRITION IN THE LIFESPAN 3
Nutrition and health during the different stages of life: pregnancy, lactation, infancy, preschool years, middle childhood, adolescence, adulthood and later maturity
PREREQ: NTDT 200 and a course in biology

NTDT 310 NUTRITION AND ACTIVITY 3
Energy and nutrient needs for activity with emphasis on particular physical and athletic activities; common myths and fallacies concerning diet and athletic performance; and appropriate dietary approaches for specific activities and active people
PREREQ: NTDT 200 and a physiology course

NTDT 321 QUANTITY FOOD PRODUCTION AND SERVICE 3
Principles of quantity food production and delivery systems; menu planning and purchasing design; sanitation and technical operations in a food service system
PREREQ: NTDT 200 and NTDT 210

NTDT 322 MANAGEMENT OF FOOD AND NUTRITION SERVICES 3
Organization and administration of not-for-profit and entrepreneurial services. Functions and responsibilities related to these products including planning, marketing, total quality and human resource management, and food and labor cost accounting

NTDT 325 LABORATORY IN QUANTITY FOOD PRODUCTION AND SERVICE 1
Laboratory experience in quantity food production and delivery systems with emphasis on equipment, principles of safe food handling, quality standards and controls and menu planning
COREQ: NTDT 321

NTDT 328 FOOD SERVICE FACILITY DESIGN 1
Development of quantity food production kitchen design. Considerations include material flow, equipment requirements, functional areas, safety and sanitation, and energy and water resources
PREREQ: NTDT 321, NTDT 325

NTDT 330 NUTRITION COUNSELING 3
Theories, skills and techniques of nutrition interviewing and counseling
PREREQ: NTDT 200

NTDT 350 NUTRITION AND OLDER ADULTS 3
Discussion of the physiology of aging on fundamental nutrition processes, food and nutrient requirements and intakes, assessment of nutritional status, and nutrition related problems of older adults
PREREQ: NTDT 200 and BISC 106 or BISC 276
Micro- and macronutrients – 3
Mechanisms and interactions of vitamins and minerals in cellular metabolism, scientific bases of nutrient requirements during the life cycle
PREREQ: NTD400

Micro- and macronutrients – 3
Provides direction for career decisions including self-assessment, resume development, and interview preparation. Focuses on the post-baccalaureate career pathways of employment, graduate study, and the supervised practice experience. Explores registration, specialty certification and licensure for dietitians.
RESTRICTIONS: Open only to Senior dietetics majors

Maternal and Infant Nutrition – 3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; and neonatal nutritional needs and current infant feeding practices
PREREQ: NTD400 and BISC276

Nutritional Assessment Methods – 2
Nutritional assessment methods and techniques including evaluation of dietary intake, anthropometric measurements, biochemical tests, and clinical assessment. Overview of the methodologies involved in nutrition research.
PREREQ: NTD400 and a course in statistics.

Nutrition Clinic Practicum – 1-6
Experience in ongoing activities of the University of Delaware Nutrition Clinic including client counseling, group presentations, nutrition education materials development and research activities
PREREQ: NTD330
RESTRICTIONS: Requires permission of instructor

Nutrition and Disease – 3
Examination of the metabolic and physiological aberrations in selected conditions and implications for medical nutrition therapy.
PREREQ: NTD400 and BISC106 or BISC276

Nutrition Education – 3
Identification of objectives for nutrition education; selection and use of methods, materials and resources for different age levels; integration of nutrition into the total health and consumer aspects of school, non-school and adult programs.
PREREQ: NTD200.

Topics in Nutrition and Dietetics – 1-3
In-depth analysis of a specific topic in an area of nutrition and dietetics.
RESTRICTIONS: Junior level NTD course(s) relating to the specific topic required

Community Nutrition – 3
Nutritional care as a part of health maintenance and health care delivery; the relationship of community resources, structure and dynamics to an individual’s ability to be well fed. Nutritional needs and programs. Means of affecting change in nutrition knowledge and practice.
PREREQ: NTD400 and NTD321.

Community Nutrition Field Experience – 2
Direct client contact through delivery of nutritional services in community health maintenance and health care delivery facilities. Firsthand experience with the nutritional management of clients in a community nutrition program
PREREQ: NTD322 and NTD440.
COREQ: NTD460

Independent Study – 1-6
Travel study of transcultural food habits: attitudes, beliefs, customs and taboos. Visits to major food industries and health organizations, and interaction with indigenous population
PREREQ: NTD200.

PDIETICS Practicum I – 4 PF
Introduces supervised practice experiences for incorporation and application of skills, knowledge, and attitudes with special emphasis on current dietary issues facing the health professional in public health nutrition
COREQ: NTD650.
RESTRICTIONS: Open to Dietetic Internship students only

PDIETICS Practicum II – 4 PF
Continued supervised practice experiences for incorporation and application of skills, knowledge, and attitudes, focusing on entry-level competence with special emphasis on current dietary issues facing the health professional
PREREQ: NTD650.
COREQ: NTD651
RESTRICTIONS: Open to Dietetic Internship students only

Fundamentals of Nutrition and Metabolism – 3
Review of metabolic processes related to nutrition and current research related to macronutrient and micronutrient functions
RESTRICTIONS: Undergraduate preparation in biochemistry, physiology and basic nutrition

Advanced Nutrition – 3
Metabolism and its relation to human nutrition; current literature; methods and techniques of research
PREREQ: NTD400 or NTD610

Advanced Nutrition and Physical Activity – 3
Critical analysis of current research on effects of nutrition, food and diet on physical activity and optimal athletic performance. Develops specific topics and interests through independent projects
PREREQ: Undergraduate nutrition and physiology courses

Maternal and Infant Nutrition – 3
Maternal physiological adjustments in pregnancy and their relationship to nutritional needs; effect of maternal nutrition on fetal growth and development; physiology of lactation and maternal nutrient needs; neonatal nutritional needs and current infant feeding practices
PREREQ: NTD400 and BISC106 or BISC406

Nutrition Research Methods – 2
Discussion and experience with selected methods and techniques in nutrition research
PREREQ: Upper-division course work in nutrition, biochemistry and physiology

Monogastric Nutrition – 3
See ANSC624 for course description

Trace Minerals and Vitamins – 3
Recent advances in knowledge of the nutritional significance of trace minerals and vitamins; their physiological function(s); factors affecting needs and utilization; assessment of requirements; occurrence in food supply; and current issues and concerns. Primary focus on human nutrition with comparative aspects in other living systems utilized to illustrate significant similarities and/or differences. May be cross-listed with ANSC630
PREREQ: Junior-level course work in human or animal nutrition, biochemistry or biological sciences

Nutrition and Aging – 3
Addresses topics related to the effects of aging on fundamental nutrition processes, food and nutrient requirements, nutrition screening and assessment of nutritional status, nutrition intervention and food assistance programs and nutrition related disorders of elderly adults
PREREQ: NTD310 or NTD400 or NTD401

Nutrition Education – 3
Identification of objectives for nutrition education; selection and use of methods, materials and resources for different age levels; and integration of nutrition into the total health and consumer aspects of school, non-school and adult programs.
PREREQ: NTD200.

Current Perspectives in Dietetics I – 2
Introduces exploration of roles and responsibilities of today’s dietitian in foodservice management, clinical, and community dietetics. Emphasis on concepts relevant to evolving therapies and technologies in the profession and issues that influence ethical, legal, and professional responsibilities of dietitians

Current Perspectives in Dietetics II – 2
Continued exploration of roles and responsibilities of today’s dietitian in clinical, community, and foodservice management dietetics. Emphasis on concepts relevant to evolving therapies and technologies in the profession and issues that influence ethical, legal, and professional responsibilities of dietitians

Topics in Nutrition and Dietetics – 1-3
Analysis of a specific topic in an area of nutrition and dietetics
RESTRICTIONS: Requires permission of instructor

Ruminant Nutrition and Metabolism – 3
Nutritional care as a part of health maintenance and health care delivery; the relationship of community resources, structure and dynamics to an individual’s ability to be well fed. Nutritional needs and programs. Nutrition program planning and evaluation; community assessment techniques.
RESTRICTIONS: Advanced Nutrition course required.
NURSING

NURS 205 SOCIETAL CONTEXT OF NURSING 3
Introduces conceptual frameworks for nursing practice within a pluralistic society. Utilizes historical perspective to examine the current status of nursing within the health care system. Discusses importance of professionalism, including ethical and legal responsibilities.
PREREQ: BISC207, BISC208, CHEM105, CHEM106, ENGL110, STAT201, and SOC1200-level or above
COREQ: NURS215
RESTRICTIONS: Open to nursing majors only.

NURS 212 PATHOPHYSIOLOGICAL CONCEPTS 3
Application of sciences to maintenance of, and alterations in, homeostasis. Pathophysiological concepts relate to stress, inflammation, immunity, neoplasia, pain and alterations in fluid/electrolytes balance, blood flow and respiration. Exploration of disorders common throughout an individual's life span.
PREREQ: BISC207, BISC208, BISC276, CHEM105, CHEM106, ENGL110, STAT201, and SOC1200-level or above
COREQ: BISC371
RESTRICTIONS: Open to Nursing majors only.

NURS 215 BASIC NURSING PRACTICE SKILLS 1
Introduces basic client care skills. Emphasis on the intellectual, interpersonal and psychomotor skills foundational to nursing practice.
PREREQ: BISC207, BISC208, CHEM105, CHEM106, ENGL110, STAT201, and SOC1200-level or above
COREQ: NURS205
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 306 DETERMINANTS OF WELLNESS 5
Selected concepts/theories pertinent to promotion of optimal health of well clients of all ages from diverse sociocultural backgrounds within the context of family, community and health care system.
PREREQ: BISC276, BISC371, IFST201, NTD2700, NURS205, NURS215, NURS212, PSYC201 and STAT201
COREQ: NURS312, NURS314 and NURS315
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 308 RESTORATIVE NURSING PRACTICE 1-4
Concepts/theories pertinent to promotion of optimal health of clients experiencing common and/or recurring health problems.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS317; NURS318 or NURS319; and NURS332
RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 312 PATHOPHYSIOLOGY 3-4
Focuses on biological processes leading to alterations of body structure and function. Emphasis on identification of etiology and pathogenesis of selected diseases.
PREREQ: BISC276, BISC371, IFST201, NTD2700, NURS205, NURS215, NURS212, PSYC201 and STAT201
COREQ: NURS306, NURS314 and NURS315
RESTRICTIONS: Open to nursing majors only. Nursing major must take 3 credits. BRN majors must take 4 credits.

NURS 314 PSYCHOPATHOLOGY 2-3
Analyzes psychophysiological processes across the life span. Emphasis on the etiology, manifestations and treatment options of selected psychophysiological processes. Addresses current trends and issues in the mental health field.
PREREQ: BISC276, BISC371, IFST201, NTD2700, NURS205, NURS215, NURS212, PSYC201 and STAT201
COREQ: NURS306, NURS312 and NURS315
RESTRICTIONS: BRN major - Admission to BRN Program. Open to nursing majors only. Nursing major must take 2 credit hours. BRN major must take 3 credit hours.

NURS 319 PRACTICUM I 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care for well clients of all ages, from diverse sociocultural backgrounds, within the context of family, community and health care systems. Comprises 112 clinical hours.
PREREQ: BISC276, BISC371, IFST201, NTD2700, NURS205, NURS215, NURS212, PSYC201 and STAT201
COREQ: NURS312, NURS314 and NURS306
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 317 PRACTICUM II 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adult clients with common and/or recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS308, NURS317 and NURS332
RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 318 PRACTICUM III 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS308, NURS317 and NURS332
RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 332 PHARMACOLOGICAL NURSING RESPONSIBILITY 3
Uses the conceptual framework of human needs to focus on the therapeutic and adverse biological, psychological and social reactions to pharmacological agents; drug use and medication abuse; client teaching; pertinent laboratory tests; current research findings. Nursing responsibilities emphasized with the nursing process.
PREREQ: NURS306, NURS312, NURS314 and NURS315
COREQ: NURS308, NURS317 and NURS332
RESTRICTIONS: Open to nursing majors only.

NURS 340 CURRENT PERSPECTIVES IN NURSING 2
Introduces nursing theory and conceptual foundations for practice within a pluralistic society. Provides overview of principles of nursing education and practice at the baccalaureate level. Focuses on healthcare needs within diverse practice settings, emphasizing emerging legal and ethical responsibilities, economic and sociocultural influences.
RESTRICTIONS: Admission to BRN Program.

NURS 342 NURSING INFORMATICS 2
Addresses the current utilization of evolving technologies in nursing/client education, practice, administration and research. RESTRICTIONS: Admission to BRN Program.

NURS 343 TRANSITION TO BACCALAUREATE NURSING 1-2
Addresses issues related to the socialization and transition to baccalaureate nursing education and practice. Complements content of NURS340 and NURS342. Incorporates the practical application of evolving technologies with emphasis on nursing/client education. Introduces University and BRN Program resources.
PREREQ: NURS340 and NURS342

NURS 344 WELLNESS AND HEALTH ASSESSMENT 2
Explores selected concepts, theories and skills utilized in health promotion and disease prevention of individuals from socioculturally diverse populations within the context of family, community and healthcare system. Includes key elements of a biopsychosocial health history and health assessment of individuals across the life course.
PREREQ: NURS343

NURS 366 INDEPENDENT STUDY 1-6

NURS 405 INTRODUCTION TO NURSING RESEARCH 2-3
Introduction to nursing research methods basic to identification of researchable nursing problems and to evaluation of existing nursing research for consumerism.
PREREQ: Nursing major - NURS308, NURS317, NURS318 or NURS319, and NURS332. BRN major - NURS441
COREQ: Nursing major - NURS408, NURS417, NURS419 or NURS419
RESTRICTIONS: Nursing major must take 3 credit hours. BRN major must take 2 credit hours. Open to nursing majors only.
NURS 408 Restorative Nursing Practice II 4
Concepts and theories pertinent to promotion of optimal health of clients with selected and less common health problems.
PREREQ: NURS308, NURS317, NURS318 or NURS319 and NURS332
COREQ: NURS417, NURS418 or NURS419, and NURS405
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 409 Professionalism in Nursing Practice 2
Concepts, theories and issues that influence nurses' legal, ethical and professional responsibilities to nursing and to the public.
PREREQ: NURS405, NURS408, NURS417, NURS418 or NURS419
COREQ: NURS420
RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 411 Topics in Health Care Delivery 1-6
A consideration of selected issues and problems of nursing practice within the health care delivery system. Exploration of some topics may include a laboratory or clinical component.
Variable topics
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332. No prerequisites for BRN major.
COREQ: NURS405, NURS417, NURS418 or NURS419
RESTRICTIONS: Open to nursing majors only. May be repeated for up to six credit hours.

NURS 412 Issues in Adult Health and Development 3
This multidisciplinary course provides broad exposure to the aging process through classroom experiences and one-on-one interaction with older adults participating in an affiliated health promotion program. Course content emphasizes age-related physiological, psychological and social changes and variability in the aging process.

NURS 417 Practicum V 3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health for adult clients with less common health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332
COREQ: NURS408, NURS417 and NURS418 or NURS419
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 418 Practicum VI 3
Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of children with common and/or recurring health problems. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS308; NURS317; NURS318 or NURS319; and NURS332
COREQ: NURS408, NURS417 and NURS418 or NURS419
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 419 Practicum VII 3
Experiences for incorporation and application of selected concepts and theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes implementation and evaluation steps of nursing process. Comprises 84 clinical hours.
PREREQ: NURS308, NURS317, NURS318 or NURS319, and NURS332
COREQ: NURS408, NURS417 and NURS418 or NURS419
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 420 Practicum VIII 3
Selected experiences for the exploration and application of the basic concepts and theories of nursing leadership and management that facilitate transition to the professional role of the nurse. Comprises 168 clinical hours.
PREREQ: NURS405, NURS408, NURS417, and NURS418 or NURS419
COREQ: NURS409
RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 441 Learning Laboratory: Health Assessment 1
Demonstrates and integrates physical and psychological assessment skills on selected clients in the laboratory setting. Incorporates the practical application of evolving technologies in nursing practice and administration includes orientation to BRN Role Practicum.
PREREQ: NURS344

NURS 442 Community Health Nursing 3
Focuses on conceptual foundations for community health nursing practice with the community, family and individual as clients. Diversity in nursing roles and practice is related to community health promotion and community health problems.
PREREQ: NURS340 and NURS342
COREQ: NURS344

NURS 443 BRN Role Practicum 3
A preceptored clinical experience focused upon the integration of concepts learned in baccalaureate nursing education.
PREREQ: NURS441, NURS442 and NURS446
RESTRICTIONS: NURS446 is either a prerequisite or corequisite.

NURS 445 Nursing Research Applications 1
Demonstrates the practical application of technology in selected steps of the research process. Explores the process of research utilization as a mechanism to develop a research based nursing practice.
PREREQ: NURS405, NURS441 and NURS442

NURS 446 Leadership and Organizational Behavior 2
Introduces organizational theory and structure, nursing care delivery systems and components of leadership. Focuses on the role of the nurse leader in organizing, teaching, decision-making, evaluating, planning change and managing conflict.
PREREQ: NURS343

NURS 447 Independent Study 1-6
NURS 803 Theoretical Foundations of Nursing 3
Examines the theoretical base of nursing as a discipline. The development of selected models and theories are analyzed with emphasis on relevance to nursing practice, education, and research.
RESTRICTIONS: Open to Nursing majors only.

NURS 804 Advanced Nursing Practice: Roles and Issues 3
Focuses on roles and issues affecting nurses engaged in advanced practice. The roles of the clinical nurse specialist, nurse practitioner and nurse administrator are analyzed in relation to current issues and concepts of advanced practice.
RESTRICTIONS: Open to Nursing majors only.

NURS 806 Transcultural Health Care 3
Understanding and respect of the differences in cultural backgrounds between health care providers and consumers provide the framework for the study of the impact of culture on the relationship. Emphasis on examining the variety of meanings of health and illness among selected cultures and ethnic groups.
RESTRICTIONS: Requires RN and permission of instructor.

NURS 807 Ethics and Health Care 3
Provides an opportunity to analyze philosophic positions, ethics theories and moral principles encountered by health care professionals in their role as providers. Discusses issues common to clinical practice settings and ethical dimensions.
RESTRICTIONS: Requires permission of instructor.

NURS 809 Health Behavior 3
See HPR809 for course description.

NURS 810 Research Methods in Nursing 3
Focuses on the relationship between nursing theories and research, the scientific method, research design and methodology. Students develop a research proposal.
COREQ: NURS803 and first clinical course.
RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

NURS 814 Nursing Management in Contemporary Health Care Settings 3
Analysis of organizational behavior of individuals and groups in health care systems related to nursing management. Emphasis on the application of management theory and concepts to issues encountered in the work setting.
RESTRICTIONS: Requires BSN and permission of instructor.

NURS 815 Nursing Administration: Accounting, Finance and Organizational Budgets 3
Provides the basic principles and concepts of effective management of budgets for nursing units. Includes analysis of the environment, nursing organization and impact on nursing care.
RESTRICTIONS: Requires BSN and permission of instructor.

NURS 820 Advanced Health Assessment 3
Advances knowledge and proficiency in performing health assessments. Such assessment includes eliciting a complete health history and performing a comprehensive physical examination.
RESTRICTIONS: BSN and a Basic Physical Assessment Course.

NURS 821 Advanced Pathophysiology 3
Involves advanced study of the etiology and pathogenesis of the physiologic and biologic manifestations of disease in individuals throughout the life span. In addition to the common clinical disorders and diseases of children and adults, complex pathological sequela will be studied.
RESTRICTIONS: BSN.

NURS 822 Advanced Pharmacology 3
Principles of pharmacology are applied to the therapeutic management of the client. Emphasis is placed on prescribing, monitoring drug regimen, identifying adverse reactions, and anticipating changes inherent in self medication.
RESTRICTIONS: BSN.

NURS 823 Management of Women's Health Care 3
Focuses on gynecological and reproductive primary health care. Emphasis is on management of gynecologic health needs and the normal reproductive cycle.
PREREQ: NURS804, NURS820 and NURS821
COREQ: NURS822.
NURS 824 Management of Children’s Health 3
Focuses on delivery of primary health care to children and adolescents. Emphasis is placed on physical and developmental variations and management of acute and episodic illness.
PREREQ: NURS804, NURS820 and NURS821.
COREQ: NURS822.

NURS 825 Management of Adult Episodic Health Needs and Problems 3
Focuses on delivery of primary care to adults and the elderly with acute episodic health problems. Emphasis is placed on the clinical decision making that is necessary to plan and provide primary health care services.
PREREQ: NURS804, NURS820 and NURS821.
COREQ: NURS822.

NURS 826 Management of Adult Chronic Health Needs and Problems 3
Focuses on delivery of primary care to adults and the elderly with chronic health problems. Emphasis is placed on management of ongoing needs.
PREREQ: NURS804, NURS820, and NURS821.
COREQ: NURS822.

NURS 827 Preceptorship 1-6
Comprehensive course builds on all previous clinical courses. Emphasis is placed on clinical decision making in an interdisciplinary team environment with the nurse practitioner as the principal provider of primary care.
PREREQ: All required clinical courses.

NURS 828 Nurse Practitioner Seminar 1
Culminating experience in role development. Emphasis is placed on the role of the nurse practitioner in the current health care system. Issues such as marketing, practice acts, reimbursement, and prescriptive privileges will be discussed.
PREREQ: All required clinical courses except NURS827.

NURS 829 Advanced Management of Women’s Health Care 3
Focuses on the delivery of primary care to women with acute and chronic obstetric and gynecologic problems.
PREREQ: NURS823.

NURS 830 Advanced Management of Children and Adolescent Health Care 3
Focuses on the delivery of primary health care to specific populations. Emphasis is on the special problems of the neonate and high risk children and adolescents.
PREREQ: NURS824.

NURS 831 Comprehensive Assessment of Older Persons 3
This course provides a foundational basis for geriatric/gerontological clinical nurse specialists and nurse practitioners. Content is directed at assessing older adults and their families and beginning to assist them with a continuum of health promotion, disease prevention, and disease management care.
PREREQ: NURS803, NURS804, and NURS821.

NURS 832 Health and Disease Management for Older Persons 3-4
Builds on NURS831 by providing opportunities for students to gain knowledge and skills related to primary, secondary and tertiary prevention of diseases and disabilities in older persons.
PREREQ: NURS831.

NURS 836 Organizational Theories and Nursing Administration 3-4
Introduces graduate students to theories of administration, organization and management, their interaction with nursing theories and their influence on management of health care agencies. The interaction of theories with attainment of institutional goals is included.
COREQ: NURS804.

NURS 837 Organizational Goals and Planning Strategies 3-4
Analyzes organizational systems and the role of nurse managers. Students identify organizational needs, formulate goals and objectives appropriate to health care agencies, and identify strategies appropriate to accomplishing goal attainment with ethical constraints of health care.
PREREQ: NURS836.

NURS 838 Nursing Management and Evaluation 4
Emphasizes the role of nurse managers in personnel development, promoting research in clinical settings, and developing and implementing quality improvement initiatives and their implications for nursing on health care.
PREREQ: NURS837.

NURS 840 Cardiopulmonary Nursing I 3-4
Explores the scientific basis of prevention programs for cardiopulmonary problems as well as of therapy for newly diagnosed or acute problems. Emphasis on assessment and therapeutic intervention.
COREQ: NURS804 and NURS821.

NURS 841 Cardiopulmonary Nursing II 3-4
Theoretical and clinical investigations of cardiopulmonary nursing problems that require long term care or follow up of adult clients in a variety of community settings. Emphasis is on assessment, health maintenance and rehabilitation.
PREREQ: NURS840.

NURS 845 Oncology/Immune Deficiency Nursing I 3-4
Explores the scientific basis of prevention programs and of therapy for newly diagnosed or acute oncological/immune deficiency problems in adults. Emphasis on assessment and therapeutic intervention.
COREQ: NURS804 and NURS821.

NURS 846 Oncology/Immune Deficiency Nursing II 3-4
Theoretical and clinical investigations of oncological/immune deficiency nursing problems that require long-term care or follow-up of adult clients in a variety of community settings. Emphasis is on assessment, health maintenance, home hospice care and survivorship.
PREREQ: NURS845.

NURS 850 Nursing of Women and Newborns I 3-4
Biopsychosocial needs of women and newborns. Emphasis on interventions by the advanced practice nurse to maintain or restore steady state in low risk clients.
COREQ: NURS804.

NURS 851 Nursing of Women and Newborns II 3-4
Biopsychosocial needs of women and newborns. Emphasis on interventions by the advanced practice nurse to maintain or restore steady state in clients with highly complex health care needs.
PREREQ: NURS850.

NURS 854 Nursing of Children I 3-4
Explores the scientific basis for the routine health care guidance required by children and their families. The primary focus of the course is on the acutely ill child.
COREQ: NURS804.

NURS 855 Nursing of Children II 3-4
Explores the biopsychosocial needs of children with chronic conditions and their families. Emphasis is on the interventions of the advanced practice nurse to assist these children to attain, maintain or regain health.
PREREQ: NURS854.
COREQ: NURS820.

NURS 868 Research 1-3
Investigation of a research problem in clinical nursing, finance, administration, personnel management, public policy or education and completion of a scholarly research project.
RESTRICTIONS: Open to nursing majors only.

NURS 869 Master’s Thesis 1-6
Conducts a research project in clinical nursing, finance, administration, personnel management, public policy or education and completion of a scholarly research project.
RESTRICTIONS: Open to nursing majors only.

OPERATIONS RESEARCH
ORES 601 Survey Operations Research I 3
Covers various deterministic mathematical programming methods (LP, integer dynamic), network models and basic inventory models.
PREREQ: Linear algebra.

ORES 602 Survey Operations Research II 3
Covers various deterministic operations research models including decision theory, game theory, project planning, inventory models, simulation, markov decision processes and Queuing models.
PREREQ: Linear algebra and MATH 435.

ORES 603 Operations Research Practice 3
Instructor's role: The instructor's role is to provide consulting services to students in the application of operations research models and methodologies to real-world problems. The instructor's role is to provide guidance and feedback to students as they develop and implement operations research models and methodologies in real-world settings.
PREREQ: ORES 601.
COREQ: ORES 602.

ORES 650 Urban Transportation Systems 3
See CIEG 650 for course description.
ORES 664 OPERATIONS RESEARCH INTERNSHIP 1-6 PF
Supervised, on-the-job experience, performing technical work for clients including OR applications, econometrics and statistical applications
RESTRICTIONS: Requires permission of instructor.

ORES 690 OPERATIONS RESEARCH SEMINAR 0 PF
Seminars to be given by faculty and by visiting academicians, industry and government personnel. Graduate students provide topical insights in significant methods and results of current research in operations research.

ORES 801 OPERATIONS RESEARCH PRINCIPLES 3
Models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queueing theories, maintenance and replacement of equipment and government planning. Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems.
COREQ: MATH529, STAT601 or MATH630

ORES 802 OPERATIONS RESEARCH APPLICATIONS 3
Applications of models and principles of basic interest to the theory and practice of operations research. Classic models of inventory and queueing theories, maintenance and replacement of equipment and government planning. Contemporary models from research literature of energy management, urban planning, artificial intelligence and flexible manufacturing systems.
COREQ: MATH529, STAT601 or MATH630

ORES 806 RESEARCH TECHNIQUES AND PROCEDURES 3
See FREC806 for course description

ORES 810 INTERNATIONAL AGRICULTURAL TRADE SPECIAL TOPICS 3
See FREC810 for course description

ORES 827 ADVANCED PRODUCTION ECONOMICS 3
See FREC827 for course description

ORES 834 SEMINAR IN RESOURCE ECONOMICS 3
See FREC834 for course description.

OES 886 RESEARCH 1-6

OES 896 MASTER'S THESIS 1-6

OES 964 PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy

OES 969 DOCTORAL DISSERTATION 1-12 PF

PHILOSOPHY

PHIL 100 PHILOSOPHIES OF LIFE 3
Survey of selected past and present philosophies that people strive to live by, typically including individualistic, group-oriented, religious and nonreligious positions

PHIL 101 GREAT WESTERN PHILOSOPHERS 3
Survey of the key ideas of great Western philosophers concerning the nature of reality and how it is known. Focus on individual philosophers such as Plato, Aristotle, Descartes, Kant, Hegel, James and Wittgenstein

PHIL 102 INTRODUCTION TO PHILOSOPHY 3
An examination of such central philosophical problems as ethics, theories of knowledge, the nature of reality, philosophy of religion and political philosophy.

PHIL 105 CRITICAL THINKING 3
Emphasis on developing skill at logical criticism of arguments. Topics include informal fallacies, deceiving with statistics, the role of definitions in reasoning, the importance of evidence and confirmation

PHIL 109 MODERN RELIGIOUS ISSUES 3
The biblical world view and modern science, controversies over the nature of Scripture, doctrines of religious authority, the nature of theological language and existentialist interpretations and myth

PHIL 125 TOPICS: PHILOSOPHY IN POPULAR CULTURE 1-6
Philosophical ideas expressed in popular media such as science fiction or fantasy literature, films and music. Topics are variable.
RESTRICTIONS: May be repeated for up to four credit hours

PHIL 200 BUSINESS ETHICS 3
Ethical theory applied to moral problems in business. Corporate social responsibility, and ethical issues in advertising, personnel and investment

PHIL 201 SOCIAL AND POLITICAL PHILOSOPHY 3
Classical and contemporary views on such problems as the proper scope and functions of government, on what a just distribution of wealth is, and on the extent of an individual's rights, liberties and obligation to obey the law

PHIL 202 CONTEMPORARY MORAL PROBLEMS 3
The application of philosophical techniques to contemporary moral problems such as abortion, punishment, biomedical ethics, reverse discrimination and sexual morality. May be cross-listed with WOMS203

PHIL 203 ETHICS 3
Study of moral values, moral obligation and moral virtue through comparison of notable schools of ethical theory, including utilitarianism, existentialism, Kantianism, classical Greek eudaimonism, pragmatism and Thomism

PHIL 204 WORLD RELIGIONS 3
Varieties of religious belief and practice from diverse cultures, including representative Asian and Western traditions, studied mainly in terms of their historical development and importance

PHIL 205 LOGIC 3
Concepts and techniques of elementary symbolic logic: truth and consistency of sentences, validity and soundness of arguments; translation of English sentences into a formal language; construction of truth tables and the use of a system of natural deduction to prove the validity of deductive arguments

PHIL 207 SCIENTIFIC REASONING 3
Critical survey of basic concepts and forms of inductive reasoning. Applications to the physical, social and biomedical sciences. Topics include: interpretations of probability, probabilistic fallacies, methods of statistical induction, logic of hypothesis testing, judging correlations, criteria of causation, experimental design and definitions of confirmation

PHIL 208 INTRODUCTION TO JEWISH PHILOSOPHY 3
Fundamental issues in philosophy of religion reflecting both general theological approaches to resolving the tension between philosophy and religion and the uniquely Jewish attempt to do so. Topics include: God, miracles, good and evil, divine commandments and free will. May be cross-listed with JWST208

PHIL 209 PHILOSOPHY OF RELIGION 3
Religious experience, proofs for God's existence, religious language and critiques of religion. Selected special topics such as mysticism, evil, atheism, miracles, immortality and myth

PHIL 210 WOMEN AND RELIGION 3
See WOMS210 for course description

PHIL 211 BASIC DECISION THEORY 3
Rational decision-making using only elementary logic and high-school algebra. Decisions under ignorance: maximin rules for preference orderings. Decisions under risk: probability, utility, and the expected-utility rule. Game theory: equilibrium strategies; prisoner's dilemma. Social choices; voting paradoxes and Arrow's theorem

PHIL 216 INTRODUCTION TO FEMINIST THEORY 3
The concepts of love, marriage, sexuality, family, work, power and equality of women. Theories of women and their position in society, including classical Marxism, the status politics of the suffragettes, radical feminism and socialist feminism. May be cross-listed with WOMS216

PHIL 218 MIND, ESP AND SURVIVAL 3
An exploration of major philosophical conceptions of the relation of mind (soul) and brain. Implications for the nature of mind from the literature of psychic research and immortality

PHIL 229 THE NATURE OF SCIENCE 3
See CSCC229 for course description

PHIL 241 ETHICAL ISSUES IN HEALTH CARE 3
See CSCC241 for course description

PHIL 244 PHILOSOPHY OF ART 3
An introduction to major aesthetic problems concerning art: the nature, evaluation and value of art

PHIL 246 PHILOSOPHICAL PERSPECTIVES OF MEDICINE 3
See CSCC246 for course description

PHIL 250 ENGINEERING ETHICS 3
Concrete ethical problems in engineering practice, both professional/entrepreneurial and in industrial research settings. Other topics include the social responsibilities of engineering societies. May be cross-listed with CSCC250

PHIL 301 ANCIENT PHILOSOPHY 3
Beginnings of Western science and philosophy. The pre-Socratic, Sophists, Socrates, Plato, Aristotle, the Epicureans, Stoics and Skeptics
PHIL 302 MEDIEVAL PHILOSOPHY 3
Christian European philosophy from the 4th to the 14th century; Augustine and early
medieval thought; Aquinas and the 13th century; Ockham and the rise of nominalism.
Problems such as the relation between faith and reason, the possibility of demonstrating
God's existence and the status of universals

PHIL 303 MODERN PHILOSOPHY 3
Scientific and the birth of Modernity. Bacon and scientific experimentalism; Hobbes
materialism, Descartes, Spinoza and Leibniz; Locke, Berkeley, Hume and Kant; and the
Age of Enlightenment and its impact on philosophy, science and religion

PHIL 304 NINETEENTH-CENTURY PHILOSOPHY 3
Major philosophies of the 19th century with special emphasis on Hegel and Nietzsche

PHIL 305 TWENTIETH-CENTURY PHILOSOPHY 3
Major philosophical movements from the 20th century to the present. Includes logical
empiricism and the recent criticism of this movement

PHIL 307 BLACK THOUGHT AND PHILOSOPHY 3
See BAM307 for course description

PHIL 309 INDIAN RELIGION AND PHILOSOPHY 3
The Vedas, Upanishads, and Bhagavad-Gita; Sankhya, Yoga, Nyaya, Vaisheshika and
Mimamsa; Jainism and Indian Hinayana and Mahayana Buddhism; Vedanta and modern
developments such as Aurobindo

PHIL 310 CHINESE RELIGION AND PHILOSOPHY 3
Ancient China: Confucianism, Taoism and the 100 Schools. The Buddhist conquest of
China: Buddhism in China and Chinese Buddhism, Medieval Synthesis: Neo-
Confucianism. The Response to the West: Maximo and Modern Confucianism

PHIL 315 METAPHYSICS 3
Examination of central issues in metaphysics. Sample topics: universals and particulars,
possibility and necessity, identity over time, free will, causality, and the philosophy of
time
PREREQ: One philosophy course

PHIL 317 AMERICAN PHILOSOPHY 3
Classical American philosophers, including Emerson, Thoreau, Peirce, James and Dewey.
Includes ethics, epistemology and social and political theory

PHIL 320 THEORY OF KNOWLEDGE 3
An examination of some central issues in epistemology: classical and contemporary anal-
yses of empirical knowledge; the nature of justification and rationality; implications for sci-
ence, religion and metaphysics

PHIL 322 EXISTENTIALISM 3
Study of the origins and development of existential philosophy. Emphasis on the funda-
mental insight into the nature of man that separates the existentialists from the rest of the
Western philosophical tradition. Sources include Pascal, Kierkegaard, Nietzsche and
Sartre

PHIL 330 PHILOSOPHY OF MIND 3
Coverage of central issues in the philosophy of mind including such topics as the relation
between mind and body, the nature of thought, consciousness, perception, personal iden-
tity and the relation of cognitive psychology, neuroscience and computer science to the
philosophy of mind. May be cross-listed with CSC310

PHIL 340 CROSS-CULTURAL ENVIRONMENTAL ETHICS 3
Critical and global study of the ethics of human-environment relations as suggested by the
science of ecology. Western philosophy, physical science, the world views of Judaism,
Christianity, Islam, Hinduism, Buddhism, Taoism, Native American traditions, African tra-
ditions ecocentricism and American law

PHIL 341 ETHICS OF ENGINEERING PROFESSION 3
Introduction to cases involving engineers' moral responsibilities; emphasis on making rea-
sable ethical choices. May be crosslisted with CSC314

PHIL 345 PHILOSOPHY OF HISTORY 3
Nature and limits of our knowledge of the past: categories of explanation used by histor-
ians and the aim of historical inquiry. Speculation about the "meaning of" history and the
structure of historical process

PHIL 360 HUMANITIES COLLOQUIUM 3
See ARSC360 for course description. May be cross-listed with ENGL360

PHIL 366 INDEPENDENT STUDY 1-3

PHIL 389 TOPICS: WOMEN AND HEALTH ISSUES 3
See WOMS 389 for course description

PHIL 390 HONORS COLLOQUIUM 3
See ARSC390 for course description. May be crosslisted with WOMS390

PHIL 392 HONORS COLLOQUIUM 3
Racism, sexism and speciesism. May be crosslisted with WOMS392

PHIL 444 MEDICAL ETHICS 3
Seminar focuses on such topics as experimentation with human subjects, genetic engi-
neering and the moral problems of health care. May be cross-listed with CSCC444
RESTRICTIONS: For students of philosophy and health professions

PHIL 448 ENVIRONMENTAL ETHICS 3
Ethical problems associated with environmental protection, local, national, and interna-
tional: Relations to social and political movements. Seminar format

PHIL 454 PHILOSOPHY OF SOCIAL SCIENCE 3
Critical examination of the central historical and contemporary questions about the con-
cepts, methods, social structure and purposes of social science inquiry. May be cross-list-
ated with ANTH465
PREREQ: A theory of methodology course in a social science, or an epistemology or phi-
losophy of science course

PHIL 463 ETHICAL THEORY 3
Justification of ethical beliefs, alternative criteria of moral rightness and the meaning of
moral concepts
PREREQ: PHIL202 or PHIL203

PHIL 465 SENIOR SEMINAR 3
Various authors and themes; e.g., Plato, Kant, epistemology, philosophy of mind.
RESTRICTIONS: May be repeated once for credit when topics vary

PHIL 466 INDEPENDENT STUDY 1-3

PHIL 467 PHILOSOPHY OF TECHNOLOGY 3
Philosophical reflections on working tools in the broadest sense; definitions, studies of
processes, products and uses, and ethical, cultural and political critiques. Seminar for-
may be cross-listed with CSCC647, MAIS647 and/or UAPP647

PHIL 468 ENVIRONMENTAL ETHICS 3
Ethical problems associated with environmental protection, local, national, and interna-
tional: Relations to social and political movements. Seminar format. May be cross-listed
with MAIS648 and/or UAPP648

PHIL 868 RESEARCH 1-3
A detailed study of certain philosophical problems with special reference to research
problems under way in the department

PHYSICS AND ASTRONOMY

Phys 104 Elementary Physics 3
Overview of the principles of physics and their applications. Course is designed for begin-
ners with no previous exposure to physics
RESTRICTIONS: Requires working knowledge of algebra and the use of scientific nota-
tion. Only one course among PHYS101, PHYS104, PHYS201, PHYS207 and
SCEN101 can count toward graduation

Phys 133 Introduction to Astronomy 4
Objects of the universe from the earth to galaxies. How the universal laws that govern them;
e.g., gravity and electromagnetic radiation, permit us to learn about the nature of quantitative
observations: Telescopic observations, visual and electronic, included in the laboratory

Phys 139 Star and Constellation Identification 1
Familiarity with the sky, its changing aspects, constellations, mythology, bright stars, and
planets. Topics will include use of sky maps and coordinates, how to estimate directions
and time from knowledge of the sky, and the use of binoculars and small telescopes

Phys 140 Great Concepts of Physics 3
Designed for non-science majors, will concentrate on understanding both the content and
impact of five great concepts of physics: the Newtonian Universe, Conservation of
Energy, Entropy, Relativity, and Wave-Particle Duality. The influence of these concepts in
other areas of human concern, e.g., philosophy, art, history, politics, medicine, etc will
be an important feature

Phys 141 Light, Lasers, Cameras, Perception 3
Introduction to the phenomena of light, optics and perception for non-science majors.
Topics include: nature of light, sources of light and shadows, rainbows, mirages and other
atmospheric phenomena, cameras, telescopes, microscopes, color creation and percep-
tion, physics influences in art, the human eye and perception

Phys 143 Energy Technology and Society 3
Basic principles of physics are applied to discuss forms of energy (mechanical,thermal, chem-
ical, electrical and nuclear), and how energy is derived from sources such as coal, petroleum,
solar, nuclear fission and fusion. Environmental consequences of energy use are treated
PREREQ: College algebra

Phys 144 Concepts of the Universe 3
Survey of astronomy emphasizing early and modern concepts. Stars, planets, galaxies,
occlusive evolution and intelligent life are studied in the context of physical principles which
describe the dynamics of the universe. Scientific process is used to interpret observations
that shape our perceptions of the cosmos
RESTRICTIONS: Not for credit to students who have taken PHYS133 or PHYS134.
PHYSICS AND ASTRONOMY

PHYS 145 QUASARS, BLACK HOLES AND THE UNIVERSE 3
A non-mathematical course focusing on the role of explosions and other violent events in the universe. The major topics are Einstein's theory of special relativity, black holes, galaxies, exploding galaxies, quasars, the expanding universe, pulsars, supernovae and x-ray stars.

PHYS 146 QUARKS, GLUONS, AND THE BIG BANG: PARTICLES AND COSMOLOGY 3
Non-mathematical course focusing on the elementary particles and their influence on the early evolution of the universe. Major topics are quarks and the forces they feel, Einstein's theory of relativity, Quantum Mechanics made fairly simple, and the Inflationary Universe.

PHYS 147 ATOMS FOR EVERYONE 3
Elementary but earnest inquiry into the sources of our knowledge that these completely invisible building blocks of ordinary matter exist as discrete entities, and exist to the exclusion of all other possibilities.

PHYS 199 EXPLORING PHYSICS CONCEPTS 1 3
Exploration of physics concepts for first year students with no prior physics background. Emphasis on physics of light, color, electrical circuits and structure of matter.

PHYS 201 INTRODUCTORY PHYSICS I 4
First course in a two-part sequence with PHYS202 which provides a comprehensive introduction to physics for students in physical, biological, health, and environmental sciences. Topics include: geometrical optics, rectilinear mechanics, fluid, and thermodynamics.

PHYS 202 INTRODUCTORY PHYSICS II 4
Second course in a two-part sequence with PHYS201 which provides a comprehensive introduction to physics for students in physical, biological, health, and environmental sciences. Topics include: rotational and oscillatory motion, waves, electricity and magnetism, structure and properties of nuclei, atoms, molecules and solids.

PHYS 207 FUNDAMENTALS OF PHYSICS I 4
Calculus-based introduction to physics, with primary emphasis on mechanics. Integrates conceptual understanding with extensive problem solving and laboratory experience.

PHYS 208 FUNDAMENTALS OF PHYSICS II 4
Calculus-based introduction to physics, with primary emphasis on electricity and magnetism. Integrates conceptual understanding with extensive problem solving and laboratory experience.

PHYS 209 FUNDAMENTALS OF PHYSICS III 3
Calculus-based introduction to waves and quantum physics. Material on waves will include the damped and undamped harmonic oscillator, mechanical and electromagnetic waves, and the basics of Fourier series. The quantum physics material will include the Bohr model, diffraction and interference of electrons, photoelectric effect, blackbody radiation, Compton scattering, and the interpretation of the Schrodinger equation.

PHYS 210 INTRODUCTION TO THERMAL PHYSICS 3
Basic concepts of thermodynamics including properties of substance, first and second law analysis of systems and control volumes, entropy and availability. Power and refrigeration cycles.

PHYS 306 COMPUTATIONAL METHODS OF PHYSICS 3
Treats the application of various mathematical methods to various subfields of physics. Shows the use of selected analytical and numerical methods in all branches of physics, emphasizing the use of similar methods in different areas of physics.

PHYS 313 PHYSICAL OPTICS 4
Introduction to optics at an intermediate level with emphasis on physical concepts and the properties of waves. Appropriate for physics as well as engineering students and others with a physical science background.

PHYS 345 INTRODUCTION TO ELECTRICITY AND ELECTRONICS 4
Fundamentals of electricity and magnetism specific to dc and ac circuit analysis, transient circuit behavior, and rotating machinery. Fundamentals of analog and digital electronics, with emphasis on applications in engineering. Integrated circuits and operational amplifiers.

PHYS 419 CLASSICAL MECHANICS I 3
Intermediate course which emphasizes the fundamental principles of classical mechanics. Treats in detail and with mathematical rigor, particle mechanics, conservation laws, harmonic oscillation, motion under central force, rigid body dynamics, and moving coordinate systems.

PHYS 424 QUANTUM MECHANICS 3
Introduces quantum mechanical concepts by reviewing experiments which cannot be explained by classical physics. The Schrodinger equation is solved for simple cases such as free-particle motion, the simple harmonic oscillator and the hydrogen atom, with a basic treatment of angular momentum. May be cross-listed with CHEM424 and/or ELEG424.

PHYS 449 INTRODUCTION TO RESEARCH 1-6
Undergraduate research on an assigned problem carried out under the supervision of the staff.

PHYS 600 PHYSICS RESEARCH TALKS 1 PF
Lectures by Physics faculty describing their current research to aid graduate students in selection of an area of thesis research.

PHYS 601 INTRODUCTION TO TEACHING PHYSICS AND ASTRONOMY I PF
Introduction to the methods and techniques of teaching and tutoring physics at a level appropriate for teaching assistants and tutors of undergraduate courses in Physics and Astronomy. Discussion and workshop formats will be used during the course.

PHYS 603 ELECTRICITY AND MAGNETISM I 3
First course in a two-part sequence with PHYS604 which provides a detailed treatment of electrostatics and magnetostatics at the intermediate level. Topics include: Maxwell's equations in the static limit, multipole expansions, capacitors and electrostatic energy, analytical and numerical solutions to boundary-value problems, dielectric and magnetic media, and steady currents.

PHYS 604 ELECTRICITY AND MAGNETISM II 3
Second course in a two-part sequence with PHYS603 which provides a detailed treatment of electromagnetic theory at the intermediate level. Maxwell's equations are developed and applied to electromagnetic waves in vacuum, material media, and wave guides. Includes application to electromagnetic radiation and special relativity.

PHYS 607 METHODS OF MATHEMATICAL PHYSICS 3
Mathematical subjects commonly employed in physics with examples taken from physics. Linear vector spaces: Fourier series, orthogonal function expansions and eigenvalue problems.

PHYS 608 METHODS OF MATHEMATICAL PHYSICS 3
Mathematical subjects commonly employed in physics with examples taken from physics. Complex variables and asymptotic analysis.

PHYS 610 QUANTUM MECHANICS 3

PHYS 616 KINETIC THEORY AND THERMODYNAMICS 3
Postulates of equilibrium thermodynamics; review of relevant mathematics; entropy maximun principle; energy minimum principle; Legendre transformations. Entropy representation; internal energy representation; Helmholtz representation and Gibbs representation. Maxwell relations; reduction of partial derivatives; phase transitions; statistical mechanics via Boltzmann's elementary method; equipartition of energy; applications. May be cross-listed with ELEG616.

PHYS 646 INDEPENDENT STUDY 1-3
PHYS 647 INDEPENDENT STUDY 1-3

PHYS 699 DISCUSSION AND WORKSHOP 1-3
PHYS 620 Classical Mechanics II 3
Topics covered are Lagrangian and Hamiltonian dynamics, dynamics of systems of parti-
cles, rigid bodies and fluids, oscillations of systems of coupled particles, oscillations and
waves in continuous systems. Provides a classical introduction to techniques that are used
extensively in quantum and statistical physics
PREREQ: MATH302 and PHYS419

PHYS 621 Fundamentals of Modern Physics 3
Comprehensive and critical discussion of the phenomenological bases of atomic, elec-
tronic, and nuclear physics and their assimilation into a wave mechanical view of the
microscopic world
PREREQ: MATH302

PHYS 624 Introduction to Solid State Physics 3
X-ray diffraction, structure and properties of metals, insulators and semiconductors, and
band theory of solids. Includes electrical, optical, magnetic and thermal properties
PREREQ: PHYS616 and PHYS621

PHYS 631 Acoustics 3
Vibrations of particles, strings and membranes; acoustic waves, radiation of sound; room
acoustics; and acoustic measurements
PREREQ: MATH302

PHYS 632 Astrophysics 3
Survey of diverse astronomical objects and the physical principles used in modeling them.
Emphasis on the observational basis and foundations of astrophysics. Stellar magnitudes,
colors and spectra; the HR diagram; solar and stellar activity; binary stars; the pheno-
mena of galactic and extragalactic astronomy
PREREQ: MATH302 plus 14 hours of physics

PHYS 633 Introduction to Stellar Astrophysics 3
Introduction to the physics of stellar interiors and atmospheres. The evolution of stars is
explored by studying the changes in internal composition due to nuclear reactions. The
physical processes underlying stellar spectra are investigated. Computer simulations of
stars and their atmospheres may be used
PREREQ: PHYS652 and MATH302

PHYS 638 Selected Topics in Physics 3
Treatment of a specialized subject taken from the following list: particle astrophysics, mag-
netic materials, electron microscopy, elementary particles, cosmology, solar physics and
other advanced topics
RESTRICTIONS: May be repeated for credit when topics vary

PHYS 645 Electronics for Scientists 3
Fundamentals of analog and digital electronics, with emphasis on applications in science.
Circuit analysis, operational amplifiers, filters, gates, flip-flops, counters, analog to digital
and digital to analog converters
PREREQ: PHYS602 or equivalent

PHYS 646 Instrumentation for Scientists 3
Electronic measurements and instrumentation with emphasis on applications in science.
Amplication, noise, low-level signal recovery, lock-in amplifiers, digital signal averaging,
frequency and time measurements, transducers, bridges, interfacing to laboratory com-
puters, and automation of experiments
PREREQ: PHYS608 and PHYS645 or equivalents

PHYS 803 Solid State Physics 3
Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties
of solids; and imperfections in crystals
PREREQ: PHYS624

PHYS 809 Electromagnetic Theory 3
Review of statics: Maxwell’s equations, physical optics and wave guides. May be cross-
listed with ELEG809
PREREQ: PHYS604

PHYS 810 Electromagnetic Theory 3
Geometric optics, limit of Maxwell’s equations, Liénard-Wiechert fields, radiation fields,
radiation damping, Wheeler-Feynman theory. May be cross-listed with ELEG810
PREREQ: PHYS604 and PHYS809

PHYS 811 Quantum Mechanics 3
Continuation of PHYS810. Approximation methods. Introductory scattering theory. Spin
matrix formulation of quantum mechanics. Applications to atoms, molecules, nuclei and
nuclei
PREREQ: PHYS607 and PHYS610
COREQ: PHYS508

PHYS 812 Quantum Mechanics 3
Continuation of PHYS811. Approximation methods. Symmetries. Semi-classical radiation
theory. Identical particles and many-particle wave functions. Collision theory. Applications
to atoms, molecules, nuclei and crystals
PREREQ: PHYS811

PHYS 813 Statistical Mechanics and Thermodynamics 3
Review of equilibrium thermodynamics and probability theory. Kinetic theory including the
Boltzmann equation. Gibbsian ensemble theory in classical and quantum statistical
mechanics. Classical ideal gases with internal degrees of freedom. Dissociation equilibri-
um. The ideal Bose and Fermi gases with elementary applications to fluids and solids
May be cross-listed with ELEG813
PREREQ: PHYS616

PHYS 815 Theory of Relativity 2-3
Crisis of the special theory introductory to the general theory: physical basis of the gen-
eral theory; Einstein’s field equations; and problems of gravitational motion and radiation
PREREQ: PHYS809

PHYS 817 Advanced Classical Dynamics 3
Theoretical treatment of advanced classical mechanics
PREREQ: PHYS620

PHYS 838 Advanced Treatment of Selected Topics 3
Selected topics taken from the following list: quantum field theory, renormalization group
and critical phenomena, nuclear theory, elementary particles and applications of group
theory in physics
RESTRICTIONS: May be repeated for up to six credit hours when topics vary

PHYS 862 Solid State Seminar 1
Lectures and discussions by faculty and students on specialized topics in solid state
physics

PHYS 868 Research 1-9

PHYS 869 Master’s Thesis 1-6

PHYS 964 Pre-Candidacy Study 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examina-
tions for doctoral students before admission to candidacy but after completion of all
required course work
RESTRICTIONS: Not open to students who have been admitted to candidacy

PHYS 969 Doctoral Dissertation 1-12 PF
PHYSICAL THERAPY

PHYT 608  MUSCULOSKELETAL EVALUATION AND TREATMENT  3
Indepth analysis of evaluation and treatment strategies of spinal and extremity joints, mus-
cles and connective tissue. Emphasizes research on the physiological basis of traction, mobilization and exercise.
PREREQ: PHYT604, PHYT622 and PHYT604
RESTRICTIONS: Open to MPT Program students only.

PHYT 609  NEUROPHYSIOLOGICAL EVALUATION AND TREATMENT  3
Indepth analysis of evaluation and treatment strategies of neurologicallyinvolved patients.
Emphasizes research on the physiological basis of traction, mobilization and exercise.
PREREQ: All first-year MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 610  PSYCHOSOCIAL ASPECTS OF DISABILITIES  2
Discusses the psychosocial characteristics of patient populations and therapists that impact on the rehabilitative process. Time management, death and dying, sexuality, love and hate and other topics are discussed.
PREREQ: All previous MPT courses.

PHYT 611  CLINICAL MANAGEMENT PRACTICES  1
Discusses concepts of administration and issues in the management of hospital clinics, private practice and consultative ventures.
PREREQ: All first-year MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 612  CLINICAL MANAGEMENT PRACTICUM  3
Full- or part-time practicum in a management setting. Advances skills in management.
PREREQ: All previous MPT courses.

PHYT 613  ADVANCED ORTHOPEDICS  3 PF
Discusses various schools of orthopedic intervention.
PREREQ: All previous MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 614  SPORTS PHYSICAL THERAPY  3 PF
Analyzes the various competencies required in the practice of sports physical therapy. Clinical skill acquired.
PREREQ: All previous MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 615  ADVANCED NEUROTHERAPEUTICS  3
Discusses an integration of the various neurodevelopmental approaches to the treatment of the neurological patient.
PREREQ: All previous MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 616  PEDIATRICS SEMINAR  3 PF
Discusses selected problems encountered by the pediatric population. Studies the evaluation, treatment and research basis of these problems.
RESTRICTIONS: Open to MPT Program students only.

PHYT 617  PATIENT MANAGEMENT II  3
Continuation of PHYT 602. Teaches the theory and skills necessary for the physical therapy management of patients commonly seen in rehabilitation settings.
PREREQ: PHYT602.
RESTRICTIONS: Open to MPT Program students only.

PHYT 618  LIFE SPAN DEVELOPMENT  3
A study of human development and aging from birth through death. Emphasis on motor, sensory and cognitive functions and dysfunction.
PREREQ: All first-year MPT courses.

PHYT 619  ADVANCED SEMINAR  2
Lectures pursue various topics in greater depth and develop advanced clinical skills. Examples include burn and wound care, hand therapy, geriatrics and obesity. Individualized clinical experiences may be arranged.
PREREQ: All previous MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 620  EDUCATIONAL PROCESS IN COMMUNITY HEALTH  1
Focuses on the learning/teaching process for application to the teaching roles of the health professional.
RESTRICTIONS: Open to MPT Program students only.

PHYT 621  PRACTICE CLINIC  1 PF
Student participation in faculty practice clinic treating referrals for physical therapy. All students participate in the clinic at least one semester.
RESTRICTIONS: Open to MPT Program students only.

PHYT 622  CLINICAL GROSS ANATOMY  6
Emphasis on structural and functional aspects of regions of body under study by means of human cadaver, lectures and demonstrations. Stresses clinical significance of anatomical structure.
RESTRICTIONS: Open to first-year physical therapy graduate students only.

PHYT 623  CLINICAL NEUROSCIENCES  4
A study of the structure and function of the human nervous system with major emphasis on the cause-effect relationships between lesions and their symptoms. Emphasis on the neural mechanisms controlling movement.
PREREQ: PHYT622.

PHYT 624  INTRODUCTION TO EVALUATION  1
Provides the student with an understanding of the philosophy and practice of patient evaluation and physical therapy diagnosis. Muscle performance testing and measurement of joint motion of the extremities will be emphasized.
RESTRICTIONS: MPT Program students only.

PHYT 626  ADVANCED REGIONAL ANATOMY  3 PF
Structural and functional aspects of regions of the body under study are emphasized by means of a dissection of a specific region of the human body.
PREREQ: PHYT622.

PHYT 801  MEDICAL SCIENCE I  2
Lectures in pathology, clinical medicine, cardiology and pharmacology.
RESTRICTIONS: Open to MPT Program students only.

PHYT 802  MEDICAL SCIENCE II  2
Lectures in orthopedics, radiology and rheumatology.
PREREQ: All previous MPT courses.

PHYT 803  MEDICAL SCIENCE III  2
Lectures in neurology, pediatrics, geriatrics and other medical specialties as required.
PREREQ: All previous MPT courses.
RESTRICTIONS: Open to MPT Program students only.

PHYT 888  RESEARCH  1-9
PREREQ: All previous MPT courses.
RESTRICTIONS: Requires permission of instructor.

PHYT 889  MASTER'S THESIS  1-6
PREREQ: All previous MPT courses.
RESTRICTIONS: Requires permission of instructor.

PLANT AND SOIL SCIENCES

PLSC 100  PLANTS AND HUMAN CULTURE  3
Historical survey of interrelationships between plants and diverse human cultures. Examines Asian, African, Mediterranean, North/South American peoples (ancient and modern) to provide a broad multicultural perspective and commentary on modern American values about plants and their environment.

PLSC 101  BOTANY I  4
Introductory botany stressing fundamental concepts and processes in plants. Topics include cell structure and function, anatomy, genetics, reproduction, physiology, taxonomy, phylogeny and ecology.

PLSC 105  INTRODUCTORY FORESTRY  3
Distribution, ecology, value, measurement and management of forest systems.
PREREQ: PLSC101.

PLSC 133  ORNAMENTAL HORTICULTURE  3
The use of ornamental plants. Emphasis on a basic knowledge of plant materials useful in maintaining an aesthetically and functionally pleasing environment in and around the home.

PLSC 151  INTRODUCTION TO CROP SCIENCE  3
Plant structure and plant processes with practical application to the production and management of commercial crops.
RESTRICTIONS: Credit not allowed if preceded by PLSC401.

PLSC 154  TOPICS IN PRODUCTION AND MANAGEMENT OF ORNAMENTAL PLANTS  1-6
Topics combine theory and practice in the areas of turf and ornamental horticulture.
RESTRICTIONS: Not for major credit except as elective.

PLSC 170  SOILS AND ENVIRONMENTAL QUALITY  3
Role of soils in contemporary environmental problems, including the nature and causes of soil, air and water pollution; soil management practices to minimize environmental impacts of nutrients, pesticides, agricultural and industrial wastes, and contaminated soils; risk management strategies needed to develop environmental management programs.

PLSC 171  NEW STUDENT COLLOQUIUM  1
Focus on academics, careers and resources as important components in achieving success in the plant and soil sciences. Practical skills, helpful in mastering the first year in the plant and soil sciences majors.
RESTRICTIONS: Open to first year majors only.
PLSC 201 Botany II 4
Sexual and vegetative characters of algae, bacteria, fungi, liverworts, mosses, ferns, horsetails, club mosses, quillworts, gymnosperms and angiosperms. Selected genera within these divisions considered in detail
PREREQ: PLSC101 or BISC207

PLSC 204 Introduction to Soil Science 4
Fundamentals of soil including origin, composition and classification; physical, chemical and biological properties; significance of soil properties to use and management, and soil-plant relationships
PREREQ: CHEM101

PLSC 211 Herbaceous Landscape Plants 3
Survey of herbaceous plants including annuals, perennials and bulbs; plant identification, culture, selection, design and maintenance in the landscape
PREREQ: PLSC133

PLSC 212 Woody Landscape Plants 4
The study of woody plants for landscape use in the mid-Atlantic coastal region, including plant identification, selection and culture
PREREQ: PLSC133

PLSC 213 Turf Establishment and Maintenance 4
Factors affecting the establishment and maintenance of fine and utility turf; emphasis on the management of golf courses, athletic fields and sod farms

PLSC 270 Biotech Science and Socioeconomic Issues 3
See ANSC270 for course description

PLSC 300 Principles of Animal and Plant Genetics 3
See ANSC300 for course description

PLSC 302 Vegetable Science 3
Basic factors affecting productivity and marketability of vegetable crops

PLSC 303 Introductory Plant Pathology 4
Introduction to the nature, causes, development, effects and control of plant disease. Laboratory involves microscope use for examining plant disease specimens and fungal structures, and experience in isolation and culture of pathogenic fungi
PREREQ: PLSC201 or BISC207

PLSC 305 Environmental Soil Management 4
Practical application of the basic principles of soil chemistry, physics and microbiology to modern land use programs. Covers basic principles of nutrient management (availability and cycling in soils, roles in plant nutrition), soil acidity and liming, soil testing, environmental fate of non-essential elements and organic chemicals, and role of risk assessment in soil management
PREREQ: CHEM102 and PLSC204

PLSC 306 Introduction to Plant Molecular Biology 3
The molecular biology of higher plants, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering
PREREQ: BISC207, CHEM102

PLSC 310 Animal and Plant Genetics Laboratory 1
See ANSC310 for course description

PLSC 319 Environmental Soil Microbiology 4
Introduction to soil microbiology and biochemistry as related to environmental issues: microbial diversity and ecology in soil/plant systems, transformations of natural and synthetic organic compounds, biocycling of nutrients and metals, bioremediation. Introduction to laboratory methods for studying soil microorganisms and associated processes
PREREQ: PLSC204 and CHEM102

PLSC 331 Landscape Construction II 4
Introduction to principles involved in contour grading, site drainage, design of landscape features and methods of construction related to landscaping

PLSC 332 Basic Landscape Design 4
Application of design principles to actual field problems, drafting and presenting techniques
PREREQ: PLSC212

PLSC 364 Landscape Horticulture Internship 1-6
Supervised, faculty-monitored, career-related experience in one or more aspects of the ornamental horticulture industry
PREREQ: PLSC133

PLSC 366 Independent Study 1-6

PLSC 401 Agronomic Crop Science 3
Production and management of the major grain and forage crops, with emphasis on diagnosis of production problems and decision making
PREREQ: PLSC151

PLSC 402 Plant Taxonomy 3
Identification, classification and nomenclature of vascular plants, including eight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U S
PREREQ: PLSC201

PLSC 403 Nursery and Garden Center Management 4
Production, maintenance and marketing of plants relative to the establishment and management of a nursery or garden center
PREREQ: PLSC101 or PLSC151

PLSC 410 Introduction to Plant Physiology 3
The physiology of green plants: light and energy conversion, carbon fixation, nitrogen metabolism, amino acid synthesis, protein synthesis mechanisms and regulation, water and solute utilization, nutrient translocation, photomorphogenesis and photoperiodism and growth hormones, considered at the fundamental level of operation
PREREQ: PLSC201 or BISC208, and CHEM213

PLSC 411 Diagnostic Plant Pathology 3
Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control
PREREQ: PLSC303

PLSC 413 Principles of Plant Disease Control 3
Principles of plant disease control by exclusion, eradication and resistance. Plant protection with emphasis on fungicides, bactericides, and nematocides and their use
PREREQ: PLSC303

PLSC 414 Plant Cell and Tissue Culture 4
Principles of culturing plants in vitro. Topics for both lecture and laboratory include cell suspensions, another culture, embryo rescue, micropropagation and regeneration via organogenesis and embryogenesis
PREREQ: PLSC101

PLSC 416 Plant Virology 4
Epidemiology, detection, identification and control of plant viruses and virus-like agents
PREREQ: PLSC303

PLSC 417 Greenhouse Management 4
Greenhouse structures, environmental control, cultural techniques and general management practices in greenhouse operations. Laboratory exercises supplement lecture material
PREREQ: PLSC201 and PLSC204

PLSC 420 Plant Physiology Laboratory 2
The extraction from higher plants of enzymes and other macromolecules, and assay by chemical tests. Pigment extraction, organelle separation, ion uptake, protein manipulation using centrifuge, spectrophotometer, chromatography and electrophoresis
PREREQ: PLSC410
COREQ: PLSC410

PLSC 422 Plant Propagation 3
Practical and physiological aspects of the propagation of economic plants including both sexual and asexual methods
PREREQ: PLSC201

PLSC 429 Introductory Mycology 4
A survey of the structure, classification and possible relationship of major groups of fungi with stress on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi
RESTRICTIONS: Requires permission of instructor

PLSC 431 Landscape Construction II 3
The application of the principles covered in PLSC331 to the solution of landscape construction, site drainage and grading problems, and construction documentation
PREREQ: PLSC331

PLSC 435 Plant Developmental Biology 3
An anatomical and molecular analysis of plant growth and development with a focus on how genes regulate pattern formation and cellular differentiation
PREREQ: PLSC300, PLSC306

PLSC 438 Fate/Transport Soil Contaminants 3
Fundamental concepts and mechanisms of contaminant fate and transport in porous media. Includes an overview of soil and groundwater as resources, types of soil and groundwater contaminants, transformation and attenuation of contaminants, solute transport in saturated and unsaturated systems
PREREQ: MATH221

PLSC 440 Integrated Pest and Disease Management 3
See ENTO440 for course description

PLSC 444 The Physiology of Plant Stress 3
The ways that green plants respond to biotic and abiotic environmental stresses: light, heat, cold, carbon dioxide, soil, drought, mineral nutrients and heavy metals, pathogens and herbivores, etc., at the physiological level
PREREQ: PLSC101
PLSC 450  Fine Garden Design 3
Comprehensive solution of landscape problems. Field application of principles of construction and design.
PREREQ: PLSC332

PLSC 454  Management of Landscape Enterprises 4
How to establish and finance a landscape management business; how to hire, supervise, evaluate, discipline and terminate personnel; how to manage time, select equipment, construct bids and contracts and maintain landscaped areas.
PREREQ: PLSC211 and PLSC212

PLSC 455  Issues in Horticulture 3
An introduction to current and emerging issues facing the horticultural professions. Ethics, professionalism, environment, politics, horticultural technology and practices will be the focus of discussion groups, student oral and written presentations, case studies, guest lecturers, and field trips.
RESTRICTIONS: Open to Junior and Senior majors only

PLSC 465  Seminar 1-6
Oral and written reports in one of the fields of plant science.

PLSC 466  Independent Study 1-6

PLSC 470  Weed Biology and Control 4
Introduction to weed science: weed biology and identification, survival strategies, competition, and impact of weeds. Weed management principles and practices including cultural, biological, and chemical control methods.
PREREQ: PLSC101 or PLSC151 or PLSC204

PLSC 601  Agronomic Crop Science 3
Production and management of the major grain and forage crops, with emphasis on diagnosis of production problems and decision making.
PREREQ: PLSC151

PLSC 602  Physiological Plant Productivity 3
PREREQ: PLSC410

PLSC 603  Soil Physics 3
See BREG603 for course description

PLSC 605  Plant Breeding 3
Improvement of crops through the application of genetic principles to breeding methods.
PREREQ: ANSC300 or PLSC300 or introductory genetics course
RESTRICTIONS: Includes at least two mandatory Saturday field trips.

PLSC 606  Soil Genesis and Classification 4
Soil forming factors and processes; chemical, physical and mineralogical parameters useful in characterizing soil; geologic and geomorphic settings in Delaware and their influence on soil formation and classification; soil taxonomy and soil limitations and interpretations.
PREREQ: PLSC204

PLSC 607  Plant and Soil Water Relations 3
Environmental aspects, measurement and control of water flow and storage in the soil-plant-atmosphere continuum; and development and significance of plant water deficits.
PREREQ: PLSC305 and PLSC410.

PLSC 608  Environmental Soil Chemistry 3
Principles of soil chemical reactions and their application to the environment including: inorganic and organic soil components, soil solution-solid phase equilibria, sorption phenomena, ion exchange reactions, kinetics of soil chemical processes, redox chemistry, soil acidity and salinity. May be cross-listed with CHEM608
PREREQ: CHEM102 or CHEM104 and PLSC204.

PLSC 609  Plant Microtechnique 4
Introduction to techniques useful in microscopically examining diseased and nondiseased plant structures. Emphasis on fixation, embedding, sectioning, staining and interpretation of prepared materials

PLSC 611  Diagnostic Plant Pathology 3
Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epidemiology, symptoms and control.
PREREQ: PLSC303

PLSC 613  Principles of Plant Disease Control 3
Exclusion, eradication, resistance and protection with emphasis on fungicides, bactericides and nematocides and their use.
PREREQ: PLSC303

PLSC 615  Vascular Plant Anatomy 3
A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current botanical literature.

PLSC 616  Plant Virology 4
The epidemiology, detection, identification and control of plant viruses and virus-like agents.
PREREQ: PLSC303

PLSC 619  Soil Microbiology 4
Characterization of microorganisms and microbial habitats in soil environments. Processes and interactions involving soil microorganisms with respect to agricultural productivity and environmental quality. Introduction to laboratory techniques for the observation, enumeration and isolation of soil microorganisms, and measurement of associat ed activities.

PLSC 620  Plant Physiology Laboratory 2
The extraction from higher plants of enzymes and other macromolecules, and assay by chemical tests. Pigment extraction, organelle separation, ion uptake, protein manipulation using centrifuge, spectrophotometer, chromatography and electrophoresis.
PREREQ: PLSC410
COREQ: PLSC410

PLSC 629  Introductory Mycology 4
Survey of the structure, classification and possible relationship of major groups of fungi with emphasis on representative organisms and a working knowledge of terminology. Practical laboratory experience in the culture and identification of fungi.
RESTRICTIONS: Requires permission of instructor

PLSC 640  Integrated Pest and Disease Management 3
See ENT6640 for course description

PLSC 644  The Physiology of Plant Stress 3
The ways that green plants respond to biotic and abiotic environmental stresses: light, heat, cold, carbon dioxide, salt, drought, mineral nutrients and heavy metals, pathogens and herbivores, etc., at the physiological level.
PREREQ: PLSC410

PLSC 650  Clay Mineralogy 3
See MAST650 for course description

PLSC 655  Pollution Microbiology 3
Integration of basic chemical, physical and biological processes that affect biotransformation of organic and inorganic pollutants in soils and subsurface sediments. Organization is based on a progression from molecular to field scale processes.
PREREQ: PLSC204, CHEM213, PLSC101 or BISE207

PLSC 660  Pesticides in the Environment 3
PREREQ: CHEM102

PLSC 670  Weed Biology and Control 4
Introduction to weed science: weed biology and identification, survival strategies, competition, and impact of weeds. Weed management principles and practices including cultural, biological, and chemical control methods.
PREREQ: PLSC101 or PLSC151 or PLSC204

PLSC 800  Current Topics in Plant Science 1-3
Discussion of selected topics and recent literature in plant science.

PLSC 801  Plant Science Techniques 3
Theories, principles and applications of laboratory techniques used in planning and conducting plant science research.
RESTRICTIONS: Requires permission of instructor

PLSC 802  Professional Development 1
Professional development including: grantmanship, manuscript writing and reviewing, resume preparation, job interviewing and presentation of research at professional meetings.

PLSC 803  Advanced Soil Fertility and Plant Nutrition 3
Analysis of chemical and biochemical factors involved in nutrient availability and transport in the soil. Evaluation of current theories of ion uptake, translocation and assimilation.
PREREQ: PLSC305 and PLSC410

PLSC 804  Plant Molecular Biology 3
Fundamental and applied aspects of plant molecular biology, including organization of plant genes, genomes, gene expression, gene transfer and genetic engineering.
PREREQ: ANSC670 or BISE653

PLSC 805  Insect-Plant Chemical Ecology 2
See ENT6065 for course description.
PLSC 810  KINETICS AND SURFACE CHEMISTRY OF SOILS  3
Kinetics and mechanisms of soil chemical reactions, including application of chemical
kinetics to natural systems, rates of sorption/desorption, redox, precipitation/dissolution,
and ion exchange processes and application of surface spectroscopic and microscopic
techniques to elucidate reactions at the soil mineral/water interface. May be cross-listed
with CHEM810.
PREREQ: PLSC608, and either CHEM418 or CHEM443
PLSC 814  ADVANCES IN PLANT TISSUE CULTURE  3
A review of current tissue culture literature supplemented with a historical perspective.
RESTRICTIONS: Requires consent of instructor
PLSC 819  ECOLOGICAL SOIL MICROBIOLOGY  3
Ecological principles of microbial activities and processes in soil-plant systems; dynamics
of soil and rhizosphere populations, symbiotic interactions with plants, and selected top-
ics in environmental quality.
PREREQ: PLSC619
PLSC 823  SEMINAR: PRINCIPLES OF PLANT INFECTION  2
The basic factors governing the development of plant infection by phytopathogenic organ-
sisms: invasion, parasitism, colonization, dissemination, epidemiology and host-parasite
relationships.
RESTRICTIONS: Requires permission of instructor
PLSC 831  TAXONOMY OF ORNAMENTAL PLANTS  3
Identification, considering the plant families that include the majority of the ornamental
plants grown in botanic gardens, arborece and horticultural institutions.
PLSC 832  BOTANIC GARDEN MANAGEMENT 1-10
A lecture and laboratory course conducted at Longwood Gardens to familiarize
longwood Fellows with the operations and purposes of all areas of Longwood Gardens
and other botanic gardens.
RESTRICTIONS: May be repeated for up to ten credits.
PLSC 833  SEMINAR: SOIL SCIENCE  1
Current topics in soil science will be discussed from the literature
PLSC 834  CURRENT TOPICS IN AGRONOMY  1
Seminars to review current agronomic literature
PLSC 835  ENVIRONMENTAL SOIL PHYSICS  4
PREREQ: PLSC204 and MATH221
PLSC 864  SEMINAR PLANNING AND DEVELOPMENT 1 PF
Planning, developing and hosting a major seminar series: topic and speaker selection, format and schedule development, marketing, local arrangements and hosting.
PLSC 865  SEMINAR 1
PLSC 868  RESEARCH 1-9
PLSC 869  MASTER’S THESIS 1-6
PLSC 874  TOPICS IN MOLECULAR BIOLOGY  1
Provides a forum for the discussion of current topics in molecular biology, with critical
reading of relevant primary literature.
RESTRICTIONS: Requires permission of instructor
PLSC 964  PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation of dissertation topics and/or qualifying examina-
tions for doctoral students before admission to candidacy but after completion of all
required course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.
PLSC 969  DOCTORAL DISSERTATION 1-12 PF

PORTUGUESE
PORT 105  BRAZILIAN PORTUGUESE I - ELEMENTARY  4
Introduction to Brazilian Portuguese language and development of speaking, listening,
reading and writing skills through the use of basic texts
PORT 106  BRAZILIAN PORTUGUESE II - ELEMENTARY/INTERMEDIATE  4
Completion of basic Brazilian Portuguese. Increasing mastery of the basic skills of speak-
ing, listening, reading and writing
PREREQ: PORT105
RESTRICTIONS: Two or three years of high school Brazilian Portuguese acceptable in lieu
of Prerequisite

POLITICAL SCIENCE
POSC 100  INTRODUCTION TO POLITICAL SCIENCE  3
Introduction to the study of political concepts of the discipline, such as political power, author-
ity, decision making, conflict management, representation and institutions of government
RESTRICTIONS: Requires CHEM418 or CHEM443
POSC 105  THE AMERICAN POLITICAL SYSTEM  3
Constitutional principles, structure and functions of the political process in the United
States
RESTRICTIONS: Cannot be substituted for POSC105
POSC 106  INTRODUCTION TO POLITICAL SCIENCE: ISSUES  3
Selected problems of politics drawn from comparative and international politics, American government and political theory.
POSC 202  INTRODUCTION TO SCIENTIFIC INQUIRY  3
Introduces students to the foundations of scientific social research, with emphasis on polit-
ical phenomena. Prepares students in the skills needed to conduct scientific research.
RESTRICTIONS: Students cannot take both POSC202 and POSC302 for credit
POSC 211  INTRODUCTION TO POLITICS IN DEVELOPING COUNTRIES  3
Forces affecting politics in emerging nations. Impact of colonialism, economic develop-
ment, military rule, instability and environment. Discussion of how developing nations
affect the world political system.
POSC 220  INTRODUCTION TO PUBLIC POLICY  3
Emphasis on what government does, with a focus on substantive policy areas as well as
the mechanisms of policy making. Case studies of policy areas (e.g., health policy, envi-
ronmental policy, social welfare policy, etc.) used to illustrate processes of agenda set-
ing, decision making and policy implementation.
POSC 240  INTRODUCTION TO INTERNATIONAL RELATIONS  3
The development of international systems, their structure and political economic dynamics.
Fundamental analytical concepts and approaches.
POSC 260  HUMANITIES COLLOQUIUM  3
See ARSC260 for course description
POSC 270  COMPARATIVE POLITICS  3
Introduction to comparison of politics "within nations." Covers Europe, Africa, Asia and
Latin America
POSC 285  CURRENTS IN POLITICAL THEORY  3
Basic introduction to political philosophy, organized around particular historical peri-
ods or specific philosophers, but around some of the most important, enduring questions
of political theory: What is the nature of the state? What are the obligations and respon-
sibilities of citizens?
POSC 301  STATE AND LOCAL GOVERNMENT  3
American federalism with emphasis on government and politics, with special attention to
Delaware
POSC 302  RESEARCH METHODS  3
Design, measurement of political phenomena, collection and analysis of data and use of
computer in political research
POSC 303  THE ADMINISTRATIVE PROCESS  3
Public administration treated as process of organization, methods of management and
decision making common to all levels of bureaucracy
POSC 306  ECONOMIC THEORY OF POLITICS  3
See ECON306 for course description.
POSC 310  EUROPEAN GOVERNMENTS  3
Structure and process of British, French, West German and Russian governments
POSC 311  POLITICS OF DEVELOPING NATIONS  3
Forces determining public policy among the emerging nations. Cross-national compara-
tive analysis.
POSC 312  EAST ASIAN POLITICAL SYSTEMS  3
An introductory survey to study the structure and process of political power in major coun-
tries in Asia. Special emphasis on China and Japan
POSC 313  AMERICAN FOREIGN POLICY  3
The theory, policies and administration of U.S. foreign policy
POSC 316  INTERNATIONAL POLITICAL ECONOMY  3
Interaction of international political and economic phenomena. Considers history and
development of political economy, and the political underpinnings and effects of global
monetary, trade, financial and investment systems. Both relations among advanced coun-
tries, and between the advanced and poor countries will be considered
POSC 320  PARTIES AND INTEREST GROUPS  3
Organization and behavior of political parties and interest groups, including structure,
leadership, recruitment and decision making.
POLITICAL SCIENCE

POSC 321 MINORITY GROUP POLITICS 3
Examines the history, strategic positions and political tactics of Blacks, Chicanos (Hispanic Americans), Native Americans and women in the American political system. Where appropriate, the politics of ethnic and racial minorities will be compared/contrasted to the politics of women.

POSC 322 BLACK POLITICS 3
Shows insight and understanding about the Black experience in the American political system. Basic questions addressed are: Is Black politics unique and, therefore, different from American politics? What are the goals and aspirations of Black America and are they universally shared? May be cross-listed with BANS322.

POSC 323 INTRODUCTION TO WOMEN AND POLITICS 3
Intensive preparation for effective participation in the National Model United Nations held in New York City each April. May be repeated once for credit.

POSC 324 POLITICAL BEHAVIOR 3
Public opinion, voting and elections, the mass media, ideology, political socialization and violence. The relationship between public opinion and public policy.

POSC 329 INTERNATIONAL MIGRATION 3
This interdisciplinary course introduces alternative/complementary disciplinary approaches to the study of human movement between states. It is offered on a rotational basis by faculty involved in the University of Delaware migration group. May be cross-listed with GEOG329, HIST329 and/or SOCIS329.

POSC 330 POLITICAL TERRORISM 3
Selectively examines cases, trends and organizations which have made the violence termed terrorism so salient. Also examines whether governments, including the U.S., are responding appropriately to the challenge.

POSC 333 COMMUNISM, FASCISM AND DEMOCRACY 3
Ideology and environmental contexts. Understanding of the operating nature and causes of these aspects of contemporary Western political life.

POSC 334 LIBERALISM AND CONSERVATISM 3
Introduces capitalism, socialism, liberalism, conservatism and democratic forms of Marxism. Examines problems of economic growth, equality, freedom and self-realization, bureaucracy, representation, justice, brotherhood, the profit motive, social cohesion, nationalism and the international order.

POSC 339 BRITAIN AND EUROPE 3
Examines Britain's role in an integrated Europe, with focus on contemporary problems and prospects of closer British ties to the European Union and related bodies.

POSC 340 POLITICS AND THE MEDIA 3
Political roles of the media in socialization, political competence, agenda setting, the electoral process and political crises. Emphasis on media-political system interaction and its import for a democratic society.

POSC 341 ENVIRONMENT OF MULTINATIONAL CORPORATIONS 3
See BUAD341 for course description.

POSC 343 SOCIETY, POLITICS AND HEALTH CARE 3
Interdisciplinary study of the political, social, economic and humanistic issues of health care and health policy. Students will develop the capacity to understand the political process and its relationship to the health care delivery system. May be cross-listed with CSCI343 and/or SOCI343.

POSC 350 POLITICS AND THE ENVIRONMENT 3
The political context of environmental issues: air and water pollution, population control, and conservation.

POSC 355 URBAN POLITICS 3
Decision-making processes and the exercise of political power in urban communities.

POSC 360 HUMANITIES COLLOQUIUM 3
See ASRC360 for course description.

POSC 362 DIPLOMACY 3
Diplomacy is the art of formal representation and policy implementation. Diplomats need to understand complex material and represent positions in an effective manner. These skills are applicable in a variety of contexts. Readings, discussions, cases and simulations are used to introduce diplomatic skills.

POSC 363 INTERNATIONAL LAW AND ORGANIZATION 3
Introduction to the development of international law and international organization.

POSC 365 MODEL UNITED NATIONS 3
Intensive preparation for effective participation in the National Model United Nations held in New York City each April.

RESTRICTIONS: May be repeated once for credit. Open only to selected delegates to the National Model United Nations.

POSC 366 INDEPENDENT STUDY 1-6

POSC 372 EAST CENTRAL EUROPEAN POLITICS 3
Survey of East Central European political systems (Poland, Hungary, Czechia and Slovakia, Germany, Romania, former Yugoslavia, Bulgaria and Albania) after World War II. The so-called new federal states in Germany (ex-DDR) will be emphasized.

POSC 377 ARAB-ISRAELI POLITICS 3
Development of the Arab-Israeli conflict analyzed from the Drayfus Affair and the Balfour Declaration to current events.

POSC 380 INTRODUCTION TO LAW 3
Broad overview of the nature, functions and limits of law. Emphasis on the legal instruments used to regulate, control and promote behavior and deal with social problems. May be cross-listed with LEST380.

POSC 387 AMERICAN POLITICAL THOUGHT 3
Overview of American political thought. Focuses on critical formative periods in American politics, such as the Founding, Civil War and Industrial Revolution, with readings selected from the writings and speeches of key American statesmen.

POSC 390 HONORS COLLOQUIUM 3
See ASRC390 for description.

POSC 400 PRACTICUM IN TEACHING POLITICAL SCIENCE 3
PF
Available to outstanding Senior political science majors interested in obtaining teaching experience at the college level. Provides opportunity to lead discussion sections of students in lower division courses.

RESTRICTIONS: Requires permission of instructor.

POSC 402 CIVIL LIBERTIES I 3
Individual constitutional rights of expression, religion, "fundamental rights" (such as privacy and travel) and equal protection as developed by the U.S. Supreme Court. Role of the Supreme Court in American government.

POSC 404 THE JUDICIAL PROCESS 3
Structure, process and personnel of American courts; factors influencing decisions and judicial policy making.

POSC 405 CONSTITUTIONAL LAW OF THE UNITED STATES 3
Constitutional principles regulating organization and function of federal government. United States Supreme Court decisions placed in a sociopolitical context.

POSC 406 CIVIL LIBERTIES II 3
Constitutional rights of the accused in the U.S. judicial system, especially as developed through Supreme Court cases.

POSC 407 AMERICAN PRESIDENCY 3
Modern American presidency with emphasis on presidential recruitment, organization and staffing. The nature and exercise of presidential power in the decision making process.

POSC 408 INTERNATIONAL ORGANIZATION 3
Analysis of the organization of the international system, its structure, operating principles, formal and informal components.

POSC 409 CONTEMPORARY PROBLEMS OF WORLD POLITICS 3
Critical areas of international politics. Topics vary by instructor.

RESTRICTIONS: May be repeated once when topics vary.

POSC 411 POLITICS AND POVERTY 3
Relationship of policy making and social conditions in the United States with regard to capacity of government to cope with problems arising from over-population and socio-economic differences.

POSC 412 FOREIGN POLICY OF THE POST-SOVIET UNION 3
Principles, foreign policies and administration of the former Soviet government and its most important successor states.

POSC 413 PROBLEMS IN AMERICAN GOVERNMENT 3
Contemporary problems in American government and politics. May be cross-listed with WOMS413.

RESTRICTIONS: May be repeated for credit once when topics vary.

POSC 414 PROBLEMS IN AMERICAN FOREIGN POLICY 3
Contemporary problems in American foreign policy and policy making.

RESTRICTIONS: May be repeated for credit once when topics vary.

POSC 415 FORCE AND WORLD POLITICS 3
Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.

POSC 420 INTRODUCTION TO POLITICAL ECONOMY 3
Recent political and economic history, contemporary economic policy disputes and an analysis of how the Democratic-Republican balance of power affects, and is affected by, changing economic conditions and the results of policies put into effect.
POSC 423 CONGRESS AND PUBLIC POLICY  3
Democratic functions of a modern legislature; legislative structures and processes; coalitions and cleavages; parties, ideological factions and interest groups; the Federal budget, national priorities and Congressional intervention in the economy; central policy issues before Congress; Congressional oversight of the bureaucracy; Congress and the Presidency; and election of the Congress.

POSC 424 ENERGY POLICY AND ADMINISTRATION  3
World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Analyzes progress and design of U.S. science and technology policy in energy domain.

POSC 426 LATIN AMERICAN POLITICAL SYSTEMS  3
Impact of social and economic change on the political processes.

POSC 427 POLITICS IN CHINA  3
An in-depth study of who governs China and the relations among the major forces: the party, the military and the bureaucracy.

POSC 428 POLITICS IN JAPAN  3
An in-depth study of who governs Japan and how these relations have evolved since the end of World War II.

POSC 431 LATIN AMERICAN POLITICS: COUNTRIES  3
Contemporary political events in three Latin American countries. Comparisons of the actions and influence of the military, church, bureaucrats, political parties and guerrilla groups in three different Latin American settings: modern, transitional and traditional.

POSC 432 POLITICAL SYSTEM OF THE POST-SOVET UNION  3
Structure and process of the political system of the USSR and its most important successor states (Russia, Ukraine, Byelarus, Kazakhstan and others).

POSC 433 AFRICAN POLITICS  3
Overview of politics and society in sub-Saharan Africa including: colonialism, the rise of nationalism, decolonization, single-party and military rule, the role of social movements and religions, class, gender and ethnic identities and the move toward economic and political liberalization.

POSC 434 POLITICAL THOUGHT I  3
From Plato to Machiavelli.

POSC 435 POLITICAL THOUGHT II  3
From Machiavelli to present.

POSC 436 POLITICS AND LITERATURE  3
Class, civil rights, feminism, revolution and other political issues examined through novels, films and other literary works. May be crosslisted with WOMS 436.

POSC 437 WHO GOVERNS? PERSPECTIVES ON POLITICAL POWER  3
Raises the question "Who Governs" and attempts to answer it by critically examining various schools of thought about who actually has and who should have political power in capitalist countries.

POSC 439 PROBLEMS IN AFRICAN POLITICS  3
Examination of selected topics in contemporary African politics. Will focus in-depth on aspects of politics and society in a specific region of Africa or will investigate in greater detail issues confronting Africa today such as economic structural adjustment, democratization and state-society relations. May be crosslisted with BAMS 439.

POSC 441 PROBLEMS OF WESTERN EUROPEAN POLITICS BY COUNTRY  3
Intensive examination of European politics from the perspective of a specific country, e.g., France, Spain, England and Greece. RESTRICTIONS: Offered only in conjunction with travel abroad programs. May be repeated for credit when topics vary.

POSC 442 PROBLEMS OF WESTERN EUROPEAN POLITICS  3
Examination of current political trends in Western European politics, including changes in party systems and problems of European integration.

POSC 443 CHINA AND THE WORLD  3
An objective examination of China's relations with the major countries in the world. Special attention paid to China's policy towards the superpowers and its role in the "Third World."

POSC 444 SEMINAR IN WORLD POLITICS  3
Survey of current world problems including seminar sessions with visiting scholars. Content varies from year to year.

POSC 445 HUMAN RIGHTS AND WORLD POLITICS  3
Alternative theories of human rights examined in cross-cultural and international contexts. International documents, contemporary cases (e.g., South Africa) and U.S. foreign policies also examined and evaluated.

POSC 446 INTERNATIONAL HUMAN RIGHTS ON FILM  3
A study of the history, evolution and current status of universal human rights using film as a primary medium. Content covers origins of the international human rights movement during and after WWII. A series of feature films and documentaries also highlights recent and current human rights violations in foreign nations.

POSC 448 THEORIES OF INTERNATIONAL RELATIONS  3
Surveys the theoretical debates regarding how we can conceive of and understand world politics, as well as how we can evaluate contending perspectives. Considers such schools of thought as ancient, idealist, realist, behavioralist, interdependency, radical, neo-realist and poststructuralist perspectives.

POSC 450 PROBLEMS OF LATIN AMERICAN POLITICS  3
Current political issues in selected Latin American countries.

POSC 452 PROBLEMS IN URBAN POLITICS  3
Contemporary problems and political relationships in urban communities.

POSC 453 PUBLIC PERSONNEL ADMINISTRATION  3
Public personnel systems, including political appointees, the general civil service, professional career systems and the collective bargaining system. Emphasis on recruitment, promotion, evaluation, management, patronage, affirmative action and collective bargaining.

POSC 454 PUBLIC ADMINISTRATIVE AND ORGANIZATIONAL THEORY  3
Major administrative and organizational theories as applied to public organizations. Special attention to classical, political and pragmatic theories. Topics include administrative change and decision making.

POSC 455 PUBLIC BUDGETING AND FINANCIAL MANAGEMENT  3
Examines the role of budgeting in government policy formation, resource allocation, communication and control. Reviews the relative strength of various public budget systems. Topics also include a survey of techniques employed in the management of government financial operations.

POSC 456 DISASTER AND POLICIES  3
U.S. emergency management and disaster policy examined through books, articles and video tapes dealing with governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents.

POSC 457 MANAGEMENT AND NONPROFIT ORGANIZATIONS  3
Explores the historical and theoretical context of nonprofit organizations. Discusses how nonprofit organizations are structured and pursued in the pursuit of their mission. Designed to prepare students for a career as an administrator in a nonprofit organization.

POSC 458 COMMUNITY SERVICE FIELDWORK  3
Allows students to earn academic credit for fieldwork experiences in public or private community service agencies. Students will share and analyze experiences in a seminar setting with academic requirements. RESTRICTIONS: May be repeated for credit once when topics vary.

POSC 463 THE UNITED NATIONS AND WORLD AFFAIRS  3
Examines the development, institutional structure, and prospects of the United Nations and the UN system.

POSC 464 FIELDWORK IN POLITICAL SCIENCE  1-6
Internship or fieldwork program under the direction of a faculty member, including preparation of a substantial bibliography and/or major research paper. PREREQ: POSC 105. RESTRICTIONS: Requires permission of instructor.

POSC 465 MODEL OAS  3
Theoretical and practical preparation for participation in the Model Organization of American States conference held in Washington, D.C. each year. Participation as delegate to the week-long simulation. May be crosslisted with EDUC 465. RESTRICTIONS: May be repeated once for credit when topics vary.

POSC 466 INDEPENDENT STUDY  1-6

POSC 468 UNDERGRADUATE RESEARCH  1-6
Research conducted under the direction of or in conjunction with a faculty member. May result in a major research paper or be incorporated into a faculty project.

POSC 470 SENIOR HONORS SEMINAR  3

POSC 604 INTERNATIONAL LAW  3
See MAST 673 for course description.

POSC 605 THEORIES IN LAW AND COURTS  3
Content of this research seminar will vary from year to year. Possible topics may be comparative public law, jurisprudence, constitutionalism. A major research paper is required.

POSC 612 FOREIGN POLICY OF THE POST-SOVET UNION  3
Principles, foreign policies and administration of the former Soviet government and its most important successor states.

POSC 614 JUDICIAL PROCESS  3
Examines the structure, personnel, and process of the American judiciary, including factors that influence judicial decisions and the scope and nature of judicial policy making.

POSC 615 FORCE AND WORLD POLITICS  3
Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.
POLITICAL SCIENCE

POSC 624 Energy Policy and Administration 3
World and U.S. energy policies with emphasis on nuclear power, solar energy and fossil fuels. Analyzes progress and design of U.S. science and technology policy in energy domain. May be crosslisted with MAST620 and/or UAPP623.

POSC 626 Conservation and Renewable Energy Policy 3
See UAPP626 for course description.

POSC 627 Latin American Political Systems 3
Impact of social and economic change on the political processes.

POSC 628 Comparative Environmental Politics 3
See UAPP627 for course description.

POSC 632 Political System of the Post-Soviet Union 3
Structure and process of the political system of the USSR and its most important successor states (Russia, Ukraine, Byelarus, Kazakhstan and others).

POSC 633 African Political Systems 3
Structure, process and policies of the governments of Africa, south and north of the Sahara.

POSC 634 Political Thought I 3
An in-depth study of major political philosophers of the Western tradition from Plato to Machiavelli.

POSC 635 Political Thought II 3
An in-depth study of major political philosophers of the Western tradition from Machiavelli to the present.

POSC 640 International Development Policy and Administration 3
Poverty and inequality in developing countries and the economic development policies employed to alleviate them. Emphasis on policy reform, trade strategies, sustainable development, and the role of the state. The approaches used by the World Bank, the IMF and USAID. May be crosslisted with UAPP640.

POSC 642 Problems of Western European Politics 3
Examination of current political trends in Western European politics, including changes in party systems and problems of European integration.

POSC 650 Problems of Latin American Politics 3
Current political issues in selected Latin American countries.

POSC 652 Topics in Political Theory 3
Focuses on selected topics in political theory, including Marxism, Liberalism and Contemporary Political Theory.

POSC 656 Politics and Disaster 3
The politics and public administration of governmental preparedness for, and response to, natural and human-caused disasters and emergency incidents. May be crosslisted with UAPP656.

POSC 659 Topics in Public Administration 3
See UAPP659 for course description.

POSC 678 Coasal and Maritime Law 3
See MAST678 for course description.

POSC 679 Shipping and Port Management 3
See MAST679 for course description.

POSC 681 Metropolitan Infrastructure and Transportation 3
See UAPP681 for course description.

POSC 683 Regional Policy Analysis 3
See UAPP683 for course description.

POSC 685 Personnel and Human Resource Issues: Current Topics 3
See UAPP685 for course description.

POSC 686 State and Local Government 3
See UAPP686 for course description.

POSC 687 State Government Management and Policy 3
See UAPP687 for course description.

POSC 688 Topics in State and Local Management 3
See UAPP688 for course description.

POSC 800 Seminar: Philosophy of Political Inquiry 3
Introduces basic topics of political inquiry. Surveys philosophies of science, epistemology, and ethics and seeks to address questions such as: What is theory? How are scientific theories of politics constructed and evaluated? What constitutes a valid description or explanation? Conceptual and normative issues are also explored.

POSC 801 Research Design for Political and Policy Sciences 3
Seminar helps students understand and evaluate alternative research strategies. Each participant has an opportunity to write a research proposal that is then critiqued by members of the class and the instructor. A wide variety of research designs is covered.

POSC 803 Seminar: Public Administration 3
Reading and discussion of theories and problems of public administration, including organization, coordination, field administration, contracts, personnel, policy making, participation, adjudication, budgeting, and administrative behavior. May be crosslisted with UAPP803.

POSC 805 Seminar: Public Law 3
Core seminar for the field of law and courts. Provides a broad overview of the range, depth and variety of approaches in current research within this field.

POSC 808 American Political Institutions 3
Explores major themes, viewpoints, issues and topics pertaining to the American political system. Themes include stability, change, conflict, American exceptionalism, American political thought, alternative perspectives on democracy, analysis of political parties, interest groups, Congress, the presidency and the courts.

POSC 810 Seminar: Comparative Government 3
Focuses on the evolution of the politics within national states, the principal theoretical approaches in studying politics cross-nationally and major scholarly controversies. Students review a broad spectrum of comparative research and writing.

POSC 811 Topics in Comparative Government 3
Focuses on selected topics in Comparative Government and Politics.

POSC 813 Seminar: American Foreign Policy 3
Overview of contemporary American foreign policy and policy making, as well as the analytical, conceptual and methodological problems associated with foreign policy analysis.

POSC 814 Political Economy of the Environment 3
See UAPP810 for course description.

POSC 815 Public Management Statistics 3
See UAPP815 for course description.

POSC 816 Advanced Social Statistics 3
Provides advanced training in applied social statistics. Topics include analysis of variance, regression analysis, analysis of covariance, multi-dimensional cross-classifications and future analysis. Lectures supplemented by laboratory work involving computer statistical packages and simulations. May be crosslisted with UAPP816.

POSC 817 Financing Alternatives in the Public Sector 3
See UAPP817 for course description.

POSC 818 Environmental Policy and Administration 3
U.S. environmental policy and administration of air and water pollution control programs. Secondary consideration given to population control, energy and natural resource development and conservation, as well as intergovernmental relations in environmental program implementation. May be crosslisted with MAST871 and/or UAPP818.

POSC 819 Management Decision Making 3
See UAPP819 for course description.

POSC 821 Proseminar: Technology, Environment and Society 3
See UAPP821 for course description.

POSC 825 Comparative Public Administration 3
A reading and discussion seminar concentrating on the development of administration and bureaucratic elites in developed and developing countries. Attention given to French, British and German bureaucracies and the problems of ethics, decentralization, planning, political influences and external controls. May be crosslisted with UAPP825.

POSC 829 Advanced Public Finance 3
See UAPP829 for course description.

POSC 830 Seminar: International Relations 3
Surveys broad range of international relations theory including realism, neo-realism, interdependence, unilevel analysis, regime theory, world system theories, post-structuralism, feminism and normative theory. Epistemological and conceptual problems associated with international relations research are explored.

POSC 833 Seminar: Normative Political Theory 3
Department's core seminar in political philosophy which attempts to acquaint the student with the major figures in political thought from ‘Plato to the present.’ Within that framework there is normally emphasis placed on the thought of one or two individuals.

POSC 835 Organizational Theory and Administration 3
Examines the major theories of organization and considers their implications for strategies of administrative. Focuses on selected aspects of organizational psychology and administrative behavior related to motivation and incentives, group dynamics and leadership and control. May be crosslisted with UAPP835.
PSYC 201 **GENERAL PSYCHOLOGY** 3
A foundation course in the application of the scientific method to problems of human behavior and experience.

PSYC 270 **FAMILIES AND DEVELOPMENT DISABILITIES** 3
See IFST 270 for course description.

PSYC 301 **PERSONALITY** 3
A survey of data and theories of human personality and affect
PREREQ: PSYC 201.

PSYC 303 **INTRODUCTION TO SOCIAL PSYCHOLOGY** 3
Analysis of interpersonal behavior with special emphasis on problems of conformity and influence, the organization and dynamics of social groups; and the development of opinions and attitudes.
PREREQ: PSYC 201.

PSYC 304 **EDUCATIONAL PSYCHOLOGY: SOCIAL ASPECTS** 3
See EDUC 304 for course description.

PSYC 305 **EDUCATIONAL PSYCHOLOGY: COGNITIVE ASPECTS** 3
See EDUC 305 for course description.

PSYC 309 **MEASUREMENT AND STATISTICS** 3
Theory and the application of statistical techniques to psychology data
PREREQ: One course in basic college mathematics and PSYC 201.

PSYC 310 **SENSATION AND PERCEPTION** 3
Theories and experimental study of sensation and perception.
PREREQ: PSYC 201 and PSYC 309.

PSYC 312 **LEARNING AND MOTIVATION** 3
Experimental study of contemporary theories of learning and motivation.
PREREQ: PSYC 201 and PSYC 309.

PSYC 314 **BRAIN AND BEHAVIOR** 3
Study of the brain mechanisms underlying hunger, sex, aggression, learning, memory, perception, sleep and waking. May be cross-listed with CGSC 314.
PREREQ: PSYC 201.

PSYC 317 **SEXUAL BEHAVIOR AND MOTIVE** 3
An objective view of sex from physiological, psychological, sociological, and anthropological studies. Readings include Masters and Johnson, Freud, Kinsey, Reiss, and Ford and Beach. Practical sexual information, e.g., contraception, also discussed, sometimes by outside experts.
PREREQ: PSYC 201 and PSYC 309.

PSYC 324 **INDUSTRIAL PSYCHOLOGY** 3
Psychological factors in selection, training, fatigue, morale, attitudes, accidents, and other aspects of worker efficiency
PREREQ: PSYC 201 and PSYC 309.

PSYC 325 **CHILD PSYCHOLOGY** 3
Survey of the interactions of physiological, psychological, and environmental factors determining psychological development. Consideration of major theories of child development
PREREQ: PSYC 201.

PSYC 333 **PSYCHOLOGY OF WOMEN** 3
Psychological analysis of the meaning and implications of being a woman; and cause and consequences of the female experience. Biological sex vs. psychological sex-role identity, stereotyping, discrimination, self-concept, and the feminist perspective. May be cross-listed with WOMS 333.
PREREQ: PSYC 201 or any 300-level psychology course.

PSYC 334 **ABNORMAL PSYCHOLOGY** 3
Disorders of behavior and consciousness including the various psychoses, psychoneuroses, mental deficiency, and other conditions
PREREQ: PSYC 201.

PSYC 340 **COGNITION** 3
Survey of major themes in human thought processes, concept formation, problem solving, creativity, language use and cognitive development. May be cross-listed with CGSC 340.
PREREQ: PSYC 201 and PSYC 309.

PSYC 346 **PSYCHOLOGY AND THE LAW** 3
See CRU 346 for course description.

PSYC 350 **DEVELOPMENTAL PSYCHOLOGY** 3
An analysis of theory and research in developmental psychology including the topics of developmental processes, developmental risk, systems theory and contemporary social issues
PREREQ: PSYC 201 and PSYC 309.
RESTRICTIONS: If both PSYC 325 and PSYC 350 are taken, only PSYC 350 will count for major credit. Psychology majors and minors only.

PSYC 365 **PSYCHOLOGY FIELD PLACEMENT** 3
Student contracts with any psychology instructor. Requirements include a minimum of four hours per week working in an agency, institution or business, reading assignments and writing a term paper. Placement will be made with assistance from Career Planning and Placement. Inquiries should be made several months in advance.
PREREQ: PSYC 201 and PSYC 309.

PSYC 366 **INDEPENDENT STUDY** 1-6
Major credit Psychology majors and minors only.

PSYC 370 **RESEARCH IN PERSONALITY** 3
An analysis of contemporary issues and research in personality including the assessment of personality traits, the personality situation interaction and the social and biological bases of individual differences.
PREREQ: PSYC 201 and PSYC 309.
RESTRICTIONS: If both PSYC 301 and PSYC 370 are taken, only PSYC 301 will count for major credit. Open to Psychology majors and minors only.

PSYC 380 **PSYCHOPATHOLOGY** 3
Exploration of research on diagnosis, etiology and treatment of major pathological disorders. Emphasis on original research articles, class discussion, assessment instruments in addition to analysis of video taped interviews with patients used to illustrate the disorders.
PREREQ: PSYC 201 and PSYC 309.
RESTRICTIONS: If both PSYC 334 and PSYC 380 are taken, only PSYC 334 will count for major credit. Open to Psychology majors and minors only.

PSYC 390 **SOCIAL PSYCHOLOGY** 3
An analysis of theory and research in social psychology including the topics of social cognition, attitudes, interpersonal, group and intergroup relations. Student designed research projects including data analysis.
PREREQ: PSYC 201 and PSYC 309.
RESTRICTIONS: If both PSYC 303 and PSYC 390 are taken, only PSYC 303 will count for major credit. Open to Psychology majors and minors only.

PSYC 403 **PSYCHOLOGY OF NONVERBAL BEHAVIOR** 3
A seminar on the social psychological implications of the research literature on nonverbal behavior in social interaction. Focuses on interpersonal attraction, leadership, impression formation, sexual attraction, deception, social attitudes and cross-cultural factors, with practical applications.
PREREQ: PSYC 309 and PSYC 303 or PSYC 390.

PSYC 406 **REDUCTION OF INTERGROUP CONFLICT** 3
The reduction of intergroup conflict in business, educational and experimental laboratory settings, with special attention given to organizational mergers. Investigation of strategies for reducing intergroup conflict.
PREREQ: PSYC 309 and PSYC 303 or PSYC 390.
PSYC 410 Biological Bases of Motivation and Emotion 3
An evolutionary approach towards three major theories of motivation-ethologists' instinct theory, Freud's psychoanalytic theory, and psychologists' drive theory. Covers current work on circadian rhythms, obesity and anorexia, sleep, fever, phobias, learned helplessness, voodoo death, fear, love and aggression.
PREREQ: PSYC301 and PSYC309

PSYC 411 Brain and Computer 3
The computing machinery of the brain: a hands-on introduction to neural models and networks. May be cross-listed with CGSC411.
PREREQ: PSYC310 or PSYC312 or PSYC314 or PSYC340

PSYC 414 Drugs and the Brain 3
Topics covered include drug treatment of mental illness, and drug abuse/addiction.
PREREQ: PSYC309; PSYC314
RESTRICTIONS: PSYC338 or PSYC334 recommended in addition to Prerequisites.

PSYC 415 History and Systems of Psychology 3
Psychology from the early Greeks through the more important "schools" of the 20th century.
PREREQ: Two of the following: PSYC310, PSYC312, PSYC314 or PSYC340 as well as one of: PSYC350, PSYC370, PSYC380 or PSYC390.

PSYC 416 Psychological Perspectives on the Black American 3
The experience of Black Americans as viewed from a psychological perspective. Psychological theory and research pertaining to black Americans; reactions to oppression, collective behavior, personality development, and life styles. May be cross-listed with BAMS432.
PREREQ: PSYC309; and PSYC390 or PSYC303.

PSYC 417 Animal Behavior 3
Seminar on naturalistic and experimental investigations of species-typical behavior.
PREREQ: PSYC309.

PSYC 418 Human Emotions 3
Emotions, cognition and behavior. Role of emotions in personality and social relationships. Includes laboratory/tutorial session with analysis and presentation of scenes from dramatic literature to illustrate integration of emotion, cognition and action.
PREREQ: PSYC309; and PSYC301 or PSYC370 or PSYC325 or PSYC350.

PSYC 424 Applied Social Psychology 3
The application of basic principles of interpersonal behavior to everyday life. Topics covered include persuasion, reciprocation, employee motivation, organizational development, liking and authority.
PREREQ: PSYC309, and PSYC303 or PSYC390.

PSYC 425 Family Conflict and the Child 3
Analysis of specific topic areas in child psychology, such as infancy and cognitive and social development. Topics may vary from year to year.
PREREQ: PSYC325 or PSYC350.

PSYC 441 Computers and Cognition 3
Introduction to computer models of cognitive processes. Computer models gave rise to the interdisciplinary area of cognitive science. Course covers basic types of models that have been used and a discussion of their psychological plausibility. May be cross-listed with CGSC441.
PREREQ: PSYC340.

PSYC 443 Topics in Organizational Communication 3
See COMM442 for course description.

PSYC 444 The Psychology of Aesthetics 3
Psychological and psychobiological theories and empirical investigations of aesthetic experience.
PREREQ: PSYC309, PSYC310, or PSYC314.

PSYC 445 Topics in Adolescent Psychology 3
Analysis of the physiological, psychological and social factors influencing psychological development from late childhood through adolescence.
PREREQ: PSYC309, and PSYC325 or PSYC350.

PSYC 460 Assessment of Young Children 3
See FST452 for course description.

PSYC 462 Language Acquisition 4
See EDUC462 for course description.

PSYC 466 Independent Study 1-6

PSYC 468 Research 3-6

PSYC 481 Clinical Psychology 3
Introduction to clinical theories, research and practices. Diagnosis, classification and treatment of behavior disorders.
PREREQ: PSYC309, and PSYC334 or PSYC380.
RESTRICTIONS: Psychology majors only.

PSYC 482 Controversies in Abnormal Psychology as Portrayed in Movies 3
Uses movies to illustrate certain types of psychiatric diagnoses and a text presenting journal articles representing pro and con views about controversies concerning these disorders. Students discuss the disorders and controversies using the fictionalized characters and events as illustrations.
PREREQ: PSYC380 or PSYC334.
RESTRICTIONS: Course limited to Psychology majors or minors, Juniors or Seniors.

PSYC 490 Social Interdependence 3
Presents theoretical and empirical approaches of social psychology to the study of conflict versus cooperation between mutually dependent people. Cooperation/conflict is analyzed in terms of the effects of environmental feedback to the reward structure of the relationship, and the interpersonal values of participants.
PREREQ: PSYC309
RESTRICTIONS: Junior and Senior Psychology Majors.

PSYC 491 Psychology of Temporal Orientation 3
The psychology of temporality is the scientific study of how temporal frames of reference regarding the past, present and future affect a variety of basic human processes. The purpose of this course is to learn more about these concepts and in the process, learn something about human behavior.
PREREQ: PSYC309 and PSYC303 or PSYC390 or PSYC310.
RESTRICTIONS: Psychology majors only.

PSYC 606 Animal Behavior 3
Seminar on naturalistic and experimental investigations of species-typical behavior.

PSYC 612 Human Psychophysiology 3
Introduction to psychophysiological recording techniques. Elementary anatomy and physiology of the human nervous system. Application of psychophysiological techniques to the investigation of psychopathology, information processing and social psychology. Laboratory demonstration of polygraphic measurement of autonomic and CNS variables with small computer analysis.
PREREQ: PSYC399.
RESTRICTIONS: Requires permission of instructor.

PSYC 616 Computer Models of Cognition 3
Survey of computer models for perception, language and problem-solving. Covers representation schemes and control structures used in artificial intelligence models. Emphasis placed on their psychological relevance. May be cross-listed with CGSC616.
RESTRICTIONS: Requires permission of instructor.

PSYC 624 Industrial Social Psychology 3
Social psychology applied to problems of productivity, satisfaction, communication and organization.
PREREQ: PSYC303.

PSYC 626 Neuroscience I 4
See BISC626 for course description.

PSYC 627 Neuroscience II 3
See BISC627 for course description.

PSYC 630 Neurons and Networks 3
Introduction to computational neuroscience: computer models of artificial neurons and networks and the modelling of brain function. Covers theoretical background and involves hands-on projects to explore processing of sensory information, pattern discrimination, learning, memory and the generation of movement. May be cross-listed with CGSC630.
RESTRICTIONS: Requires permission of instructor.

PSYC 642 Mental Representation and Memory 3
Human memory can be conceptualized in terms of representation and information storage within various interconnected mental systems. Critically evaluates research on human memory and representation within the context of major cognitive models. May be cross-listed with CGSC442.
RESTRICTIONS: Requires permission of instructor.

PSYC 668 Research 1-6

PSYC 675 Language Acquisition 4
See EDUC675 for course description.

PSYC 692 Social Skills Training for Children 3
See EDUC92 for course description.

PSYC 804 Seminar: Human Development 3
Selected research literature in developmental psychology. May be cross-listed with EDUC357.
RESTRICTIONS: Requires permission of instructor.

PSYC 807 Group and Interpersonal Processes 3
Addresses basic theoretical and empirical knowledge of group processes, structures and interactions.
RESTRICTIONS: Requires permission of instructor.
PSYC 809 RESEARCH DESIGN 3
An overview of methodological issues in the conduct of psychological research, including
statistical, experimental, and quasi-experimental studies. Special emphasis on critical
and personality research.

PSYC 813 SEMINAR IN INTERGROUP RELATIONS 3
Cognitive, motivational and cultural factors involved in the creation of and reduction of
intergroup bias and conflict. Emphasis on theoretical and applied perspectives.
RESTRICTIONS: Requires permission of instructor.

PSYC 817 INDIVIDUAL INTELLIGENCE TESTING 3
See EDUC817 for course description.

PSYC 819 PSYCHOTHERAPY I 3
Survey of theories, schools, and techniques of psychotherapy and critical review of rele-
vant research.

PSYC 820 PSYCHODIAGNOSTICS: OBJECTIVE TRAIT AND BEHAVIORAL
ASSESSMENT 3
Theory and techniques of psychological classification, structured personality assessment,
and behavioral assessment. Administration, scoring and interpretation of the MMPI and
other self-report inventories. Behavior observation in clinical settings. Clinical vs. statisti-
cal prediction.

PSYC 823 LEARNING AND DEVELOPMENT 3
See EDUC823 for course description.

PSYC 824 COMMUNITY MENTAL HEALTH 3
The community's role in contributing to mental illness and the mode and feasibility of orga-
nizing community mental health agencies into a concerted preventive mental hygiene
strategy. Focuses on the Greater Wilmington community.

PSYC 827 ADVANCED PSYCHOTHERAPY II 3
Schools, theories and techniques of psychotherapy including research on psychotherapy
and review of evaluative studies. Supervised practice.
PREREQ: PSYC819

PSYC 829 ADVANCED PSYCHOPATHOLOGY 3
Neurosis and etiology of the behavior disorders of non-organic origin. Theories of psy-
chotherapy, including various modes of conceptualizing psychopathology, i.e., medi-
cal vs. behavioral and psychosocial models. Reliability and validity of psychodiagnosis;
and relevant research and problems of experimental clinical research with institutional-
ized populations.

PSYC 834 SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY I 1-3 PF
Limited diagnostic and therapeutic practice in clinical setting under professional supervision.

PSYC 835 SUPERVISED PRACTICE IN CLINICAL
PSYCHOLOGY II 1-3 PF
Continuation of PSYC834.

PSYC 836 SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY III 1-3 PF
Continuation of PSYC834 and PSYC835.
PREREQ: PSYC834 and PSYC835

PSYC 837 SUPERVISED PRACTICE IN CLINICAL PSYCHOLOGY IV 1-3 PF
Continuation of PSYC834, PSYC835 and PSYC836.
PREREQ: PSYC836

PSYC 845 CHILDHOOD PSYCHOPATHOLOGY 3
See EDUC813 for course description.

PSYC 860 PSYCHOLOGICAL STATISTICS 3
Applications to behavior measurement of probability, regression, analysis of variance and
covariance; psychometrics and scaling techniques; and design of experiments.
PREREQ: STAT201 or PSYC309, and four courses in psychology.

PSYC 861 PSYCHOLOGICAL STATISTICS 3
Applications to behavior measurement of probability, regression, analysis of variance and
covariance; psychometrics and scaling techniques; and design of experiments.
PREREQ: STAT201 or PSYC309, and four courses in psychology.

PSYC 868 RESEARCH 1-6

PSYC 869 MASTER'S THESIS 1-6
RESTRICTIONS: Requires department permission.

PSYC 964 PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation of dissertation and/or qualifying examinations for
doctoral students before admission to candidacy but after completion of all required
course work.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

PSYC 969 DOCTORAL DISSERTATION 1-12 PF

RUSS 105 RUSSIAN I - ELEMENTARY 4
Introduction to the Russian language and development of speaking, listening, reading and
writing skills through the use of basic texts.

RUSS 106 RUSSIAN II - ELEMENTARY/INTERMEDIATE 4
Completion of basic Russian. Increasing mastery of the basic skills of speaking, listening,
reading and writing.
PREREQ: RUSS105
RESTRICTIONS: Two to three years of high school Russian acceptable in lieu of
Prerequisite.

RUSS 107 RUSSIAN III - INTERMEDIATE 4
Review of grammar, continued practice in speaking and writing, and reading texts of
average difficulty.
PREREQ: RUSS106
RESTRICTIONS: Four years of high school Russian acceptable in lieu of Prerequisite. Satisfies
the Arts and Science foreign language requirement.

RUSS 200 RUSSIAN GRAMMAR REVIEW 3
Systematic review of elementary and intermediate Russian grammar, study of complex
sentences, structure and idioms. Some conversational practice.
PREREQ: RUSS107

RUSS 205 RUSSIAN CONVERSATION 3
Practical use of the language. Emphasis on topics drawn from contemporary Russian life
and literature.
PREREQ: RUSS107

RUSS 211 RUSSIAN READING AND COMPOSITION: SHORT FICTION 3
Reading and discussion of 20th-century Russian short stories and novellas. Several short
compositions. Grammar review where appropriate.
PREREQ: RUSS107

RUSS 305 RUSSIAN CONVERSATION AND COMPOSITION 3
Discussion of current cultural, social and political topics in Russia and the former republics.
Vocabulary building, grammar exercises and frequent compositions.
PREREQ: Any 200-level course conducted in Russian

RUSS 310 INTRODUCTION TO RUSSIAN LITERATURE I 3
Masterpieces of poetry, narrative prose and drama from the 19th century.
PREREQ: RUSS211

RUSS 312 INTRODUCTION TO RUSSIAN LITERATURE II 3
Masterpieces of poetry, narrative prose and drama from the 20th century.
PREREQ: RUSS211

RUSS 325 RUSSIAN CIVILIZATION AND CULTURE 3
Survey of the major cultural, social and political developments in Russia from its inception
to the present.
PREREQ: RUSS211

RUSS 366 INDEPENDENT STUDY 1-3

RUSS 401 ADVANCED RUSSIAN GRAMMAR AND COMPOSITION 3
Selected topics in advanced Russian grammar, with special attention to participial con-
structions, verbs of motion, aspect and problems of syntax and word order. Exercises in
writing correct and idiomatic Russian.
PREREQ: One 300-level Russian course

RUSS 440 SPECIAL TOPICS: RUSSIAN DRAMA, PROSE OR POETRY 3
Explores one of the three major genres by examining a specific theme. Subject matter
varies and will be announced in registration booklet.
PREREQ: Any two 300-level Russian courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 455 SELECTED AUTHORS, WORKS AND THEMES 3
Works of one or more outstanding authors or on a special theme.
PREREQ: Two 300-level Russian literature courses.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 465 SEMINAR 3
Various authors and themes.
PREREQ: One 400-level Russian literature course.
RESTRICTIONS: May be repeated for credit when topics vary.

RUSS 466 INDEPENDENT STUDY 1-3

RUSS 665 SEMINAR 3
Various authors and themes.
RESTRICTIONS: May be repeated for credit when topics vary.
SOCI 201 INTRODUCTION TO SOCIOLOGY 3
An overview of the sociological perspective of the study of society, social organization and social institutions with special emphasis on the social causes and consequences of human behavior.

SOCI 202 SOCIAL DEVIANC 3
Describing deviance, research on deviance and explaining deviance.

SOCI 203 INDIVIDUAL AND SOCIETY 3
Analysis of the social formation of the individual. Particular emphasis on socialization and personality development. The contribution of individual patterns of behavior to the functioning of social systems.

SOCI 204 URBAN COMMUNITIES 3
Urbanization, rural-urban social differences and the organization of urban communities by race, class, ethnicity and stage in the life cycle. May be cross-listed with BAMS204.

SOCI 206 WOMEN AND WORK 3
See WOMS206 for course description.

SOCI 208 WORK IN A GLOBAL ECONOMY 3
The role of work in contemporary society. Social, institutional and cultural influences on work. Special emphasis on problem areas such as job satisfaction, professionalism, career patterns, leisure and occupational choice.

SOCI 209 SOCIAL PROBLEMS 3
Topics may include poverty, intergroup conflicts, war, mental illness, aging, adolescence and environmental pollution.

SOCI 210 POPULATION PROBLEMS 3
The interaction between population characteristics and other social and economic factors.

SOCI 211 MEN, CONFLICT AND SOCIAL CHANGE 3
See WOMS211 for course description.

SOCI 213 MEN AND WOMEN IN AMERICAN SOCIETY 3
Designed to provide students with a sociological framework for analyzing sex and gender relations in contemporary American society. Topics include the social construction of gender, patterns of sex-role socialization, gender stratification in the paid work force, gender relations in the family and other social institutions. May be cross-listed with WOMS213.

SOCI 270 FAMILIES AND DEVELOPMENTAL DISABILITIES 3
See IFST270 for course description.

SOCI 301 INTRODUCTION TO SOCIOLoGICAL RESEARCH 4
Survey of research methods and data analysis employed in sociology. PREREQ: SOCI201, and either MATH114 or MATH115.

RESTRICTIONS: Strongly recommended - Junior status and 12 social science credits.

SOCI 303 JUVENILE DELINQUENCY 3
Historical definition of delinquency, abuse and neglect, research in delinquency, causes and treatment of delinquents. May be cross-listed with CRJU303.

PREREQ: SOCI201 or SOCI209.

SOCI 304 CRIMINOLOGY 3
The nature, kinds and causes of crime. Criminal liability, criminal careers and organized racketeering. May be cross-listed with CRJU304.

PREREQ: SOCI201 or SOCI202 or SOCI209.

SOCI 305 SOCIAL CLASS AND INEQUALITY 3
Internal differentiation as a basis for inequality and differential life chances of human societies.

SOCI 306 PERSONALITY AND SOCIETY 3
Interaction of personality and society, including such segments as complex organizations and small groups. Particular emphasis on the social formation of personality, and its role in the production of various modes of social behavior and the dynamics of social change.

PREREQ: SOCI201, SOCI203 or PSYC201.

SOCI 308 THE FAMILY 3
The comparative study of the family in various societies provides a background for the analysis of family organization in modern America.

PREREQ: SOCI201 or SOCI202 or SOCI203 or SOCI209.

SOCI 310 SOCIOLOGY OF HEALTH CARE 3
Professionalization of health occupations, hospitals as social systems, medical education and practice organizations, health care organizations and their interrelationships (politics), and health service patterns. May be cross-listed with CSSC310.

PREREQ: SOCI201.

SOCI 311 HOSPITALS 3
Hospitals, nursing homes and other medically organized inpatient facilities viewed as health care settings and as organizations in society. Includes considerations of hospitals as organizations, as research settings, as locations where health professionals work and as sites of patient experience. May be cross-listed with CSSC311.

SOCI 312 THEORIES OF SOCIETY 3
Covers writings of Karl Marx, Emile Durkheim, Max Weber and related current approaches. Focuses on theoretical perspectives concerned with social development, social conflict, solidarity, social class and gender.

PREREQ: SOCI201.

SOCI 320 PERSONALITY AND POLITICS 3
The role of personality in political behavior. Considerations include the social and psychological motivations for political activity and the differential relationship of personality to variations in political systems, roles, ideologies and dynamics, such as political consensus and cleavage. Attention given to particular methods of research in this specific area of social behavior.

PREREQ: SOCI201 or SOCI203 or PSYC201 or PSYC105.

SOCI 322 CROWDS, CULTS AND REVOLUTIONS 3
Analysis of forms of behavior in relatively unstructured situations such as crowds, panics, riots and demonstrations; and processes of interaction: susceptibility, contagion, polarization and communication.

PREREQ: SOCI201.

SOCI 327 SOCIOLOGY OF ORGANIZATIONS 3
Business enterprises, the military, governmental agencies and other large-scale organizations. Bureaucratic structure, internal systems of status and authority, division of labor, social control, and the individual in the organization.

PREREQ: SOCI201.

SOCI 329 INTERNATIONAL MIGRATION 3
See POSC329 for course description.

SOCI 330 POPULATION, LAW AND SOCIETY 3
Interrelationships among population, law and social structure with an emphasis on analyzing strategies of adaptation to change. Introduction to demographic techniques, contemporary issues such as family planning, population policies, migration, marriage and divorce.

May be cross-listed with CRJU330.

SOCI 336 THE DETECTIVE IN FILM AND FICTION 3
See CRJU336 for course description.

SOCI 341 WELFARE AND SOCIETY 3
Institutional apparatus created to deal with the welfare problems of an industrial society, development of welfare institutions, their structure and functioning.

PREREQ: 18 credit hours in sociology, psychology, political science or economics.

SOCI 343 SOCIETY, POLITICS AND HEALTH CARE 3
See POSC343 for course description.
SOCIOLOGY

SOCI 345 Sociology of Law 3
Analysis of law as a social process in both historical and comparative perspective. Focuses on various theories of law and society and relevant empirical research. May be cross-listed with CRJU435.

SOCI 346 Sociology of Aging 3
Empirical and theoretical investigation of the aging process.
PREREQ: SOCI201 or SOCI202 or SOCI203 or PSYC201

SOCI 347 Theories of Social Work Practice 3
Methods of social work practice: casework, group work, community organization; sociological and psychological foundations underlying social services. May be cross-listed with CRJU414.
PREREQ: SOCI201

SOCI 355 Computers, Ethics and Society 3
See CSCC355 for course description.

SOCI 360 Sociology of Religion 3
Sociological analysis of major religions and the societies with which they have been associated; social settings of particular systems of belief; the relation of status; religious affiliation and personal behavior in modern societies.
PREREQ: SOCI201

SOCI 361 Race, Power and Social Conflict 3
The structure of minority groups; processes of conflict, competition and cooperation; analysis of stratification patterns as they affect and are affected by minority groups. May be cross-listed with CRJU401.
PREREQ: SOCI201

SOCI 366 Independent Study 1-3

SOCI 368 Independent Research 1-6
Independent research under the supervision of a faculty member. Requirements include preparation of a research report consistent with the professional literature in the field. Student and faculty member will file a learning contract describing the research and a report with the department chair.
RESTRICTIONS: Requires permission of instructor

SOCI 380 Development and Modernization 3
Contemporary issues of social, political and economic change in developing societies; Dominant theories of modernization and development; Roles of men and women in developing societies.

SOCI 399 Practicum: Teaching Sociology 3 PF
Practical experience in undergraduate education is gained by serving as a discussion leader in a course taught by a regular member of the faculty.
RESTRICTIONS: Requires permission of instructor. Not for major credit

SOCI 401 Advanced Sociological Methods 3
Conceptualization, design, data collection and data analysis in sociological research. May be cross-listed with CRJU401.

SOCI 402 Urban Studies Practicum and Seminar 4 PF
Field experience and related seminar. Placement in urban planning and service agencies where students work for approximately 160 hours under professionally trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI204

SOCI 407 Sociology of Sex and Gender 3
Seminar on sex and gender relations from a sociological perspective. Surveys current research on gender stratification in the paid work force, the feminization of poverty, gender relations in the family, sexual violence, and feminism as a social movement. Special attention given to current theoretical debates on the origins and persistence of sexual inequality and the interaction of gender with race and class in patterns of social stratification. May be cross-listed with WAMS407.
PREREQ: SOCI201, and either SOCI213 or WAMS201
RESTRICTIONS: Restricted to junior and senior sociology and women's studies majors

SOCI 410 Health Services Practicum and Seminar 4 PF
Field experience and related seminar. Placement in health service settings where student works for about 160 hours under supervision of health service administrators. Students meet in a weekly seminar with coordinator.
RESTRICTIONS: Requires permission of instructor

SOCI 411 Techniques of Demographic Analysis 3
Study of demographic equation (fertility, mortality and migration), population processes (composition and distribution) and the use of computers to analyze demographic data. May be cross-listed with CRJU411.
PREREQ: SOCI301

SOCI 412 Research Practicum 4 PF
Field experience and related seminar. Placement in research, planning and service agencies where students work for approximately 160 hours under professionally trained supervisors. Students meet in a weekly seminar with coordinator.
PREREQ: SOCI301
RESTRICTIONS: Requires permission of instructor.

SOCI 414 Data Analysis 3
Methods of analyzing data in sociological research focusing on multivariate approaches. May be cross-listed with CRJU414.
PREREQ: SOCI301
RESTRICTIONS: Requires permission of instructor.

SOCI 415 Race, Class and Gender 3
Analysis of current American social issues that show interrelationship of race, class and gender. Readings from sociology, Afro-American studies, feminist studies, history and literature. May be cross-listed with BAMS415 and/or WAMS415.

SOCI 416 Social Thought and Contemporary Society 3
Seminar focuses on ways in which sociological theories and methods can be applied to contemporary social problems. Explores how alternative theories and methods serve to create knowledge about contemporary concerns with everyday life, democracy, equality, social structure and power.
PREREQ: SOCI312

SOCI 428 Corporate Crime 3
Nature and causes of the deviant behaviors and crimes of large organizations. How organizations act, are accused of deceiving and defend themselves in cases such as pricefixing, sale of unsafe drugs and illegal spying. May be cross-listed with CRJU428.

SOCI 430 Comparative Sociology 3
Explores sociological similarities and differences between the United States and a selected country on a number of critical sociological topics. Topics include ethnic and religious diversity, culture, demographic structure, social institutions, social stratification and urbanization.
RESTRICTIONS: Requires permission of instructor. Only 3 credits from this course may apply toward departmental requirement of six 400-level credits.

SOCI 435 Sociology of American Jewry 3
Examines the demographic, socioeconomic, cultural, and institutional dimensions of the US Jewish population in the context of models of social integration and in comparison to other immigrant groups in the population. These dimensions are used to discuss current issues facing this population sub-group. May be cross-listed with JWS435.
PREREQ: SOCI201

SOCI 441 Social Welfare Practicum and Seminar 4 PF
Field experience and related seminar. Placement in social service agencies where students work for approximately 160 hours under professionally trained supervisors; students meet in a weekly seminar with coordinator.
PREREQ: SOCI301
RESTRICTIONS: Requires permission of instructor.

SOCI 442 Law and Society Practicum and Seminar 4 PF
Field experience and related seminar. Placement in court, law firm or other law-related institution where students work for approximately 160 hours under professionally trained supervisors; weekly seminar with program coordinator.
PREREQ: SOCI301
RESTRICTIONS: Requires permission of instructor.

SOCI 448 Community-Based Treatment 3
Explores issues related to the appropriateness and design of community-based programs for the mentally disabled, substance abusers, the homeless, dependent children, etc. Emphasis on analyzing client needs and community resources, and on understanding the perspectives of clients, staff and neighbors about these programs. May be cross-listed with CRJU448.

SOCI 450 Political Sociology 3
Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behaviors.
PREREQ: SOCI201

SOCI 454 Lawyer's Ethics 3
An exploration of the ethical, moral and legal dilemmas that confront attorneys in the practice of law and how they attempt to resolve them. May be cross-listed with CRJU454.
PREREQ: SOCI201 and three additional sociology courses.
RESTRICTIONS: Open to Junior and Senior sociology majors only.

SOCI 456 Lawyers and Society 3
Seminar focusing upon the social organization and dynamics of the legal profession. Topics include professional association, law school socialization, professional ethics and law practice. May be cross-listed with CRJU456.
PREREQ: SOCI201 and three additional sociology courses.

SOCI 460 Women in International Development 3
Understanding of international development process in third world countries by examination of the roles of men and women. Analysis of processes of development with emphasis on women's participation and/or exclusion. Examines development at the project proposal or program implementation level. Hands-on experience in practical project development and proposal presentation skills. May be cross-listed with GEOG460, PST460 and/or WAMS460.

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SOCI 464 Internship 1-4 PF
Provides students an opportunity to apply sociological theory and research while working in an agency or other organizational setting under supervision of department faculty. Must complete an internship agreement and secure approval from faculty member to sponsor internship.

SOCI 466 Independent Study 1-3

SOCI 470 Environmental Sociology 3
A substantive and theoretical introduction to the major issues in environmental sociology: the emergence and development of the environmental movement; the development of environmental issues; and how environmental issues are related to structural, contextual and perceptual factors.
PREREQ: SOCI201 and SOCI312
RESTRICTIONS: Requires upper division status.

SOCI 495 Field Experience in Criminal Justice 4 PF
See CRJU495 for course description.

SOCI 496 Practicum in Teaching 1-3 PF
Practical exposure to undergraduate education gained by assisting a member of the faculty in carefully supervised experiences such as discussion leader, crafting questions, consulting with students. May be repeated for up to three credit hours.
RESTRICTIONS: Requires permission of instructor. Not for major credit.

SOCI 605 Data Collection 3
A survey of methods and techniques for defining research problems and for gathering and ordering data in sociological research.
RESTRICTIONS: Requires permission of instructor.

SOCI 606 Qualitative Methodology 3
Focuses on research design, the logic of inquiry and an elaboration of selected issues introduced in SOCI605. Special emphasis on epistemological issues, methodological concerns central to the social sciences and non-positivist research strategies and techniques.

SOCI 607 Sociology of Sex and Gender 3
Reviews current research and theory in the sociology of sex roles and gender with particular attention to issues arising from the gender division of labor, feminism and social change, gender and the structure of social institutions, and the interaction of gender, race and class inequality. Introduces sociological theory and methodology as used and revised by scholars working on gender issues.

SOCI 608 Family, Work and Gender 3
Brings together studies of the workplace and studies of the family with special focus on areas of overlap. Throughout the course there will be a careful analysis of gender roles and the work/family overlap as well as focused discussion on issues of family policy.
RESTRICTIONS: Requires permission of instructor.

SOCI 611 Techniques of Demographic Analysis 3
Study of demographic equation (fertility, mortality and migration), population processes (composition and distribution) and the use of computers to analyze demographic data.

SOCI 612 Development of Sociological Theory 3
Historical survey of the development of sociology and sociological theory beginning with the period of the Social Contract theorists through the classic European theorists of the 19th century.

SOCI 614 Data Analysis 3
Methods of analyzing data in sociological research focusing on multivariate approaches.
PREREQ: SOC6105.

SOCI 621 Theories and Approaches in Social Deviance 3
General and specific theoretical orientations in the analysis of social deviance.

SOCI 622 Collective Behavior 3
Process and mechanisms operating in panics, riots, demonstrations and other disruptions of social order.

SOCI 628 Corporate and Governmental Deviance 3
Analyses and cases of internal organizational behavior when external efforts are made to have these behaviors treated as deviant. Also defenses used by the accused organizations, and preconditions for, and consequences of, successfully labeling and sanctioning an organization as deviant.

SOCI 629 Organizational Careers 3
Relationship between occupational careers and the organizations in which they are pursued. Process of recruitment, socialization, placement, promotion and succession.

SOCI 637 Law and Society in Historical Perspective 3
Examination of the social history of law, crime and legal institutions in the United States from colonial times to present. Focus is on the role law has historically played in allocating resources, structuring social relationships, and distributing political power. May be cross-listed with HIST657.

SOCI 655 Law and Society 3
Historical and structural development of legal systems. Emphasis on comparing legal systems in various cultures from Roman and Oriental law to Anglo-American legal systems.

SOCI 658 Social Science, Law and the Legal Process 3
Examines the relationship between social science and law. Reviews the use of social science research to understand the operation and impact of law and the legal system. Critically examines the growing use of social science testimony by the courts.

SOCI 661 Racial Stratification 3
Reviews the concept of race as a social historical category and examines the relationship of racial stratification to other systems of inequality. Also evaluates sociological theories of racial discrimination and institutionalized racism.

SOCI 813 Current Issues in Social Theory 3
Deals with current controversies in social theory such as the public/private distinction, the development of symbolic interactionism and Neo-Marxism.
RESTRICTIONS: Must have completed one graduate-level course.

SOCI 835 Seminar in Criminal and Delinquent Behavior 3
A review of the basic issues in the sociological study of criminal behavior, including definition and measurement, and the relationship between age, gender, race, peers, family, class and economy and crime.

SOCI 836 Seminar in Criminal and Delinquent Behavior 3
An analysis of the major forms of criminal behavior such as violent crime, property crime, public order crime, organized crime, white collar crime and juvenile delinquency.

SOCI 869 Master's Thesis 1-6 PF

SPAN 101 Elementary Spanish I 3
Introduction to the Spanish language and a development of speaking, listening, reading and writing skills through the use of basic texts.

SPAN 102 Elementary Spanish II 3
Completion of basic Spanish.
PREREQ: SPAN101 or SPAN105.

SPAN 105 Spanish I - Elementary 4
Introduction to the Spanish language and a development of speaking, listening, reading and writing skills through the use of basic texts.

SPAN 106 Spanish II - Elementary/Intermediate 4
Completion of basic Spanish. Increasing mastery of the basic skills of speaking, listening, reading and writing.
PREREQ: SPAN105.
RESTRICTIONS: Two to three years of high school Spanish acceptable in lieu of Prerequisite.

SPAN 107 Spanish III - Intermediate 4
Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty.
PREREQ: SPAN106.

SPAN 111 Intermediate Spanish I 3
Review of grammar. Increasing mastery of the basic skills of speaking, listening, reading and writing.
PREREQ: SPAN102 or SPAN106.
RESTRICTIONS: Three years of high school Spanish acceptable in lieu of Prereq.

SPAN 112 Intermediate Spanish II 3
Continued practice in speaking and writing, reading texts of average difficulty, grammar review as needed.
PREREQ: SPAN111.
RESTRICTIONS: Four years of high school Spanish acceptable in lieu of Prereq. Satisfies the Arts and Science foreign language requirement.

SPAN 200 Spanish Composition and Grammar 3
Intensive study of selected grammatical topics (subjective, se-estar, preterite and imperfect). Vocabulary exercises and short compositions.
PREREQ: SPAN107 or SPAN112.
SPAN 201 Spanish Reading and Composition 3
Major emphasis on reading development, composition and literary analysis.
PREREQ: SPAN 200

SPAN 205 Spanish Conversation 3
Practical use of Spanish by means of oral reports and discussions. Emphasis on improvement of basic conversational skills: Grammar review where appropriate, and/or some written work.
PREREQ: SPAN 107 or SPAN 112, or one 200-level course
RESTRICTIONS: Prerequisites require a minimum grade of B.
Not intended for native speakers.

SPAN 206 Culture through Conversation 3
Discussion of topics drawn from contemporary Spanish or Latin American life. For students who wish to broaden their knowledge of Hispanic culture while improving their oral and aural language skills.
PREREQ: SPAN 107 or SPAN 112
RESTRICTIONS: Taught abroad only.

SPAN 207 Contemporary Latin America I 3
Introduction to contemporary Latin America, its culture, its people, their way of life and the issues confronting them.
RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy Arts & Science foreign language requirement. May be repeated for credit when taken on different study abroad programs.

SPAN 208 Contemporary Spain I 3
Introduction to contemporary Spain, its culture, its people, their way of life and the issues confronting them.
RESTRICTIONS: Taught abroad, in both English and Spanish. Not for major credit. Does not satisfy Arts and Science foreign language requirement.

SPAN 250 Introduction to Business Spanish 3
Familiarizes students with characteristics of business Spanish (terminology, letter writing, etc.) and policies and practices of the Hispanic business community.
PREREQ: SPAN 107 or SPAN 112.

SPAN 254 Latin America in the News 3
Explores topics in contemporary Latin American society, culture and politics as expressed in the news media. Emphasis on current events and issues of Latin America. Focus of study is the Latin American press: newspapers and magazines printed in the Latin American language.
PREREQ: Any 200-level course taught in the Spanish language.

SPAN 255 Spain in the News 3
Explores topics in contemporary Spanish society, culture and politics as expressed in the news media. Emphasis on current events and issues of Spain. Focus of study is the Spanish press: newspapers and magazines printed in the Spanish language.
PREREQ: Any 200-level course taught in the Spanish language.

SPAN 301 Survey of Spanish Literature 3
Development of Spanish literature from its origins through the 17th century. Study of representative works, discussions and collateral readings.
PREREQ: SPAN 201.

SPAN 302 Survey of Spanish Literature 3
Spanish literature from the 18th century to the present. Selection of representative works, discussions and collateral readings.
PREREQ: SPAN 201.

SPAN 303 Survey of Spanish-American Literature 3
Representative works in all genres of Latin American literature from pre-Columbian to Modernism.
PREREQ: SPAN 201.

SPAN 304 Survey of Spanish-American Literature 3
Representative works in all genres of Latin American literature in the 20th century.
PREREQ: SPAN 201.

SPAN 305 Oral Communication 3
For individuals with a comprehensive knowledge of Spanish grammar and vocabulary. Emphasis on refinement of expression of abstract ideas as well as mastery of practical communication.
PREREQ: SPAN 200
RESTRICTIONS: Not intended for native speakers.

SPAN 306 Practical Oral/Written Expression 3
Strengths skills in grammar and vocabulary in preparation for advanced courses. Includes oral and written communication, discussion of articles and videos, textual analysis and compositions.
PREREQ: Any two 200-level Spanish courses conducted in Spanish.
RESTRICTIONS: Taught abroad only.

SPAN 308 Contemporary Spain II 3
Discussion and study of issues related to contemporary cultural, political and social developments in Spain. Emphasis on the role of modern and contemporary Spain in the European community.
PREREQ: Any two 200-level Spanish courses taught in the Spanish language.
RESTRICTIONS: Taught abroad and in Spanish.

SPAN 314 Spanish Phonetics and Phonology 3
PREREQ: SPAN 200
RESTRICTIONS: Recommended for prospective teachers.

SPAN 325 Spanish Civilization and Culture 3
Survey of geography, history, art and society of Latin America.
PREREQ: SPAN 200.

SPAN 326 Latin American Civilization and Culture 3
Survey of geography, history, art and society of Latin American lands.
PREREQ: SPAN 200.

SPAN 350 Advanced Business Spanish 3
Development of strategies to initiate and maintain oral and written communication in the world of business. Practice in speaking Spanish in business situations, letter writing and article reading. Functional and cultural approach.
PREREQ: Any two 200-level Spanish courses, one preferably being SPAN 250.

SPAN 355 Special Topics 3
Explores an area of special interest in Spanish literature or culture studies. Subject matter varies and will be announced in the registration brochure.
PREREQ: SPAN 200.
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 366 Independent Study 1-3

SPAN 401 Advanced Spanish Grammar 3
A systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises.
PREREQ: Any 300-level Spanish course.

SPAN 403 History of the Spanish Language 3
History of the language from Latin to the present. Historical phonology and morphology.
PREREQ: Any 300-level Spanish course.

SPAN 406 Advanced Spanish Language 3
Advanced grammatical structure and stylistics with special attention given to technical vocabulary and discourse (e.g., business, law, science, agriculture).
PREREQ: Any 300-level Spanish course.

SPAN 415 Latin American Literature and its Political Context 3
Analysis of selected works by contemporary Latin American authors, focusing on the techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years.
PREREQ: One SPAN 300-level survey of literature.

SPAN 416 Cervantes: Don Quijote 3
PREREQ: One SPAN 300-level survey of literature.

SPAN 417 Hispanic Nobel Prize Authors 3
Covers the works of Spanish and Latin American Nobel Prize authors - Echeverray, Benavente and Martinez, Matral, Jimenez, Austurias, Alejandro, Neruda and Garcia Marquez - in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies.
PREREQ: One SPAN 300-level survey of literature.

SPAN 418 God, Man and Woman 3
Analysis of the presentation of God, man and woman in a selection of narrative poems, dramas and novels from the 15th to the 17th centuries. Authors studied include Santillana, Diego de San Pedro, Alfonso, Juan de la Cueva, Cervantes, Luis de Leon, Gariano and Quevedo.
PREREQ: One SPAN 300-level survey of literature.

SPAN 430 Latin American Novel and Cinema 3
Study of a selection of novels of the 20th century that have brought international recognition to the Latin American writers. These novelists depict the social, economic, political and cultural traits of their respective countries. Film versions of some of the novels illustrate artistic interpretations of the subject matter.
PREREQ: One SPAN 300-level survey of literature.
SPANISH

SPAN 433 Modern Spanish Literature 3
Spanish drama and lyric poetry from Romanticism to contemporary period
PREREQ: One SPAN 300-level survey of literature.

SPAN 434 Modern Spanish Literature 3
Prose from realism to the present
PREREQ: One 300-level survey of literature

SPAN 436 Studies in the Literature of the Spanish Golden Age 3
The poetry and prose of the 16th and 17th centuries.
PREREQ: One SPAN 300-level survey of literature

SPAN 439 Postwar Spanish Narrative 3
The Spanish novel from 1962 to the present. Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goytisolo, Juan Benet, Carmen Martin Gaite, Ana Maria Maiz and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.
PREREQ: One SPAN 300-level survey of literature

SPAN 447 Contemporary Hispanic Fiction by Women 3
Explores current fiction by women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also situates them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.
PREREQ: One 300-level survey of Spanish literature course.

SPAN 448 The Theatre of the Spanish Golden Age and Its Legacy 3
Compares the masters of the Golden Age Theatre with today's internationally-known Spanish playwrights. Studies the comedies of Tirso de Molina, Lope de Vega, Calderon de la Barca, and finds their legacy in the plays of Saavedra, Zorrilla, Garcia Lorca and Casasola. Investigates the sources and interpretation of the contemporary theatre, and how they have been influenced by the earlier dramatists.
PREREQ: One SPAN 300-level survey of literature.

SPAN 449 Contemporary Spanish Theatre 3
Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Bueno Vallejo and Sastré.
PREREQ: One SPAN 300-level survey of literature.

SPAN 482 Advanced Spanish Grammar 3
Systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises.

SPAN 484 Contemporary Spanish Theatre 3
Twenty-first-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Bueno Vallejo and Sastré.
PREREQ: One SPAN 300-level survey of literature.

SPAN 485 Selected Authors, Works and Themes 3
Works of one or more outstanding authors or on a special theme
PREREQ: One SPAN 300-level Spanish literature course.

SPAN 486 Independent Study 1-3

SPAN 487 Seminar: Topics in Spanish Literature 3
Study of selected topics, authors and works in the various fields of Spanish literature. Variable content. Emphasizes preparation of seminar presentations and term papers.
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 491 Contemporary Spanish Poetry 3
Analysis of Spanish poetry from Beccer to the present day.
PREREQ: One SPAN 300-level survey of literature.

SPAN 492 The Theatre of the Golden Age and Its Legacy 3
Covers the Spanish novel from 1962 to the present. Focuses on novels by leading authors such as Luis Martin-Santos, Juan Goytisolo, Juan Benet, Carmen Martin Gaite, Ana Maria Maiz and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.

SPAN 493 Contemporary Hispanic Fiction by Women 3
Explores current fiction by women in Spain and Spanish America. Analyzes selected works as individual literary creations, and also situates them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.
PREREQ: One 300-level survey of Spanish literature course.

SPAN 495 Selected Authors, Works and Themes 3
Works of one or more outstanding authors or on a special theme
RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 496 The Theatre of the Spanish Golden Age and Its Legacy 3
Compares the masters of the Golden Age Theatre with today's internationally-known Spanish playwrights. Studies the comedies of Tirso de Molina, Lope de Vega, Calderon de la Barca, and finds their legacy in the plays of Saavedra, Zorrilla, Garcia Lorca and Casasola. Investigates the sources and interpretation of the contemporary theatre, and how they have been influenced by the earlier dramatists.
PREREQ: One SPAN 300-level survey of literature.

SPAN 497 Contemporary Spanish Theatre 3
Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Bueno Vallejo and Sastré.
PREREQ: One SPAN 300-level survey of literature.

SPAN 500 Basic Statistical Practice 3
Uses real data from a variety of disciplines to explore topics in data analysis, estimation and inference such as graphical displays, estimation of and hypothesis tests on means and proportions, sampling distributions, confidence intervals, analysis of variance, simple linear regression, chi-square tests for independence.
PREREQ: College algebra.

STAT 201 Introduction to Statistical Methods I 3
Exploratory analysis, basic probability, discrete and continuous distributions, sampling distributions and confidence intervals, and hypothesis tests on means and proportions. Emphasis is on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: College algebra.

STAT 202 Introduction to Statistical Methods II 3
Two-sample tests on means and proportions, chi-square analysis of contingency tables, complete and randomized block designs, analysis of variance, simple linear and multiple regression, model diagnostics, quality control, time series analysis. Emphasis on applications in business and economics. Statistical computing is an integral part of this course.
PREREQ: STAT 201

STAT 250 Engineering Probability and Statistics 3
Basic principles and uses of probability and statistics in engineering examples of risk and variability. Sample spaces, probability distributions, Monte Carlo Method, derived distributions, sampling, tests of hypothesis and regression.
PREREQ: MATH 243

STAT 300 Statistical Methods and Theory 4
Exploratory data analysis, probability, estimation, classical statistical inference, regression, multiple regression. Laboratory covers use of statistical packages.
PREREQ: MATH 210 and MATH 243.
STAT 366  INDEPENDENT STUDY  1-6

STAT 370  INTRODUCTION TO STATISTICAL ANALYSIS I  3
Basic probability; continuous, discrete and joint distributions; distribution of functions of random variables; order statistics; expected value and central limit theorem.
PREREQ: MATH222 or MATH243

STAT 371  INTRODUCTION TO STATISTICAL ANALYSIS II  3
Distributions of common statistics, sampling techniques, estimation, confidence intervals, hypothesis testing and selected topics.
PREREQ: STAT370

STAT 418  SAMPLING METHODS  3
Types of sampling, census vs. survey, methods of sample selection, sampling and non-sampling errors. Planning and execution of surveys, and data collection in selected fields of application.
PREREQ: STAT371

STAT 420  DATA ANALYSIS AND NONPARAMETRIC STATISTICS  3
Techniques of exploratory and graphical data analysis for univariate and multivariate data sets, and numerical and categorical variables. Emphasis on selection of proper procedure. Non-parametric techniques of estimation testing and curve smoothing.
PREREQ: STAT371

STAT 450  STATISTICS FOR THE ENGINEERING AND PHYSICAL SCIENCES  3
Combinatorial probability; distribution theory; estimation and hypothesis testing. Experimental design, analysis of variance and regression theory.

STAT 466  INDEPENDENT STUDY  1-6

STAT 475  STATISTICS FOR ENVIRONMENTAL SCIENCE  3
Introduction to statistical methods for analyzing environmental data. Relevant probability and sampling theory is introduced, as well as procedures for summarizing, modeling and estimating and making inferences from environmental data, especially data distributed over space and/or time. A computer-based statistical package is used to explore behavior of different statistical techniques with a variety of environmental data sets. May be cross-listed with GEOG475.
PREREQ: MATH243 and GEOG250
RESTRICTIONS: If MATH475 is taken, degree credit cannot be given for any of the following courses: STAT300, STAT1370, STAT1371 or STAT450

STAT 611  REGRESSION ANALYSIS  3
Simple linear and nonlinear regression. Subset regression; principal component and ridge regression. Introduction to experimental design and design models.
PREREQ: STAT202, STAT371

STAT 615  DESIGN AND ANALYSIS OF EXPERIMENTS  3
Fundamental principles of design, randomized designs, Latin squares, sources of error, components of error, factorial designs, response surfaces, models for design.
PREREQ: STAT371

STAT 616  DESIGN AND ANALYSIS OF EXPERIMENTS  3
Planning of experiments, designs for specific problems, fractional factorials, quasi-factorial experiments, balanced and unbalanced designs, confounding, introduction to linear estimation.
PREREQ: STAT371

STAT 657  STATISTICS FOR EARTH SCIENCES  3
Spatial distributions; directional data; statistical graphics, regression and time series analysis; model validation; sampling; principal components; cluster analysis; discriminant analysis; and statistical software routines. May be cross-listed with GEOG657.
PREREQ: STAT201

STAT 969  DOCTORAL DISSERTATION  1-12 PF

THEATRE

THEA 102  INTRODUCTION TO PERFORMANCE  3
A survey of performance training techniques for the non-major, including the elements of voice, improvisation, movement, dance, character analysis and portrayal.

THEA 104  INTRODUCTION TO THEATRE AND DRAMA  3
Survey of the elements of theatre and drama. Includes attendance at theatrical productions, readings of representative plays, discussion of a method of dramatic analysis, explanation of staging in periods of major importance and discussion of the actor, the designer and the director.

THEA 106  THE THEATRICAL EXPERIENCE ABROAD  3
Survey of the elements of performance, theatre and drama in relationship to observed field performances. Attendance at rigorous program of theatrical performances. Studies elements of voice, improvisation, movement, dance, character analysis and portrayal specifically based on observed performances.
RESTRICTIONS: Taught abroad

THEA 200  INTRODUCTION TO THEATRE PRODUCTION  3
Processes involved in the production of scenery, properties, lighting, sound and costumes for live performance events. Plays read and analyzed for production requirements.
RESTRICTIONS: Mandatory attendance at performance events.

THEA 202  INTRODUCTION TO THEATRE DESIGN  3
Survey of the evolution of design theory and aesthetics for live production. Elements include the design of scenery, properties, costumes, lighting and sound. Plays read and analyzed for design requirements.
RESTRICTIONS: Mandatory attendance at performance events.

THEA 203  INTRODUCTION TO COSTUMING  3
Explores the evolution of costume design and technology. Discusses and analyzes all aspects of costuming through reading of plays.

THEA 204  INTRODUCTION TO VOICE AND SPEECH  3
The use of voice and speech in performance. Includes exercises to develop relaxation, breath support, resonance, vocal strength, optimum pitch and articulatory precision, as well as studies in basic vocal anatomy. Studio format.
RESTRICTIONS: Involves some strenuous physical activity.

THEA 205  INTRODUCTION TO MIME  3
Explores the theory and practice of theatrical performance without words. Theories of DelCanto, Laban, Decroux and others. Students engage in learning and performing short mime pieces for class.

THEA 206  INTRODUCTION TO DANCE  3
Examines the function and impact of dance in the lives of individuals, societies, and cultures. Lecture and participatory format.

THEA 207  TECHNICAL PRODUCTION PRACTICUM  1-4
Laboratory course for the production of scenery, properties, lighting and sound for public performances of the Professional Theatre Training Program Productions.

THEA 209  COSTUME PRODUCTION PRACTICUM  1-4
Laboratory course for the production of costumes and costume crafts for public performances of the Professional Theatre Training Program Productions.

THEA 226  FUNDAMENTALS OF ACTING  3
Exploration of basic elements of the actor's art and craft so as to deepen and broaden the experience of viewing the theatre. May utilize theatre games, basic text work, improvisation and lecture/demonstrations.

THEA 236  FUNDAMENTALS OF JAZZ DANCE  3
Jazz Dance as an art form and vehicle for individual and group expression. Emphasis on rhythm and style.
RESTRICTIONS: Previous dance experience recommended.

THEA 300  FUNDAMENTALS OF STAGECRAFT  3
Concentrates on traditional techniques used in the construction and rigging of scenery and properties for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA200

THEA 301  FUNDAMENTALS OF PROPERTIES CONSTRUCTION  3
Introduces basics of organization and management of properties for a theatrical production in addition to basic techniques of property construction. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA200

THEA 302  FUNDAMENTALS OF STAGE LIGHTING  3
Introduces basic techniques and processes used in the lighting of theatrical productions. Emphasis on the use and manipulation of lighting equipment. Demonstrates equipment and basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA200.
THEA 303 Fundamentals of Scene Painting 3
Introduction to the tools, materials, and techniques of painting scenery for the stage. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA 200.

THEA 304 Fundamentals of Audio for the Theatre 3
Introduces the physical phenomenon of sound and the techniques of controlling and manipulating it for theatrical productions. Demonstrates basic techniques and processes through a combination of classroom lecture and laboratory experience.
PREREQ: THEA 200.

THEA 305 Fundamentals of Costume Construction for the Stage 3
Introduces basic costume construction techniques through lectures, demonstrations, and laboratory experience. Culminates in the construction of a finished costume.
PREREQ: THEA 203.

THEA 307 Fundamentals of Draping for the Stage 3
Teaches basic draping skills and applies them to period costumes. Examines several historical periods commonly used in theatrical productions. Students create muslins or finished garments from at least four historical periods.
PREREQ: THEA 203.

THEA 308 Fundamentals of Costume Crafts 3
Provides basic experience in several crafts-related areas commonly utilized in costuming, including maskmaking, surface design, hatmaking, leather work, and thermoplastics.
PREREQ: THEA 203.

THEA 309 Fundamentals of Stage Management 3
Study of the techniques and procedures used in managing theatrical productions from conception through performance.
PREREQ: THEA 200.

THEA 310 Fundamentals of Maskmaking 3
Class will include casting, sculpting human and animal features, and will explore various methods and materials for constructing theatrical masks. Students will construct three to four masks.
PREREQ: THEA 203.

THEA 341 Theatre/Drama: Classic/Medieval 3
Survey of major historical and theoretical developments in theatre practice and dramaturgy during the period. Readings in primary and secondary historical sources, major critical and theoretical texts, and representative plays of the period. May be cross-listed with CMIT 341.

THEA 345 History of Theatre: American Musical Theatre 3
See MUSC 345 for course description.

THEA 347 Special Topics in Theatre History 3
A series of changing topics in history and theory. Topics range from studies of significant movements in theatre to the study of theoretical issues and individual playwrights and genres.

THEA 366 Independent Study 1-6

THEA 407 Theatre Practicum for Majors 1-4
Students assigned production responsibilities on departmental productions in the areas of lighting, sound, scenery, properties, costume, stage management, painting, and theatre management.
RESTRICTIONS: Open to majors only. Requires permission of instructor.

THEA 420 Fundamentals of Stage Directing 3
Exploration of the director's part in the creative process of theatre. Philosophy, techniques, and problems of directing plays.
PREREQ: THEA 104.

THEA 466 Independent Study 1-6

THEA 490 Seminar in Theatre and Drama 3
Seminar in theatre and drama. Topics will be announced.
RESTRICTIONS: Requires permission of instructor.

THEA 600 Distinctions of Professional Theatre Practice 1
Inquiry into the nature of the theatre as an art form; techniques and issues of communication, organization, management, leadership, team participation, and creativity necessary to the pursuit and accomplishment of fulfilling careers in institutional and commercial theatres. Explores how the nature and purpose of the theatre as an art informs the day-to-day practices, values, and behavior of the individual artist.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program. May be repeated for up to six credit hours.

THEA 601 Dynamics 1
A vocal/physical warmup. Exercises designed to prepare student for the day's work.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to six credit hours.

THEA 602 Voice Development IA 1
Basic breath control and tone production to develop strength, control, flexibility and awareness.
RESTRICTIONS: Requires enrollment in the Professional Theatre Program/Acting or Directing.

THEA 603 Voice Development IB 1
Continuation of THEA 602.
PREREQ: THEA 602.

THEA 604 Voice Development IIA 1
Continuation of THEA 603, with an emphasis on range extension and the development of greater variety in expressiveness.
PREREQ: THEA 603.

THEA 605 Voice Development IIB 1
Continuation of THEA 604.
PREREQ: THEA 604.

THEA 606 Voice Development IIIA 1
Individual instruction to identify habitual vocal patterns and to strengthen individual weaknesses in voice.
PREREQ: THEA 605.

THEA 607 Voice Development IIIB 1
Continuation of THEA 606.
PREREQ: THEA 606.

THEA 608 Stage Movement IA 1
Exercises and assignments to develop alignment, strength, flexibility, control, awareness, endurance, rhythmic sensitivity, balance, and expressiveness.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 609 Stage Movement IB 1
Continuation of THEA 608.
PREREQ: THEA 608.

THEA 610 Stage Movement IIA 1
Continuation of THEA 609, with an emphasis on stage combat, tumbling, circus and other advanced movement techniques.
PREREQ: THEA 609.

THEA 611 Stage Movement IIB 1
Continuation of THEA 610.
PREREQ: THEA 610.

THEA 612 Stage Movement IIIA 1
Individual instruction to identify habitual movement patterns and to strengthen individual weaknesses in stage movement.
PREREQ: THEA 611.

THEA 613 Stage Movement IIIB 1
Continuation of THEA 612.
PREREQ: THEA 612.

THEA 614 Stage Speech IA 2
Ear training and phonetics. Corrective work on regional speech habits.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting or Directing.

THEA 615 Stage Speech IB 2
Continuation of THEA 614. Beginning work on verse scansion.
PREREQ: THEA 614.

THEA 616 Stage Speech IIA 1
Continuation of THEA 615 with an emphasis on phrasing and verse scansion.
PREREQ: THEA 615.

THEA 617 Stage Speech IIB 1
Continuation of THEA 616.
PREREQ: THEA 616.

THEA 618 Stage Speech IIIA 1
Stage dialects and advanced work in phrasing and verse scansion. Individual tutoring in problem areas.
PREREQ: THEA 617.

THEA 619 Stage Speech IIIB 1
Continuation of THEA 618.
PREREQ: THEA 618.
THEA 620 REHEARSAL AND PERFORMANCE/ACTING 1-6
Practical instruction and assignments in the preparation, rehearsal, and performance of theatrical productions.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Acting. May be repeated for up to 24 credit hours.

THEA 633 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES I 1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management.

THEA 634 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES II 1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA633

THEA 635 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIA 1-2
Development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA634

THEA 636 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIB 1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA635

THEA 638 STAGE MANAGEMENT ORGANIZATIONAL AND MANAGERIAL TECHNIQUES IIIC 1-2
Further development of organizational structuring and communication techniques for the administration of stage managerial projects.
PREREQ: THEA637

THEA 639 STAGE MANAGEMENT PRODUCTION SKILLS IA 1-2
Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management.

THEA 640 STAGE MANAGEMENT PRODUCTION SKILLS IB 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA639

THEA 641 STAGE MANAGEMENT PRODUCTION SKILLS IICA 1-2
Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA640

THEA 642 STAGE MANAGEMENT PRODUCTION SKILLS IICB 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA641

THEA 644 STAGE MANAGEMENT PRODUCTION SKILLS IICC 1-2
Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.
PREREQ: THEA643

THEA 645 REHEARSAL AND PERFORMANCE/STAGE MANAGEMENT 1-5
Practical instruction and assignments in the preparation, rehearsal, and performance of theatrical productions.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Stage Management. May be repeated for up to 24 credit hours.

THEA 648 COSTUME CONSTRUCTION 1
Introductory course exploring the mechanics and technology of the art of costuming. Surveys all aspects of the costume’s craft including practical work in the costume shop.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Construction.

THEA 664 INTERNSHIP IN PROFESSIONAL THEATRE 1-9
Engagement with professional theatre in individual discipline area.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 18 credit hours.

THEA 665 THEATRE LITERACY 2
Discussion, research, and practice in theatre terminology, literature and history.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 12 credit hours.

THEA 668 RESEARCH 1-6

THEA 674 SCENERY PRODUCTION 1
Materials, tools, hardware and construction methods used for scenery construction.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 675 PROPERTIES PRODUCTION 1
Concentrates on property production techniques with emphasis on properties management, acquisition, and health and safety.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 676 SCENERY: METALWORKING 1
Materials, tools and methods of working with metal for scenery construction.
PREREQ: THEA674

THEA 677 PROPERTIES: UPHOLSTERY AND DRAPERY 1
Tools, materials and methods for upholstery and drapery.
PREREQ: THEA675

THEA 678 PROPERTIES: CASTING AND MOLD-MAKING 1
Tools, materials and methods for sculpting, casting and mold-making techniques.
PREREQ: THEA675

THEA 679 SCENERY: STAGE RIGGING 1
Tools, hardware and methods of rigging scenery. Emphasis on standard theatre rigging systems.
PREREQ: THEA674.

THEA 680 LIGHTING PRODUCTION 1
Electrical theory and practice as applied to theatre production. Emphasis on current lighting production practice, systems and equipment.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 681 AUDIO PRODUCTION 1
Sound theory and practice as applied to contemporary theatre production. Emphasis placed on utilizing current systems, equipment and technology for audio production.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program/Technical Product.

THEA 682 LIGHTING DESIGN 1
Essential skills and procedures for creating, documenting and realizing a lighting design for a theatrical production.
PREREQ: THEA680.

THEA 685 ELECTRICS AND AUDIO PRODUCTION IIIA 1
Continuation of THEA684, with emphasis on advanced mixing and editing techniques and advanced electrical control techniques.
PREREQ: THEA684.

THEA 686 INFORMATION TECHNOLOGIES FOR THEATRE 1
Application of computer software to theatrical production practice. Emphasis is placed on CAD (drafting) techniques for theatre production.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 687 SCENERY PAINTING 1
Painting tools, materials, color theory and scenery painting techniques for theatrical production.
RESTRICTIONS: Requires enrollment in Professional Theatre Training Program/Technical Product.

THEA 688 CAD AND SCENERY CONSTRUCTION 1
Continued work on CAD (drafting) with emphasis on construction work drawings for scenery construction. Further study of standard and specialized scenery construction methods.
PREREQ: THEA686.

THEA 689 ADVANCED SCENERY PAINTING 1
Continuation of THEA 687, with emphasis on wood and marble techniques, columns and other three-dimensional forms, and stenciling techniques for painting wallpaper.
PREREQ: THEA687.

THEA 690 ADVANCED CAD 1
Techniques for solving advanced problems in analytical geometry with 2D and 3D CAD.
PREREQ: THEA688

THEA 691 PAINTING, GRAPHICS AND DESIGN FOR PRODUCTION IIIIB 1
Continuation of THEA690, with emphasis on advanced work in scene painting and drafting.
PREREQ: THEA690
THEA 692 Production and Performance/Technical 1-4
Practical instruction and assignments in the technical preparation and production of Professional Theatre Training Program public performances. Assignments include but are not limited to: Master Carpenter, Master Electrician, Property Master, Audio Engineer, Scenic Artist and Technical Director.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production. May be repeated for up to 20 credit hours

THEA 693 Production Coordination 1
Development of management and communication techniques for effective interaction among stage management, costume production and technical production areas of theatre.
RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 6 credit hours

THEA 694 Special Topics in Theatre Production 1-3
Multiple units on advanced topics in theatre production and management. Students select topics from a list of 5-6 available topics offered by PTP production faculty.
RESTRICTIONS: Requires enrollment in the Professional Theater training Program. May be repeated for up to 9 credits.

URBAN AFFAIRS AND PUBLIC POLICY

UAPP 605 Topics in Urban Affairs 3
Focuses on selected topics in urban affairs such as urban politics and government, urban education and neighborhood analysis.
RESTRICTIONS: May be repeated for up to nine credits when topics vary

UAPP 606 Local Economic Development: Policy and Practice 3
Examines theory and contemporary practice for promoting the economic development of local communities. Reviews alternative ways of understanding the dynamics of local economic development and devising strategies that will benefit community residents.

UAPP 607 Seminar in Community Development and Nonprofit Leadership 3
Examines the complex ways in which the concepts of community analysis and development are used and understood. Students connect the concepts to issues, problems or policy alternatives affecting local communities by participating in applied projects. May be cross-listed with PSST607.

UAPP 608 Poverty, Neighbors and Community Development 3
Examines social science literature through which multidisciplinary analysts have described and explained poverty, analyzed neighborhoods, and categorized community development efforts. Focusing on the United States, particular attention is paid to analyses from 1960 to the present. May be cross-listed with PSST608.

UAPP 610 Urban Land Use Planning and Administration 3
Interaction of political, economic and social forces in the planning and land use control process. Emphasis on planning agency administration and current policies impacting the planning process, including recently enacted environmental and community development legislation. Concern for the role of the planner, the planning agency and the planning function as it relates to economic and community development.

UAPP 612 Urban Housing Policy and Administration 3
Problems associated with providing adequate and affordable housing in the U.S. The structure and dynamics of the housing market; demand and supply factors; market failure; financing methods; and federal, state and local public policy affecting housing, including taxation, regulation, subsidy programs, and land use controls.

UAPP 613 Planning Theory and Urban Policy 3
Provides an overview of the development and current conceptual normative and methodological issues in planning theory as applied to urban regions.

UAPP 614 The American Suburb 3
An examination of the historical and geographical origins of the American suburb and its role in metropolitan development and larger society. Includes the evolution of the streetcar and automobile suburbs with special emphasis on the post World War II suburban boom and contemporary post-suburban trends. May be cross-listed with GEOG614 and/or HIST614

UAPP 615 Urban, Regional and Environmental Planning 3
Provides an introduction to urban planning. Fociuses mainly on U.S. but some comparisons made with Britain and Canada. Issues covered include zoning, urban growth management, land policies, regional policies and urban policy. May be cross-listed with GEOG615

UAPP 616 Urban Community Organization Seminar 3
Studies the varied community organization concepts, methods and models, and analyzes the organizational structure and service delivery systems of selected social agencies that sponsor community organization and social action activities.

UAPP 618 Human Service Systems: Policy, Practices, Administration 3
Centers on operational practices and administration of human service systems. Includes an analysis of human service systems concepts and policies, delivery practices and administration. Human service systems dimensions reviewed in relation to the rising influence of organized human service professional (practitioner) groups and organized human service consumer groups.

UAPP 622 Resources, Development and the Environment 3
See GEOG622 for course description

UAPP 623 Independent Study in Geographical Information Systems (GIS) 1
Students complete self-paced individualized tutorials and apply knowledge in a project of their choice. Material addressed includes creation and display of digital maps and data bases, preparation of data sets, sources of data and GIS standards.

UAPP 624 Seminar in Criminal Justice 3
Discussion and evaluation of institutional components of criminal justice systems. Topics include police, judicial and correctional systems.

UAPP 625 Energy Policy and Administration 3
See POSC624 for course description.

UAPP 626 Conservation and Renewable Energy Policy 3
Covers current policy issues for energy conservation, energy efficiency, and renewable energy sources. Sources prior background in energy policy is assumed, and the course will go into substantial depth. Topics will include environmental impacts, utility programs, and international comparisons. May be cross-listed with MAST622 and/or POSC626.

UAPP 627 Comparative Environmental Politics 3
Examines the effect of institutional and systemic factors in the formulation and implementation of environmental policy in several developed and developing countries. Considers the impact of modes of political participation, level of development, and type of political economy on policy. May be cross-listed with MAST626 and/or POSC626.

UAPP 628 Issues in Land Use and Environmental Planning 3
See GEOG628 for course description.

UAPP 629 Seminar in Historic Preservation 3
Survey of historic preservation and management of cultural resources examining cultural contexts and public policy. Covers techniques of preservation, legal and legislative basis of preservation programs, with particular attention to National Register of Historic Places. May be cross-listed with ART625, HIST625 and/or MAST625.

UAPP 630 Methods in Historic Preservation 3
Upper-level field research seminar concentrating on developing graphic, photographic and narrative skills for architectural documentation. Involves classroom and field sessions. May be cross-listed with ART634 and/or HIST634.

UAPP 632 Making the American City 3
Advanced research and reading seminar on the materialization of early American cities. Examination of historical and cultural issues related to housing, consumerism, gender, ethnicity, craft, poverty and wealth as a means to interpreting the city as artifact and symbolic setting. Includes field trips to cities in the region. Students will work with primary sources including archaeological materials, architecture and documentary evidence. May be cross-listed with ART632 and/or HIST632.

UAPP 634 Housing Finance and Development 3
Fundamentals of real estate and housing finance. Various methods available to finance the development of real estate. Financial institutions and institutions involved in each phase. Relevant tax laws and likely tax consequences. Development of public policy as it affects the availability of housing credit. The function, operation and regulation of financial and related institutions, including FHA, FNMA, GNMA, FHLMC and PHLMC.

UAPP 635 The Evolution of the American Urban Landscape 3
Reading and research seminar on the evolution of the American urban landscape from approximately 1850 to the present. Examination of historical, cultural and geographical issues and processes related to industrialization and capitalism, technology, gender and ethnicity, housing, poverty and wealth as a means of understanding the formation of the historic American urban landscape. Includes field trips to cities in the region. May be cross-listed with GEOG635 and/or HIST635.

UAPP 636 Research Topics in Historic Preservation 3
Seminar that addresses a specific research issue within historic preservation including hypothesis construction, design of research methodology and evaluation of results. Emphasis on the use of primary sources and application of database techniques. May be cross-listed with ART622, GEOG635 and/or HIST636.

UAPP 638 World Cities in Comparative Perspective 3
See GEOG638 for course description.

UAPP 640 International and Development Administration 3
See POSC640 for course description.

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UAPP 645 Public Sector Labor Relations 3
An overview of employer-employee relations in state and local governments. Emphasis on the economic and political environment, institutional responses to collective bargaining, and economic and political outcomes of the bargaining process. Some emphasis on development of skills in grievance handling and arbitration.

UAPP 647 Philosophy of Technology 3
See PHIL 447 for course description.

UAPP 648 Environmental Ethics 3
See PHIL 448 for course description.

UAPP 654 Vernacular Architecture 3
See HIST 654 for course description.

UAPP 655 Social Environment and Health 3
Examines the relation between socioeconomic structure and health as a descriptive and conceptual framework for health policy analyses at national and local levels. Views relations between health levels and socioeconomic structure, and changes in socioeconomic structure from spatial and historical perspectives. Dimensions of socioeconomic structure include income, education, occupation, industry, employment and ethnicity.

UAPP 656 Politics and Disaster 3
See POSC 656 for course description.

UAPP 657 Health Policy 3
Objective is to provide students with a basic understanding of the U.S. health system and give them practical experience in analyzing how health reform and health policy more generally affect various sectors of the economy.

UAPP 658 Contemporary Issues in Public Administration 1
Focus on "cutting edge" issues in the field of public administration and public affairs, including the role of those in public administration as they seek to establish more clearly the role of administrators in the governance process.

UAPP 659 Topics in Public Administration 3
Focuses on micro and macro Public Administration issues, i.e., privatization, health care cost containment, flex benefits packages, ethics, organizational productivity, concession and productivity bargaining. May be cross-listed with POSC659.

UAPP 660 Seminar in Urban Management 3
Provides a theoretical and conceptual orientation to urban management, perspectives on the development of urban management as a profession, a description of the intergovernmental, sociopolitical and economic environment of urban management, and analyses of current issues and trends.

UAPP 662 Municipal Management 3
Surveys the major operational functions of local government with emphasis on the practical elements and problems in the management of these functions. Functions include solid waste disposal, economic development, planning and land use control, water supply, police and emergency services, and cultural, social and recreational services. Emphasis on innovative approaches to the provision of services.

UAPP 664 Case Studies in State and Local Management 3
Uses analyses of cases in state and local decision making to enable students to improve their communication, decision making and management skills. Cases deal with a broad range of subject areas (e.g., health and recreation) and problems (e.g., facility location and personnel).

UAPP 678 Coastal and Maritime Law 3
See MAST 678 for course description.

UAPP 681 Metropolitan Infrastructure and Transportation 3
Movement is essential for metropolitan area performance. Roads and water systems are infrastructure components that impact on where houses, stores, and jobs are located; which in turn links into movement, pollution and congestion. This course treats infrastructure decision making using approaches from public economics. May be cross-listed with POSC 681.

UAPP 683 Regional Policy Analysis 3
Why do some regions grow and change? Course presents theories of regional development, methods of interregional analysis, as well as national/regional topics such as land use, migration, cities, suburban shifts, and neighborhoods. Various kinds of regional policies are analyzed. May be cross-listed with POSC 683.

UAPP 685 Personnel and Human Resource Issues: Current Topics 3
Analysis of selected policies, practices, and issues currently important in the field of public personnel/human resources. Topics vary depending on instructor. Illustrations: EEO developments, "Glass Ceiling" issues, ADA, benefits/cost containment, labor negotiation trends, the changing workforce and workplace. Seminar with individually-tailored projects. May be cross-listed with POSC 685.

UAPP 687 State and Local Government: Concept and Issues 3
Explores the state and local government context in which public managers work. Examines the organizational, administrative, and economic forces shaping state and local public action, as well as the political decision making apparatus used by subnational governments. Assesses their contemporary role in the federal system. May be cross-listed with POSC 687.

UAPP 688 State Government Policy and Management 3
Focuses on roles and functions of United States state government. Topics include legislative policy making and operations, executive branch organization and functions, structure and role of state courts, role of the governor and the states in intergovernmental policy making. State government in the Middle Atlantic region will receive special attention. May be cross-listed with POSC 688.

UAPP 689 Environmental Values, Movements and Policy 3
See MAST 692 for course description.

UAPP 690 Research Design and Methodologies 3
Provides skills and examines issues in research design, data acquisition and data analysis in public affairs.

UAPP 691 Processes of Social Inquiry 3
Explores the philosophical underpinnings of social inquiry and the issues surrounding the development and use of social research for urban and policy analysis.

UAPP 692 Seminar: Political Science 3
See POSC 692 for course description.

UAPP 693 Program Evaluation 3
Survey of theory and methods for the evaluation of human service programs. When possible, students participate in actual evaluative research.

UAPP 694 Survey Research 3
Methods and procedures for the design, administration and analysis of sample surveys.

UAPP 695 Political Economy of the Environment 3
Examines a wide range of theories on the social, political and economic meanings and values attributed to nature. Particular attention is paid to differences in perspective on the relation of human beings to the environment. Protection, wise use and preservation policy goals are critically evaluated and issues of environmental justice are considered. May be cross-listed with MAST 695 and/or POSC 689.

UAPP 696 Public Management Statistics 3
Emphasis on the practical knowledge of statistical techniques and their use in the management of data (or data systems) in the public sector. Discussion and appraisal of various statistical tools from a theoretical standpoint, and application of statistical methods and procedures in a laboratory situation for the collection, organization and analysis of statistical information in public management research. May be cross-listed with POSC 695.

UAPP 697 Advanced Social Statistics 3
See POSC 696 for course description.

UAPP 698 Public Investment Policy 3
Focuses on the means by which government activities can be financed. Topics are tax versus debt financing; use of appropriate instruments and policies, e.g., types of bonds; and forces that influence implementation, e.g., the design of instruments, fiscal capacity, rating system and market behavior. May be cross-listed with POSC 698.

UAPP 699 Environmental Policy and Administration 3
See POSC 698 for course description.

UAPP 700 Management Decision Making 3
Focuses on analytical decision making within public organizations. Examines processes by which decisions can be made and evaluated. Emphasis on conceptual factors that provide a guide to decisions and evaluations of decision methodologies, e.g., systems analysis, cost-benefit analysis, PERT/critical path method, decision tree and time series. May be cross-listed with POSC 699.

UAPP 701 Proseminar: Technology, Environment and Society 3
Examines institutional, political and economic factors influencing the role of technology in urban society. Discusses public policies directly and indirectly related to technology development, diffusion and control. Presents a wide range of theoretical and policy perspectives, including sociology, political science, economics, urban planning, environmental studies, and history and philosophy of technology. May be cross-listed with POSC 699.

UAPP 702 Proseminar in Governance, Planning and Management 3
Deals with policy and research issues concerning the making, administering and outcomes of public policies affecting urban populations and with how urban governance, planning and management processes are influenced by the interaction of the public, private and third sectors at the local, national and international scales.
UAPP 823 PROSEMINAR: SOCIAL AND URBAN POLICY 3
Social policy attempts to promote the well-being of individuals, families and communities through public action. Explores efforts to address social and economic problems in urban society. Considers differential policy impacts by social class, race/ethnicity, gender and age. Topics: welfare, social security, health, education, criminal justice and employment. May be cross-listed with EDUC825 and ISTD823.

UAPP 825 COMPARATIVE PUBLIC ADMINISTRATION 3
See POSC825 for course description.

UAPP 826 MULTIVARIATE STATISTICAL ANALYSIS 3
Provides an in-depth understanding of advanced statistical methods with an applied focus on estimation, inferences, and prediction of models. Major topics are: multiple regression, functional forms, types of data, regression diagnostics (collinearity, serial correlation, heteroscedasticity, and simultaneity), different estimators, comparison of models, dummy dependent variables, dynamic models and lags, and multiquation models. PREREQ: UAPP815
RESTRICTIONS: A statistics course that introduces regression analysis.

UAPP 827 PROGRAM AND PROJECT ANALYSIS 3
Explores how public sector decision makers evaluate feasibility of government programs and projects. Governmental and societal costs incurred and benefits that would result if public programs are adopted, are discussed. Issues in urban areas. Considers how issues of time, program design, urban activities and structures, and potential effectiveness should be handled. Considers the equity of government programs and their potential impact in the future.

UAPP 828 URBAN ANALYSIS AND POLICY ALTERNATIVES 3
Explores a variety of theories of the city and their ability to explain the contemporary conditions and problems of cities. Critically examines the role of analysis in the formation of urban policy.

UAPP 829 ADVANCED PUBLIC FINANCE 3
Advanced course in theory and application of financing, spending, and regulatory policy instruments of state and local governments. Topics include efficiency, equity and impacts of different types of taxation, user charges, expenditure approaches (transfers/subsidies), and regulation alternatives. May be cross-listed with POSC829.

UAPP 833 PUBLIC FINANCE AND FISCAL MANAGEMENT 3
The theory and practice of public finance and public sector economics as they relate to the financial management of state and local governments in the context of a federal system. General topics include revenues, expenditures, intergovernmental fiscal relationships and selected techniques of public resource management such as budgeting and debt management. May be cross-listed with POSC839.
PREREQ: UAPP834

UAPP 834 PUBLIC ECONOMICS 3
Develops the framework and concepts of microeconomics for the purpose of applying them to the analysis of urban and public sector policies and issues from such topical areas as education, transportation, housing, energy, and public health, community development, law enforcement, recreation and regulation.

UAPP 835 ORGANIZATION THEORY AND ADMINISTRATION 3
See POSC835 for course description.

UAPP 837 PUBLIC SECTOR HUMAN RESOURCES MANAGEMENT 3
Personal management topics of importance to the manager in the public agency setting: public employee labor relations, grievance and dispute settlement, merit systems, pay and classification systems, affirmative action, modern selection techniques, and the role of the personnel specialist in designing and implementing employee and organizational development programs. May be cross-listed with POSC837.

UAPP 838 PUBLIC POLICY ANALYSIS 3
See POSC838 for course description.

UAPP 840 INTRODUCTION TO THE NONPROFIT SECTOR 3
Traces history and development of the nonprofit sector in the United States, with a focus on social, economic, political and legal factors. Voluntarism and philanthropy are emphasized. The role of nonprofit organizations in furthering the goals of community development is explored.

UAPP 841 MANAGEMENT AND GOVERNANCE OF NONPROFIT ORGANIZATIONS 3
Provides an introduction to the leadership and management issues facing nonprofit executives and governing boards. Topics include board relationships and voluntary leadership, financial management and budgeting, human resource management, organizational marketing and strategic planning, record management, and the use of information technology in management and governance.

UAPP 842 STRATEGIC PLANNING FOR NONPROFIT ORGANIZATIONS 3
Provides students with the skills and knowledge required for carrying out strategic planning in private nonprofit and public agencies. Focuses on the organizational environments in which planning takes place, examines the theories which underlie planning in general and specific planning in particular and presents a usable model for strategic planning.

UAPP 860 INTERNSHIP SEMINAR 1
Assists student in making decisions about specialization and internship objectives related to the Masters in Public Administration program and identifies related skills. Develops short- and long-term career skills.

UAPP 863 DOCTORAL RESEARCH PAPER 3
Requirement of the doctoral program, the doctoral research paper is prepared prior to the dissertation proposal.
RESTRICTIONS: Ph.D. students only.

UAPP 864 INTERNSHIP FIELDWORK 2
Three-month (or equivalent) fieldwork completed along with seminars, performance evaluation, and career reflection paper.

UAPP 868 RESEARCH 1-6

UAPP 869 MASTER'S THESIS 1-6

UAPP 870 READINGS 1-6

UAPP 872 ANALYTICAL PAPER 3-6
A requirement of the M.A. and M.P.A. program. The paper demonstrates the student's ability to analyze a particular policy or administrative problem and develop an appropriate response.

UAPP 896 PRE-CANDIDACY STUDY 3-12 PF
Research and readings in preparation of dissertation topic and/or qualifying examinations for doctoral students before admission to candidacy but after completion of all required coursework.
RESTRICTIONS: Not open to students who have been admitted to candidacy.

UAPP 896 DOCTORAL DISSERTATION 1-12 PF

UNIVERSITY COURSE

UNIV 120 UNIVERSITY FORUM 1 PF
Course taught in conjunction with the University Forum lecture series. Students attend all Forum lectures (approximately ten), read selected texts and/or journal essays designed to supplement the lecture series, and take a final exam.

UNIV 320 CONTEMPORARY ISSUES FOR RESIDENT ASSISTANTS 1
Introduces new Residents Assistants to issues affecting college students. All topics covered in the course focus on the needs of the new resident assistant in the Office of Housing and Residence Life.
RESTRICTIONS: Must be a resident assistant.

UNIV 350 DEL CENTRAL YEAR ABROAD 0 NR

UNIV 350 NATIONAL STUDENT EXCHANGE PROGRAM 0 NR

UNIV 351 SEMESTER IN COPENHAGEN 0 NR

UNIV 354 SEMESTER IN LONDON 0 NR

UNIV 368 HONORS WORKSHOP: ADVANCED TOPICS 1
Multidisciplinary seminar with emphasis on discussion of state-of-the-art research topics by Accounting/Business/Economics faculty. New topic each semester. Includes assessment of the research approach, substantive findings, related research and possible extensions.
PREREQ: BUAD301 and BUAD311
RESTRICTIONS: Requires GPA of 3.0 or higher and Junior or Senior status.

UNIV 369 HONORS: UNDERGRADUATE RESEARCH SUSTAINING 0 PF
Research apprenticeship with faculty mentor.
RESTRICTIONS: Limited to those appointed as Undergraduate Research Scholars in the Undergraduate Research Program. Must have approval of the Coordinator of Undergraduate Research, University Honors Program.

UNIV 401 SENIOR THESIS 2-4
Senior thesis for students working toward a degree with distinction.
RESTRICTIONS: Total credit for UNIV401 and UNIV402 not to exceed 6.

UNIV 402 SENIOR THESIS 2-4
Continuation of UNIV401.
RESTRICTIONS: Total credit for UNIV401 and UNIV402 not to exceed 6.

UNIV 490 HONORS TUTORIAL: HUMANITIES 3
Designated faculty direct the studies of up to three students per semester. Readings of classical works in the humanities described. Group as well as individual discussions.
RESTRICTIONS: Requires 3.4 GPA, Sophomore standing or above, and permission of the Honors Program.
WOMEN'S STUDIES

WOMS 201 INTRODUCTION TO WOMEN'S STUDIES 3
Study of the causes and conditions determining women's status in society, as evidenced in institutional structures and personal relations between men and women. Taught from multidisciplinary perspectives.

WOMS 202 INTRODUCTION TO INTERNATIONAL WOMEN'S STUDIES 3
Examines how public policies and traditional customs affect women's lives around the world. Focuses on the effects of political and economic status, social norms and institutional structures on women's conditions in family life, education and employment.

WOMS 203 CONTEMPORARY MORAL PROBLEMS 3
See PHIL202 for course description.

WOMS 205 WOMEN IN THE ARTS AND HUMANITIES 3
Interdisciplinary survey of women's contributions to the arts and humanities, also including literary/arthistic images of women, contributions of minority and non-Western women, and study of the relationship between women's social-economic roles and cultural expressions.

WOMS 206 WOMEN AND WORK 3
Covers a variety of topics including women in traditional and non-traditional occupations, gender-based discrimination (wage inequities, sexual harassment, exclusionary policies), the contributions of women to the economy and the role of law in shaping conditions for women in the workplace. May be cross-listed with SOC206.

WOMS 207 WOMEN, POWER AND SUCCESS 3
Research, theory and possible strategies related to expanding the horizons in achieving "power" and "success" in women's lives. Topics include socializing girls to be successful, evaluating personal strengths and goals, and a new model of women and power.

WOMS 210 WOMEN AND RELIGION 3
Examines the impact of Near Eastern and Judeo-Christian scriptures on women in the family and society, especially focusing on women's roles as mystics and leaders within and outside of institutional religion. Also covers recent feminist approaches to religion. May be cross-listed with PHIL210.

WOMS 211 MEN, CONFLICT AND SOCIAL CHANGE 3
Examination of male roles and images in society, utilizing an interdisciplinary social science perspective. Topics include the family, work, military, violence and the implications of feminism for men's issue-oriented role. May be cross-listed with SOC211.

WOMS 212 MOTHERHOOD IN CULTURE AND POLITICS 3
Examines contemporary cultural and political issues related to motherhood and mothering experience, including definitions and cultural significance of motherhood, experiences of childbirth, effects of new reproductive technologies, surrogate mothering and "maternal thinking," also, efforts to avoid motherhood through contraception and abortion and related legal controversies.

WOMS 213 MEN AND WOMEN IN AMERICAN SOCIETY 3
See SOC213 for course description.

WOMS 216 INTRODUCTION TO FEMINIST THEORY 3
See PHIL216 for course description.

WOMS 222 LANGUAGE AND GENDER 3
See UNCG222 for course description.

WOMS 230 WOMEN, BIOLOGY AND MEDICINE 3
Considers societal theories and medical practices concerning women and discusses their biological basis, their biological effects, sources of information with which to evaluate them, etc. Emphasis on preparing the student to make own medical and obstetrical decisions and to critically evaluate claims concerning male/female differences. May be cross-listed with CSCC233.

WOMS 240 WOMEN AND VIOLENCE 3
Analyzes a variety of issues and topics relating to women and violence, including rape, domestic violence, images of women in popular culture, incest and child abuse, pornography, sexual harassment and women who use violence. Presents descriptive materials, sociological analysis and strategies for change.

WOMS 242 WOMEN AS IMAGE AND IMAGEMAKER 3
See ART242 for course description.

WOMS 291 WOMEN'S HISTORY THROUGH FILM 1
Explores women's historical experiences through the medium of film. Students will view and discuss a variety of documentary films on women and read materials related to topics covered in the films. Films will deal with historical and contemporary issues in the United States and internationally. May be cross-listed with HIST291.

WOMS 293 HONORS SHORT COURSE 1

WOMS 298 RESEARCH ON RACE, ETHNICITY AND CULTURE 3
PF Lecture series in which faculty and guest speakers discuss their research on contemporary and historical perspectives on race, ethnicity and culture. Research presented from several disciplines, including sociology, history, literature, anthropology and psychology, among others. May be cross-listed with AMS298.

WOMS 299 RESEARCH ON WOMEN 3
PF Interdisciplinary lectures in which faculty, staff and advanced students share results of their research on women. Lectures cover issues in anthropology, sociology, political theory, psychology, philosophy, literature, history, theology, ethnic studies, music, art, math education, health, etc.

WOMS 300 WOMEN IN AMERICAN HISTORY 3
See HIST300 for course description.

WOMS 302 WOMEN IN MUSIC: AN ALTERNATE SURVEY 3
See MUSC302 for course description.

WOMS 305 THE EVOLUTION OF HUMAN SEX ROLES AND REPRODUCTION 3
See ANT305 for course description.

WOMS 320 VARYING AUTHORS AND GENRES 3
See FLLT320 for course description.

WOMS 322 TOPICS: CLASSICAL LITERATURE IN TRANSLATION 3
See FLLT322 for course description.

WOMS 323 INTRODUCTION TO WOMEN AND POLITICS 3
See POSC323 for course description.

WOMS 325 TOPICS: GERMAN LITERATURE IN TRANSLATION 3
See FLIT325 for course description.

WOMS 326 TOPICS: HISPANIC LITERATURE IN TRANSLATION 3
See FLIT326 for course description.

WOMS 328 TOPICS: JAPANESE LITERATURE IN TRANSLATION 3
See FLIT328 for course description.

WOMS 329 TOPICS: ITALIAN LITERATURE IN TRANSLATION 3
See FLIT329 for course description.

WOMS 330 VARYING AUTHORS, THEMES AND MOVEMENTS 3
See FLIT330 for course description.

WOMS 333 PSYCHOLOGY OF WOMEN 3
See PSYC333 for course description.

WOMS 350 WOMEN AND CRIMINAL JUSTICE 3
See CRJU350 for course description.

WOMS 353 TWENTIETH CENTURY BRITISH LITERATURE 3
See ENGL353 for course description.

WOMS 363 WOMEN IN CROSS-CULTURAL PERSPECTIVE 3
Social realities of women within the cultures of Asia, Africa and Latin American societies. How institutions such as motherhood, the family, sexuality and work structure women's lives within the dominant social ideologies. May be cross-listed with ANTH363.

WOMS 366 INDEPENDENT STUDY 1-6

WOMS 375 TOPICS: RUSSIAN AND SOVIET CULTURE IN TRANSLATION 3
See FLIT375 for course description.
WOMS 380 Women Writers  3
See ENGL380 for course description

WOMS 381 Women in Literature  3
See ENGL381 for course description

WOMS 382 Studies in Multicultural Literature in English  3
See ENGL382 for course description

WOMS 389 Topics: Women and Health Issues  3
Varying special topics related to women's health. Topics may include, but are not limited to: the relationship between women, health and development; theoretical contributions of feminism to thinking about relationship between gender and health; women's health conditions in various parts of the world. May be cross-listed with CSCC389 and/or PHIL389
RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 390 Honors Colloquium  3
See ARSC390 for description. May be cross-listed with ANTH390, IFST390 and/or PHIL390.

WOMS 392 Honors Colloquium  3
See PHIL392 for course description.

WOMS 401 Foundations of Human Sexuality  3
See IFST401 for course description

WOMS 407 Sociology of Sex and Gender  3
See SOCI407 for course description
RESTRICTIONS: See SOCI407 for restrictions.

WOMS 410 Critical Issues in Feminist Scholarship  3
Senior majors and minors. Requires approval of Women's Studies advisor and course instructor. Students desiring to combine project work and an internship must also register for WOMS 498.

WOMS 413 Problems in American Government  3
See POSC413 for course description

WOMS 415 Race, Class and Gender  3
See SOCI415 for course description

WOMS 430 Teaching Family Life  3
See IFST430 for course description

WOMS 436 Politics and Literature  3
See POSC436 for course description.

WOMS 439 Women and Revolution in Africa  3
See HIST439 for course description

WOMS 440 Topics in Interpersonal and Organizational Communication  3
See COMM440 for course description

WOMS 442 Topics in Organizational Communication  3
See COMM442 for course description

WOMS 460 Women in International Development  3
See SOCI460 for course description

WOMS 465 Studies in Literature Genres, Types and Movements  3
See ENGL465 for course description.

WOMS 466 Independent Study  1-6

WOMS 471 Advanced Philosophical Topics  3
See PHIL470 for course description.

WOMS 472 Seminar in Medieval History  3
See HIST471 for course description.

WOMS 475 Topics  1-4
Cross-listed on a term basis with courses in other areas of instruction. Course title, description, credit hours and grade type same as cross-listed course. May be repeated for credit when courses cross-listed with it are different.

WOMS 480 Seminar  3
See ENGL480 for course description.

WOMS 484 Women in Sports  3
See HESC484 for course description.

WOMS 498 Internship in Women's Studies  3
Students work eight hours per week in an agency or program catering to women's issues. Academic knowledge applied to actual working situations. Seminar discussions focus on internship experience in light of academic research and theory.
RESTRICTIONS: Requires permission of instructor.

WOMS 610 Critical Issues in Feminist Scholarship  3
Provides a survey introduction to women's studies for graduate students.