

LING 804 Linguistic Principles of Translation 3

Translation as linguistic science rather than literary art. Contrastive analysis, stylistics and lexical problems such as neologisms and matching of levels of speech. Supervised work in translation of texts of various types. Relating conceptual construction of various linguistic theories (tagmemics, systemic linguistics, transformational-generative grammar, meaning-text model theory) to the realities of language translation.

LING 805 Discourse in Foreign Languages 3

Data taken from several languages and submitted to an analytical procedure that addresses tactical and interactional aspects as well as grammatical ones. Discussion of the pedagogical implications of this type of discourse analysis.

LING 806 Interference and Interlanguage 3

Study of the principles of contrastive analysis, error analysis and interlanguage theory as they apply to second-language learning. Topics include transfer, markedness theory and universals, fossilization, learning and production strategies. Special emphasis on data analysis.

LING 807 The Structure of Japanese 3

Formal analysis of the phonology, morphology and syntax of contemporary Japanese. Reading and discussion of theoretical analysis of Japanese syntax.

LING 808 Lexicography and Lexicology 3

Seminar course in linguistic principles in the compilation of dictionaries. Theoretical contributions of different schools of linguistics to problems of lexicography and the contribution of working lexicographers to linguistic data. The relationship of lexicography to translation. A linguistic evaluation of lexicographical theory.

LING 820 Advanced Studies in Methodology 3

Discussion of current issues in second language acquisition and their impact on classroom methods. Design of experimental research on ESL/FL classroom activities. Formulation of principles for second language instruction.

LING 824 Seminar in Second Language Testing 3

Analysis of major issues in second language testing, including latent trait measurement, problems of ascertaining validity and calibrating items and interactive testing. Special emphasis on current research in oral/reading proficiency testing, the testing of small group work and on the introspective vs. the interactive testing research methods.

PREREQ: LING 624.

LING 830 Syntax III 3

In-depth investigation of syntactic universals and recent developments in the theory of syntax.

PREREQ: LING 610.

LING 831 Topics in Syntax 3

Current topics in syntactic theory, problems in the syntactic analysis of specific languages.

PREREQ: LING 830.

RESTRICTIONS: May be repeated for credit when topics vary.

LING 848 Seminar in Language Development 3

See EDST 848 for course description.

LING 850 Linguistics and Writing 3

Survey of writing systems. Problems of text structure.

LING 861 Topics in Phonology 3

Detailed examination of one or more current (controversial) issues in phonological theory.

PREREQ: LING 608.

LING 880 Second Language Acquisition 3

A detailed analysis of current issues in second language acquisition based on extensive readings of research findings. Topics include monitor model, pidginization process, natural versus formal second language acquisition, and adult-versus-child acquisition.

LING 881 Soviet Psycholinguistics I 3

Study of the theories of Vygotsky, Luria, Leont'ev and others. Basic concepts in Soviet theory: activity, zone of proximal development and regulation.

LING 882 Soviet Psycholinguistics II 3

Advanced problems in Soviet theory of language learning. Non-Soviet extensions of the theory. Application of theory to second-language acquisition.

PREREQ: LING 881.

LING 890 Studies in Linguistics 3

Varying topics in linguistics, such as grammatical theory, grammatical analysis, syntax, historical-comparative linguistics, stylistics and grammar testing. May be cross-listed with ENGL 890.

LING 969 Doctoral Dissertation 1-12 PF

Liberal Studies

MALS 600 Nature and Human Nature 3

Concentrates on salient views of nature and human nature, and the ways in which they have been shaped by the historical circumstances and disciplinary perspectives from which they were developed.

RESTRICTIONS: Open to MALS majors only.

MALS 603 The American Frontier: Fact and Fiction 3

Uses novels, films and more traditional sources of information to examine the role of the frontier in shaping American attitudes and values.

RESTRICTIONS: Open to MALS majors only.

MALS 605 China and the West 3

Survey of historical and cultural contacts between China and the West before the 19th century. Presents, among other topics, the old silk road, medieval Christian missions to China, Marco Polo, the Jesuits in Peking, introduction of Western learning into China and the Chinese vogue in the West during the 17th and 18th centuries.

RESTRICTIONS: Open to MALS majors only.

MALS 610 Force, Conflict and Change 3

From antiquity to the present, the use of force and the resolution of conflict have been among humanity's enduring preoccupations. Examines ideas about these issues, and associated questions such as the meaning of "heroism" and "just war."

RESTRICTIONS: Open to MALS majors only.

MALS 612 Moral Character: Values, Virtues, Responsibilities 3

Tests the hypothesis that lives are more meaningful in direct proportion to developed moral character. Addresses "What is a worthy life?" by exploring such concepts as self-knowledge, integrity, autonomy, courage, justice, work, love and community. Readings from philosophers and developmental psychologists.

RESTRICTIONS: Open to MALS majors only.

MALS 614 The French Revolution: Ideas, Interpretations and Dissent 3

Examines ways in which the French Revolution of 1789-1815, with all its complex events and movements, has been perceived and conceptualized by contemporaries, commentators and professional scholars. In-depth study of its literature to see how human beings invented concepts and interpretations to make sense of the French Revolution.

RESTRICTIONS: Open to MALS majors only.

MALS 618 Studies in the History of Art 3

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 MALS majors only.

MALS 647 Philosophy of Technology 3

See PHIL 647 for course description.

Materials Science

MASC 302 Materials Science for Engineers 4

Crystal binding and structure; energetics and structure of lattice defects; elasticity, plasticity, and fracture; phase equilibria and transformations; relations of structure and treatment to properties; structures of inorganic and organic polymers; and electronic and magnetic properties.

MASC 406 Corrosion and Protection 3

How structural materials degrade by interaction with their environments. High-temperature oxidation and sulfidation of alloys. Electrochemical attack on alloys by electrolytes in relation to metallurgical structure. Stress corrosion cracking. Aggressive environments. Testing and control methods.

PREREQ: Physical chemistry.

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 CHEG 601.

PREREQ: MASC 302.

MASC 602 Structure of Materials 3

Fundamentals of crystallography. Crystal structure analysis by X-ray and electron diffraction. Characterization of materials by optical microscopy, scanning and transmission electron microscopy. Simplified approach to image theory and diffraction theory.

PREREQ: MASC 302.

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: MASC 302 and MASC 602.

COREQ: MASC 602.

MASC 604 Phase Transformations 3

Introduction to thermodynamic functions: enthalpy, entropy and free energy. Fick's first and second laws of diffusion. Liquid/solid and solid/solid phase equilibria and transformations. Nucleation and growth. Massive and martensitic transformations. Phase transformations in polymers, ceramics and electronic materials.

PREREQ: MASC 302.

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 MEEG 614.

PREREQ: MASC 302.

RESTRICTIONS: Graduate standing acceptable in lieu of Prerequisite.

MASC 615 Mechanical Properties of Materials 3

Stress, strain, tensor notation and elementary elasticity. Plasticity and ductility based upon continuum mechanics. Ideal strength of crystalline, polymer and amorphous materials. Real materials: amorphous, polymers, ceramics, metals and composites. Dislocations, strengthening of solids. Mechanisms of fracture, fracture mechanics, fatigue, creep and stress rupture. May be cross-listed with MEEG 615.

RESTRICTIONS: Requires graduate status.

MASC 616 Chemistry and Physics of Surfaces and Interfaces 3

See CHEG 616 for course description.

MASC 623 Electrical Properties of Matter I 3

See ELEG 623 for course description.

MASC 624 Carrier Transport in Solids 3

Quasi-equilibrium behavior of carriers in homogeneous semiconductors; relaxation, trapping and scattering mechanisms; and regimes of transport. Generation and recombination of excess carriers; equations of continuity and their solutions; and high-field effects. Metal-semiconductor contacts; symmetric and asymmetric semiconductor homojunctions; and heterojunctions.

PREREQ: ELEG 623.

MASC 801 Structure of Solids I 3

Atomic and molecular structure of solids: electron states and atomic bonding, molecular structure, spectroscopies to study binding, crystallography, typical crystal structures, diffraction of waves by matter, reciprocal space and the interpretation of diffraction information.

PREREQ: MASC 302.

MASC 802 Structure of Solids II 3

Microstructure of solids. Defects, interfaces and domains. Structure-property relations. Microscopies and other methods to study microstructural detail. Development and characteristics of typical microstructures.

PREREQ: MASC 302.

MASC 803 Equilibria in Material Systems 3

Classical thermodynamics of condensed systems (macroscopic description). Fundamental laws. Functions and equations of state. Equilibrium and stability criteria. Single component phase equilibrium, multi-component mixtures. Partial-molar properties, non-ideal mixtures. Equilibrium in multi-phase, multi-component systems. Phase Rule.

PREREQ: MASC 302.

MASC 804 Kinetics in Material Systems 3

Theory of reaction kinetics. Transport mechanisms in solids. Nucleation and spinodal decomposition. Interfacial attachment and migration. Transition state theory applied to diffusion and phase transformation. Elementary non-equilibrium thermodynamics and phenomenological equations in material transport and phase transformation.

PREREQ: MASC 302.

MASC 805 Field Concepts in Mechanics and Materials 3

Introduction to field methods applicable to continuum mechanics, solid state physics, electromagnetic theory, etc. Coverage of classical mechanics, transition to continuous systems, elastic, acoustic and electromagnetic fields. Emphasis on applications to mechanics and materials science.

MASC 806 Physical Properties of Solids 3

Bonding, structure and growth of crystalline solids, glasses and superlattices. Phonons. Energy bands and band gaps. Photons and photonic properties of solids. Defects in solids and their effects on electrical and optical properties. Carrier generation, transport and recombination. Solids in magnetic fields.

MASC 811 Advanced Topics in Materials 1-3

Discussion of a topic of current interest in the science or engineering of materials.

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 822 Imperfections in Crystals 3

Elasticity, point defects, dislocations, planar defects, stress fields of imperfections. Interactions between lattice defects. Effects of point, line and surface defects on mechanical properties of crystals.

MASC 823 Transmission Electron Microscopy in Materials Science 3

Transmission electron microscope, lens defects, resolution. Diffraction and Kikuchi pattern formation and analysis. Image formation: kinematical and dynamical theories of electron diffraction. Burgers' vector and other fault analysis. Convergent beam and microdiffraction techniques. High resolution electron microscopy.

MASC 824 Advanced Carrier Transport in Solids 3

Selected topics of advanced electronic properties of semiconductors, electronic structure of bands and defects, anisotropy, semiconducting glasses, photon and phonon-induced transitions, quasi-particles, defect spectroscopy, advanced scattering of electrons, phonons, photons, multi-particle theory, nonlinear effects, high-field effects, photoconductivity and luminescence. Recent developments.

MASC 868 Research 1-9**MASC 869 Master's Thesis 1-6****MASC 969 Doctoral Dissertation 1-12 PF**

Marine Studies**MAST 200 Concepts in Oceanography 3**

Introduction to the scientific study of oceanography. Exploration of the multi-disciplinary nature of applying fundamental physics, chemistry, biology, geology, meteorology and mathematics to understanding the world ocean. Combined lectures with extensive video presentations illustrate field and laboratory research in oceanography.

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 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 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 618 Marine Microbiology 3

Studies physiology and molecular biology of marine microorganisms, with emphasis on bacteria. Examines interaction among microorganisms and with higher organisms and introduces the roles of microorganisms in biogeochemical cycles in marine ecosystems.

RESTRICTIONS: Requires permission of instructor.

MAST 623 Physiology of Marine Animals 3

Processes and mechanisms of adaptation of animals to marine environments. Examines how environmental factors affect physiological processes in marine animals. Lectures address and integrate physiological processes at cellular, whole organism and habitat levels.

RESTRICTIONS: Requires permission of instructor.

MAST 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.

MAST 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.

MAST 627 Marine Biology 4

Ecologically oriented study of elementary oceanography, adaptive physiology, aspects of population and community ecology, reproductive 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, Invertebrate Biology, Genetics, and Physiology.

RESTRICTIONS: Requires permission of instructor.

MAST 629 Topics in Marine Ecology 1-3

Selected topics in marine ecology and physiology. Topics may vary and will be announced in the registration booklets.

RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

MAST 631 Marine Geology 3

See GEOL 631 for course description.

MAST 632 Genetics of Marine Organisms 3

Quantitative and theoretical discussion of population and evolutionary genetic principles, using marine organisms as examples and focusing on marine environments. Covers both text and recent primary literature.

PREREQ: BISC 303.

MAST 633 Image Processing 3

See ELEG 633 for course description.

MAST 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.

MAST 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.

MAST 639 Public Policy Issues and Administrative Law 3

See URAF 639 for course description.

MAST 640 Opto-electronics 3

See ELEG 640 for course description.

MAST 645 General Oceanography 3

Introduction to the science of oceanography, emphasizing the physical and natural sciences nature of the subject matter and application to social schemes.

RESTRICTIONS: Offered off campus, for public school teachers and general public.

MAST 646 Chemical Oceanography 3

Composition of seawater; physiochemical properties of seawater distributions of gases, nutrients and trace metals; and effect of biological processes on seawater composition.

PREREQ: CHEM 103 and CHEM 104.

MAST 650 Clay Mineralogy 3

Crystallography, 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, thixotropic behavior, etc. May be cross-listed with GEOL 650 and/or PLSC 650.

MAST 670 Introduction to Marine Policy 3

Provides an overview of conceptual approaches and analytical tools used in the field as well as an overview of major substantive areas of marine policy. Covers (mainly in a U.S. context) fisheries management, marine minerals exploitation, coastal management, marine transportation and naval power.

MAST 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.

MAST 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 ECON 670.

PREREQ: ECON 401.

MAST 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 POSC 604.

RESTRICTIONS: Requires permission of instructor.

MAST 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 controls of water pollution.

RESTRICTIONS: Requires permission of instructor.

MAST 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 ECON 675.

RESTRICTIONS: Requires permission of instructor.

MAST 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 ECON 676.

PREREQ: ECON 401.

MAST 677 Ocean Law and Policy 3

Focuses on understanding the strengths and weaknesses of the legal framework which governs ocean resources and ocean space beyond the limits of national jurisdiction. Evaluates international conventions which pertain to the ocean as to impact and effectiveness.

MAST 679 Shipping and Port Policies 3

A seminar to study the structure and management of the shipping industry and ports, policies for ocean commerce and international trade. May be cross-listed with POSC 679.

RESTRICTIONS: Requires permission of instructor.

MAST 680 Introduction to Applied Ocean Science 3

Basic quantitative and empirical description of the behavior of solids, fluids, soils and engineering materials. Corrosion, environmentally induced forces. Development, design, construction and operation of marine structures, transportation energy and aquatic production systems. Role of remote sensing.

RESTRICTIONS: Requires permission of instructor. Not open to applied ocean science or engineering majors.

MAST 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 ELEG 681 and/or GEOG 681.

RESTRICTIONS: Requires permission of instructor.

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.

PREREQ: CHEM 101.

RESTRICTIONS: For students with little or no background in material science. Not for credit for students that passed MASC 302.

MAST 684 Particles in the Aqueous System 3

Deals with all aspects of particle flocculation that occur within the bounds of the natural environment. Brings together from a number of fields (physics, engineering, chemistry and biochemistry) the theories, equations and principles that bear on the natural aqueous environment.

RESTRICTIONS: Requires permission of instructor.

MAST 685 Underwater Acoustics 3

Principles of underwater acoustics, including history and basic concepts; the sonar equations; propagation of sound in the sea; reflection and scattering; sonar background noise; detection of signals in noise; sonar systems; system requirements and operations; and signal processing and display.

MAST 686 Remote Sensing Seminar 1

Basic and applied research topics in remote sensing of earth resources, coastal processes, estuarine 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.

RESTRICTIONS: May be repeated for credit when topics vary.

MAST 687 Colloidal Science Seminar 1

Basic scientific and applied research topics in colloidal science presented by University students, faculty and guest speakers. Stresses the processes related to fine particles in the marine environment.

RESTRICTIONS: May be repeated for credit when topics vary.

MAST 689 Radar Basics and Applications 3

Principles of microwave remote sensing, including electromagnetic wave propagation; microwave radiometry; microwave interaction with water, land and the atmosphere; mechanisms and models for scattering and emission; application of radar to studies of land and the oceans, including ocean waves, currents and surface winds.

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.

RESTRICTIONS: Requires permission of instructor.

MAST 801 Current Problems in Physical Oceanography 1

Student presentation and evaluation of contemporary research papers in physical oceanography. Topics vary each semester and will be announced in the registration booklet.

RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

MAST 804 Air-Sea Interaction I 3

Atmospheric surface layer above and aqueous boundary layer below the air-sea interface; and laboratory.

RESTRICTIONS: Requires permission of instructor.

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.

PREREQ: MEEG 863 and MEEG 864.

MAST 807 Geophysical Fluid Dynamics II 3

Investigation of fundamental topics in the dynamics of waves and circulation in dynamical physical oceanography and meteorology. Wind-driven ocean circulation, quasigeostrophic motion of a stratified fluid, and instabilities.

PREREQ: MAST 806.

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.

PREREQ: MAST 602.

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.

PREREQ: MAST 602.

MAST 810 Numerical Ocean Modeling 3

Application and analysis of numerical techniques for simulating time-dependent fluid flow in two and three dimensions with specific application to large-scale ocean flows. Covers finite-difference, finite-element and spectral techniques. Computer implementation of at least one example problem.

PREREQ: MAST 807 and MATH 610.

RESTRICTIONS: Requires proficiency in FORTRAN, C or Pascal.

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.

RESTRICTIONS: Requires permission of instructor.

MAST 816 Biological Oceanographic Process 1-4

Multidisciplinary approach to the abundance and distribution of organisms in the oceans, 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.

PREREQ: General Biology, Ecology, Microbiology, and Invertebrate Biology

RESTRICTIONS: May be repeated for credit when topics vary

MAST 820 Experimental Design Seminar 1

Forum for presentation of research plans or results with emphasis on experimental design and data analysis. Ensuing discussion aids preparation of research proposals and sharpens critical assessment of own and colleagues' work.

MAST 821 Marine Biology Seminar 1

With each offering, addresses a different specific topic, e.g., tropical marine biology, larval dispersal, estuarine productivity, etc.

RESTRICTIONS: May be repeated for credit when topics vary.

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; mathematical descriptions of growth, photosynthesis and nutrient uptake; mechanisms of physiological adaption to environmental variables; and structural and biochemical bases of phytoplankton taxonomy and biogeography.

PREREQ: MAST 624.

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.

RESTRICTIONS: Requires permission of instructor. May be repeated for credit when topics vary.

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 technique.

PREREQ: Graduate course in biochemistry.

RESTRICTIONS: May be repeated for credit when topics vary.

MAST 831 Estuarine and Shelf 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.

PREREQ: MAST 631 and GEOL 631.

MAST 845 Physical Chemistry of Seawater 3

Chemical equilibrium and kinetics are used to study the physical and inorganic chemistry of seawater. Topics are electrolyte theory, ion interactions among sea salts. Special topics are the carbonate buffer system, seawater reactions involving protons and electrons, and formation of ocean precipitates.

PREREQ: Aquatic Chemistry and Physical Chemistry.

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 electrochemical, spectroscopic, 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.

PREREQ: MAST 646 or analytical chemistry.

RESTRICTIONS: May be repeated for credit when topics vary.

MAST 848 Geochemical Oceanography 3

Chemical origin and formation of the ocean; chemistry of marine sediments; transfer of chemicals to and within the sea (weathering, global cycles); marine precipitates; chemical principles of marine geological reactions (solubility, redox); sediment diagenesis and pore water chemistry; and use of stable and radioisotopes in the oceans.

PREREQ: Aquatic Chemistry and Physical Chemistry.

MAST 849 Organic Chemical Oceanography 3

Covers descriptive 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.

MAST 850 Marine Inorganic Chemistry 3

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 655.

PREREQ: MAST 646, aquatic chemistry or physical chemistry.

MAST 853 Oceanography Seminar 1

A review of current oceanographic literature through student presentations.

RESTRICTIONS: May be repeated for credit when topics vary.

MAST 854 Marine Sedimentary Geochemistry 3

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: MAST 646.

MAST 856 Biogeochemical Oceanography 1-4

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.

MAST 868 Research 1-9**MAST 869 Master's Thesis 1-6****MAST 870 Advanced Marine Policy 3**

A continuation of MAST 670. Explains conceptual approaches and analytical tools in greater detail and applies them to specific marine policy issues in several nations. Compares and contrasts national ocean policies of a selected number of nations. Students evaluate and/or resolve a marine policy issue of their choice at a local, state, national or international level.

PREREQ: MAST 670.

MAST 871 Environmental Policy and Administration 3

See POSC 818 for course description.

MAST 873 Seminar: Marine Policy 1

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.

MAST 875 Advanced Fishery Economics 3

Theoretical and applied study of the optimal utilization and management of commercial and recreational fisheries with emphasis on equity issues and the difficulty of deriving regulations which are biologically effective and which provide incentives for economic efficiency at reasonable costs. May be cross-listed with ECON 875.

PREREQ: MAST 675 and ECON 675.

MAST 880 Principles of Applied Ocean Science 3

Principles of ocean energy conversion, remote sensing, materials and corrosion, soil mechanics, foundations, structures, intensive aquatic production, coastal erosion and sedimentation are studied in the context of creative interdisciplinary research and applied in the analysis of a single major marine problem or opportunity using a "case study" approach. Normally involves a practicum.

MAST 881 Satellite Oceanography 3

Fundamentals of remote sensing in oceanography, including space platforms, their orbits, instruments, data retrieval and image processing. Oceanographic applications of remote sensing, including visible, infrared and microwave techniques for sensing ocean color, temperature, salinity, currents and waves. Recent developments of remote sensing models for oceanic studies and new developments in data analysis.

RESTRICTIONS: Requires permission of instructor.

MAST 884 Biological Effects at Surfaces 3

Fundamentals of bioattachment for micro and macroorganisms. Conditioning films and holdfast mechanisms. Influence of chemical and electrical surface properties. Applications to marine fouling and its control, mariculture, degradation of heat transfer surfaces, dental plaque formation, biomedical implants and others.

RESTRICTIONS: Requires permission of instructor.

MAST 888 Hydrologic Optics 3

Terminology and relationships of hydrologic optics; scattering and absorption by suspended particles and dissolved substances in the water column; reflection and refraction of light at the sea surface; theory of radiative transfer in the sea; techniques for underwater light measurement; radiance and irradiance; color of the sea; and applications to biological physical oceanography.

MAST 969 Doctoral Dissertation 1-12 PF

Mathematics

MATH 010 Intermediate Algebra 3 R

Establishes, or reestablishes, the background of those who desire to take College Algebra. Experience indicates that many persons who need college mathematics are not able to proceed because of a deficient background.

MATH 012 Self-Paced Intermediate Algebra 1-3 R

Self-paced course designed to review algebra in order to prepare for college-level mathematics courses. Variable credit allows the student to proceed at his or her own pace.

RESTRICTIONS: Content same as MATH 010 when all three credits completed.

MATH 114 Elementary Mathematics and Statistics 3

Basic algebra with strong emphasis on graphing and relating geometric and algebraic concepts. Topics include exponential functions and logarithms, elementary trigonometry and statistics.

RESTRICTIONS: Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 115 Pre-Calculus 3

Develops concepts required for calculus around the unifying notions of a function and the graph of a function (polynomial, algebraic exponential, logarithmic, and trigonometric functions).

RESTRICTIONS: Familiarity with central concepts of algebra (factoring, solving equations, simplifying algebraic expression and laws of exponents) recommended. Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 170 Self-Paced Elementary Math and Statistics 1-3

Stresses algebra concepts and applications, elementary and trigonometric functions and topics in statistics. Variable credit allows the student to proceed at his/her own pace.

RESTRICTIONS: Content same as MATH 114 when all three credits completed. 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 1-3

Develops concepts required for calculus around the concept of a function and its graph. Polynomial, rational, exponential, logarithmic and trigonometric functions stressed. Variable credit allows the student to proceed at his/her own pace.

PREREQ: Intermediate Algebra.

RESTRICTIONS: Content is same as MATH 115 when all three credits completed. 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 2

Mastery-based algebra review followed by concepts required for MATH 221 developed around functions and their graphs (polynomial, rational, logarithmic and exponential).

RESTRICTIONS: Does not satisfy general skills math requirement. Only three credits from any combination of MATH 114, MATH 115, MATH 170, MATH 171 and MATH 172 can count toward graduation.

MATH 210 Discrete Mathematics I 3

Sets, counting, number systems and induction; vector geometry; matrices and matrix applications; and sequences. Emphasis on algorithmic concepts.

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.

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.

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.

MATH 242 Analytic Geometry and Calculus B 4

Exponential, log and trig functions; integration techniques; polar coordinates; and vectors.

PREREQ: MATH 241.

MATH 243 Analytic Geometry and Calculus C 4

Partial derivatives, multiple integrals, line integrals and series.

PREREQ: MATH 242.

MATH 251 Mathematics for the Elementary School I 3

Basic number concepts: numeration, whole numbers, integers, rational numbers, real numbers and arithmetic procedures.

MATH 252 Mathematics for the Elementary School II 3

Continuation of MATH 251.

PREREQ: MATH 251.

MATH 260 Basic Concepts of Analysis 3

The notion of limit, continuity, convergence, uniform continuity, least upper bound, greatest lower bound, compactness and connectedness.

PREREQ: MATH 243.

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 and MATH 115.

RESTRICTIONS: For liberal arts students not necessarily planning further study in mathematics.

MATH 302 Ordinary Differential Equations 3

Solutions of ordinary differential equations of first and second order; and applications, Laplace transforms, Fourier series and power series solutions.

PREREQ: MATH 243.

MATH 303 Differential Equations Computing Lab 1

Provides computing experience in differential equations.

COREQ: MATH 302.

MATH 315 Discrete Mathematics II 3

Termination, correctness and complexity of algorithms; algorithms for polynomials such as Euclidean algorithm and Horner's method. Numerical algorithms and convergence; recurrence relations and difference equations; and algorithmic graph theory.

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.

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.

MATH 349 Elements of Linear Systems 3

Elementary course in vectors and matrices with an orientation toward motivation and applications.

PREREQ: MATH 210 or MATH 230 or MATH 242.

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. Not for major (B.A. or B.S.) or minor credit in Mathematical Sciences.

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. Not for major (B.A. or B.S.) or minor credit in Mathematical Sciences.

MATH 381 Practicum in Secondary Mathematics 1

Teaching experience in a clinical setting, the Math Center. Helps develop an enquiring 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 uses of technology).

COREQ: MATH 243.

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: MATH 210.

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 CISC 410.

PREREQ: MATH 349 and CISC 106.

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 CISC 411.

PREREQ: MATH 426 or CISC 410.

MATH 450 Abstract Algebra 3-4

Topics for three credits are Integers (ordering, Euclidean algorithms and Chinese remainder theorem); Polynomials and Rings (Fundamental Theorem of Algebra, Gauss's Lemma and Lagrange Interpolation); and Fields (primitive elements, simple, extensions and discriminant). For four credits also include Groups (theorems of Lagrange, Cayley and Sylow).

PREREQ: MATH 349.

MATH 466 Independent Study 1-6

MATH 503 Advanced Calculus for Applications 3

Review, vectors, several-variable calculus, vector calculus and infinite series.

PREREQ: MATH 302.

MATH 508 Introduction to Complex Variables and Applications 3

Introduction to analytic functions, contour integration, power series, residues, conformal mapping and analytic continuation.

PREREQ: MATH 302.

MATH 514 Topics in Advanced Mathematics for Engineers 3

Basic methods of analysis: introduction to complex variables; special functions including Bessel functions and Legendre polynomials; Fourier series and integrals; partial differential equations; and emphasis on engineering applications.

PREREQ: MATH 302.

RESTRICTIONS: For engineering students.

MATH 518 Mathematical Models and Applications 3

Illustration and analysis of mathematical models for problems in the biological, physical and social sciences.

PREREQ: MATH 230.

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: MATH 221 and MATH 349.

MATH 540 Geometry 3

Axiomatic systems, affine geometry, Euclidean and projective geometry, and transformations.

PREREQ: MATH 349.

RESTRICTIONS: Graduate credit only for teachers.

MATH 555 Applied Calculus for Business and Economics 3

Accelerated version of the usual two-semester undergraduate preparation in calculus.

RESTRICTIONS: Requires high school algebra. Designed for students enrolling in M.B.A. program.

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.

RESTRICTIONS: Open to mathematical science graduate students only.

MATH 601 Advanced Calculus - Introduction to Analysis I 3

Limits, continuity, sequences and series, theory of differentiation and integration, and several variable calculus.

PREREQ: MATH 260.

MATH 602 Advanced Calculus - Introduction to Analysis II 3

Continuation of MATH 601.

PREREQ: MATH 600 or MATH 601.

MATH 605 Applied Functional Analysis 3

Introduction to formulation and solution of problems of engineering and science by means of functional analytic methods in Hilbert and Banach spaces. Includes boundary and initial value problems in ordinary and partial differential equations as well as integral equations. Emphasis on constructive techniques: variational methods, approximate solutions, bounds for eigenvalues, etc.

PREREQ: MATH 514, PHYS 608, MEEG 864 or advanced calculus.

MATH 609 Intermediate Ordinary Differential Equations with Applications 3

Theory and applications of ordinary differential equations; existence theorems of linear and nonlinear systems, oscillation theorems, stability theory, and Sturm-Liouville theory.

PREREQ: MATH 302, MATH 349 and two semesters of advanced calculus.

MATH 610 Introduction to Partial Differential Equations with Applications 3

Introduction to partial differential equations: equations of mathematical physics and their classical theories emphasizing boundary and initial value problems and their interpretations.

PREREQ: Two semesters of advanced calculus.

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: MATH 503 or MEEG 863 or PHYS 207

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, simulations of applied problems.

PREREQ: MATH 503 or MEEG 863 or PHYS 207

MATH 613 Applied Symbolic Computation 3

See CISC 623 for course description.

MATH 616 Introduction to Applied Mathematics I 3

Introduction to formulation of mathematical problems for systems of interest outside mathematics, particularly those from engineering and physics; systems studied vary; emphasis on interplay between system and mathematical model.

PREREQ: Two semesters of advanced calculus and PHYS 208.

MATH 617 Introduction to Applied Mathematics II 3

Methods of attack on mathematical problems for systems of interest outside mathematics; calculus of variations techniques; interpretation of solutions to problems in terms of systems.

PREREQ: MATH 616.

RESTRICTIONS: Familiarity with systems treated acceptable in lieu of Prereq.

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; Chebyshev's inequality; and law of large numbers and central limit theorem. May be cross-listed with STAT 601.

MATH 631 Introduction to Stochastic Processes 3

Classical stochastic processes with emphasis on their properties, which do not involve measure theory. Course contents: Markov chains in discrete and in continuous time with examples from random walk, birth and death processes, branching processes and queueing theory. Renewal and Markov renewal processes. Basic notions of Brownian motion and second-order processes.

PREREQ: MATH 630.

MATH 632 Topics in Applied Probability 3

The application of probability theory or stochastic processes in a specific area of science. May include treatment of probabilistic methods not ordinarily covered in other courses. Possible topics are the theory of queues, dams and inventories, replacement and reliability, probability models in population growth and biomathematics, Monte Carlo simulation, algorithmic methods in probability and operational methods.

MATH 650 Abstract Algebra 3

Integers (ordering, Euclidean algorithm and Chinese Remainder theorem); Polynomials and Rings (Fundamental Theorem of Algebra, Gauss's Lemma and Lagrange Interpolation); Fields (Primitive elements, simple extensions, and discriminant); and Groups (theorems of Lagrange, Cayley and Sylow).

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

Selected topics from graph theory, combinatorial designs, finite geometries, extremal and probabilistic combinatorics. Applications to combinatorial optimization, experimental design and analysis of algorithms.

PREREQ: MATH 688.

COREQ: MATH 650.

MATH 694 Methods of Optimization 3

Review of linear programming, unconstrained and constrained non-linear programs, numerical methods, Kuhn-Tucker theory, duality and Lagrange methods.

MATH 801 Calculus of Variations 3

Comprehensive introduction to variational principles and methods in science and engineering; classical calculus of variations with applications to mechanics; problems of optimal control; direct methods including the method of Faedo-Gelerkin. Emphasis on applications.

RESTRICTIONS: Requires familiarity with concepts of advanced calculus.

MATH 804 Topics in Optimization 3

Selected topics from the following: variational inequalities theory of optimal control, complex analysis and nonsmooth optimization, game theory, and optimization algorithms.

MATH 805 Analysis I 3

Topics include Lebesgue measure and integration, absolute continuity and functions of bounded variations, L_p spaces and Fubini's theorem.

PREREQ: MATH 602.

MATH 806 Analysis II 3

Fundamental structures of modern analysis with special emphasis on the theory of Hilbert space, spectral theorems and application to integral and differential equations.

PREREQ: MATH 805.

MATH 807 Complex Analysis 3

Complex numbers; analytic functions; geometry of elementary functions; integrals; power series; residues and poles.

PREREQ: MATH 602.

MATH 808 Complex Analysis 3

Conformal mapping with applications; analytic continuation; Riemann surfaces; elliptic functions; and infinite products.

PREREQ: MATH 807.

MATH 811 Topics in Classical Analysis 3

Investigation of topics chosen from function theory such as geometric function theory, Riemann surfaces, meromorphic and entire functions, etc.

RESTRICTIONS: Requires permission of instructor.

MATH 815 Functional Analysis 3

Topological vector spaces with short introductory review of Banach spaces.

PREREQ: MATH 806.

MATH 818 Theory of Ordinary Differential Equations 3

Linear systems with isolated singularities and periodic coefficients; boundary value problems; Poincare-Bendixon theory.

PREREQ: MATH 609 and MATH 805.

MATH 819 Theory of Ordinary Differential Equations 3

Singular Sturm-Liouville theory; asymptotic behavior of linear and nonlinear systems; and topics of current research.

PREREQ: MATH 818.

MATH 822 Integral Equations 3

Fredholm and Hilbert-Schmidt theories of Fredholm integral equations of the second kind. Equations of the first kind. Volterra equations. Nonlinear eigenvalue problems. Applications to physics and engineering.

RESTRICTIONS: Requires permission of instructor.

MATH 823 Integral Equations 3

Singular integral equations (Carleman and Wiener-Hopf equations). Nonlinear integral equations (Volterra and Hammerstein equations). Nonlinear singular integral equations. Applications to physics and engineering (the nonlinear oscillator, the airfoil equation, the Tricomi Problem in partial differential equations, etc.).

PREREQ: MATH 822

MATH 824 Topics in Applied Mathematics 3

Topics chosen from asymptotic analysis, elasticity, electromagnetic theory, fluid dynamics, optimal control theory and other areas.

RESTRICTIONS: Requires permission of instructor.

MATH 825 Topics in Applied Mathematics 3

Topics chosen from asymptotic analysis, elasticity, electromagnetic theory, fluid dynamics, optimal control theory and other areas.

RESTRICTIONS: Requires permission of instructor.

MATH 827 General Topology I 3

Generation and properties of topological spaces. Continuity, separation and countability properties; and convergence of nets and filters.

MATH 828 General Topology II 3

Compactness and connectedness, metrization, uniform spaces, and basic homotopy theory.

PREREQ: MATH 827.

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.

PREREQ: MATH 610.

MATH 836 Partial Differential Equations II 3

Cauchy's problem and initial boundary value problems for hyperbolic and parabolic equations and systems. Boundary value problems for elliptic equations and systems. Equations of mixed type. Emphasis on modern approaches.

PREREQ: MATH 835 and MATH 805.

MATH 838 Numerical Methods for Partial Differential Equations 3

Introduces concepts of consistency, stability and convergence of numerical schemes. Emphasis on various finite difference schemes and their applications to fundamental partial differential equations.

PREREQ: MATH 610.

MATH 839 Numerical Methods for Partial Differential Equations 3

Emphasis on finite element method and its applications to physical problems.

PREREQ: MATH 838.

MATH 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 crystallographic groups, and the group Knapsack problem.

PREREQ: MATH 650.

MATH 846 Field Theory with Applications 3

Field extensions, structure of finite fields, and basics 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: MATH 650, MATH 672, and MATH 845.

MATH 850 Foundation of Probability Theory 3

Mathematically rigorous treatment of the foundations of probability theory. Families of sets, semi-ring 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 iterated logarithm.

PREREQ: MATH 630 and MATH 805.

MATH 851 Stochastic Processes 3

Mathematically rigorous treatment of stochastic processes. Course content: general definitions, separability, Kolmogorov consistency condition. Markov processes and Brownian motion. In-depth discussion of topics such as weak convergence of processes, martingale theory, diffusion processes or second order processes, as announced by instructor.

PREREQ: MATH 850.

MATH 868 Research 1-6

MATH 869 Master's Thesis 1-6

MATH 870 Reading in Mathematics 1-6

MATH 887 Mathematical Methods of Physics and Engineering 3

Green's function and eigenfunction expansions for boundary value problems, theory of distributions, weak solution, metric spaces, contractions, integral equations and Hilbert spaces.

PREREQ: MATH 503, MATH 508 or MEEG 863, MEEG 864 or PHYS 607, and PHYS 608.

MATH 969 Doctoral Dissertation 1-12 PF

Mechanics

MECH 305 Fluid Mechanics 3

Incompressible fluid mechanics: fluid statics, control volume analysis of fluid flows, differential analysis of inviscid and viscous fluid flows and dimensional analysis.

PREREQ: CIEG 212 or MEEG 213 and MATH 302.

COREQ: MECH 306.

MECH 306 Fluid Mechanics Laboratory 1

Experiments in fluid mechanics.

COREQ: MECH 305.

Medical Technology

MEDT 100 Introduction to Medical Technology 1 PF

MEDT 366 Independent Study 1-6

MEDT 372 Diagnostic Parasitology 2

Study of human parasites, emphasizing detection and identification of diagnostic forms.

RESTRICTIONS: Open to Medical Technology majors only.

MEDT 376 Clinical Virology and Immunology 2

Fundamentals of diagnostic virology, chlamydiology and serology, including theory, disease 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 3

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 4

Introduction to basic laboratory principles, mathematics, quality control and spectrophotometry. Application and theory of manual and automated techniques used in diagnostic and therapeutic medicine. Emphasis on clinical procedures for carbohydrates, proteins, lipids, inorganic ions, blood gases and pH, and electrolytes.

RESTRICTIONS: Open to Medical Technology majors only.

MEDT 402 Medical Mycology 1

Epidemiology, pathology and diagnosis of human mycoses. Identification of pathogenic and saprobic fungi found in clinical specimens.

COREQ: MEDT 412

RESTRICTIONS: Open to Medical Technology majors only.

MEDT 403 Clinical Physiological Chemistry II 3

Application and theory of methodologies in enzymology, endocrinology and toxicology. Relationship of normal and abnormal laboratory findings in organ functional tests.

PREREQ: MEDT 401.

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 hemostasis.

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: MEDT 404.

MEDT 406 Medical Microbiology 3

Study of the occurrence and pathogenesis of human infections and microorganisms associated with humans in health and disease.

RESTRICTIONS: Open to Medical Technology majors only.

MEDT 407 Diagnostic Microbiology 2

Diagnostic microbiology, emphasizing the correlation of in vitro and in vivo findings in the diagnosis and treatment of infectious disease.

PREREQ: MEDT 406 and MEDT 416.

COREQ: MEDT 417.

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 PF

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 MEDT 401.

COREQ: MEDT 401.

MEDT 412 Medical Mycology Laboratory 1

Laboratory procedures consistent with MEDT 402.

COREQ: MEDT 402.

MEDT 413 Clinical Physiological Chemistry Laboratory II 2

Laboratory exercises that complement the topics covered in MEDT 403.

COREQ: MEDT 403.

MEDT 414 Hematology I Laboratory 1

Study and implementation of laboratory procedures that correlate with the material taught in MEDT 404.

COREQ: MEDT 404.

MEDT 415 Hematology II Laboratory 2

Study and implementation of laboratory procedures in hematology consistent with the material taught in MEDT 405.

COREQ: MEDT 405.

MEDT 416 Medical Microbiology Laboratory 2

Laboratory study of microorganisms important in the normal flora and infectious diseases of humans.

COREQ: MEDT 406.

MEDT 417 Diagnostic Microbiology Laboratory 2

Laboratory procedures consistent with MEDT 407.

COREQ: MEDT 407.

MEDT 418 Medical Technology Senior Seminar 1 PF

Readings, project reports, career planning and orientation for clinical education.

RESTRICTIONS: Requires Senior and major status.

MEDT 419 Immunohematology I Laboratory 1

Laboratory procedures consistent with MEDT 409.

COREQ: MEDT 409.

MEDT 420 Immunohematology II 1

Study of blood and component transfusions, their risks, complications and quality assurance. Also blood component therapy and testing of the neonate and adult.

PREREQ: MEDT 409.

MEDT 421 Immunohematology II Laboratory 1

Laboratory procedures consistent with MEDT 420.

COREQ: MEDT 420.

MEDT 466 Independent Study 1-6**MEDT 470 Medical Technology Clinical Education 3 PF**

Clinical experience in the application of laboratory theory and techniques in urinalysis, serology and phlebotomy. Emphasis on team concept of health care provided through medical seminars and conferences with clinical laboratory managers.

MEDT 471 Clinical Laboratory Management Seminar 1 PF

Discussion of laboratory management areas as they relate to the employer and employee. Emphasis on communication, motivation, interviewing, staffing, job descriptions, government regulations and capital budgeting as they relate to the medical technologist and laboratory.

MEDT 473 Clinical Chemistry Practicum 3 PF

Supervised experience in the application of laboratory theory and techniques in clinical chemistry.

PREREQ: MEDT 403 and MEDT 413.

MEDT 475 Clinical Hematology 3 PF

Supervised experience in the application of laboratory procedures in hematology.

PREREQ: MEDT 405 and MEDT 415.

MEDT 477 Clinical Microbiology 3 PF

Supervised experience in the application of laboratory procedures in diagnostic microbiology.

PREREQ: MEDT 402 and MEDT 412, and MEDT 407 and MEDT 417.

MEDT 479 Clinical Immunohematology 3 PF

Supervised experience in the application of laboratory procedures in immunohematology.

PREREQ: MEDT 420 and MEDT 421.

Mechanical Engineering

MEEG 125 Introduction to Engineering 3

Elementary engineering problems, design and programming valuable to students beginning a mechanical engineering program.

MEEG 213 Principles of Mechanics I 3

Vector and scalar methods applied to the statics of rigid and elastic bodies. Introduction to theories of stress, strain and mechanics of materials. Emphasis on solution of two- and three-dimensional engineering problems.

PREREQ: PHYS 207.

COREQ: MATH 243.

MEEG 214 Principles of Mechanics II 3

Intermediate-level development of the kinematics and dynamics of particle systems and rigid bodies with an introduction to the variational principles of mechanics. Emphasis on engineering methods and applications to machines, structures and vehicles.

PREREQ: PHYS 207 and MEEG 213.

COREQ: MATH 302.

MEEG 302 Heat Transfer 3

Laws and applications of heat transfer by conduction, convection and radiation.

PREREQ: MEEG 307.

MEEG 307 Thermodynamics I 3

Introduction to thermodynamics from phenomenological and classical viewpoints. Zeroth, First and Second Laws, and thermodynamic properties. Applications. Introduction to power and refrigeration cycles.

PREREQ: MATH 302.

MEEG 308 Thermodynamics II 3

Properties of mixtures, phase equilibrium, chemical reactions, combustion processes, application of fundamental principles to work-producing and work-absorbing systems, and elements of heat transfer processes in thermodynamic systems.

PREREQ: MEEG 307.

MEEG 313 Strength of Materials 4

Concepts of stress, strain and material response. Load-deflection for axial and torsional members. Bending, shear and deflection in beams. Elastic stability and energy methods.

PREREQ: MEEG 213.

MEEG 316 Materials Engineering 3

Selection and utilization of materials. Practical examples and scientific background. Defects arising from casting, heat treatment, fabrication, machining, welding and sintering; and relationship to component failure. Strengthening methods. Behavior of materials under creep fatigue and bearing conditions; the influence of corrosion and irradiation. Embrittlement.

PREREQ: MASC 302.

MEEG 336 Fluid Mechanics II 3

Compressible flows. Isentropic flow. Shock waves. Fluid machinery. Compressors, pumps and turbines. Inviscid flows. Potential and stream functions, elementary wing theory, and potentials via analytic solution and approximate methods.

PREREQ: MECH 305.

MEEG 347 Mechanical Design I 3

Kinematic analysis of machines and mechanisms, kinematic synthesis, cam design, gear train analysis, balancing and machine dynamics.

PREREQ: MEEG 125 and MEEG 214.

MEEG 348 Mechanical Design II 3

Statistical methods in design; theories of failure and design for strength; and design of machine elements.

PREREQ: MEEG 347 and MEEG 313.

MEEG 361 Applied Engineering Analysis 3

Linear algebra; vector field theory; Fourier series and partial differential equations. Engineering applications.

PREREQ: MATH 302.

MEEG 366 Independent Study 1-6**MEEG 391 Engineering Science Laboratory 4**

An introduction to engineering experimentation with experiments drawn from subjects without scheduled laboratories such as heat transfer, thermodynamics, vibrations, gas dynamics, etc. Lectures cover topics in treatment of experimental data, error analysis and analytic techniques useful to the experimentalist.

PREREQ: MECH 305, MEEG 214, MEEG 307 and MEEG 361.

MEEG 408 Power Generation System Design 3

Design details and performance characteristics of fossil fuel fired steam power plants. Total heat systems and peaking systems. Power generation economics. Aspects of environmental impact.

PREREQ: MEEG 307.

MEEG 410 Experimental Mechanics for Composite Materials 3

Study of the micromechanical and thermomechanical response of composite materials. Execution and assessment of experiments conducted to investigate the strength and stiffness characteristics of composite material and structural elements.

PREREQ: MEEG 313.

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 undersea vehicles, pressure vessels and other continuous structures.

PREREQ: MEEG 214 and MEEG 313.

MEEG 413 Advanced Mechanics of Materials 3

Intermediate topics in structural analysis and mechanics of materials. Introduction to energy methods and failure analysis.

PREREQ: MEEG 313 and MATH 302.

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: MEEG 313.

MEEG 423 Vibrations 3

Introduction to mechanical vibrations and structural dynamics. Analysis and synthesis by matrix and energy methods. Applications to machine design, vehicle dynamics and shock and vibration isolation.

PREREQ: MEEG 213 and MEEG 214.

MEEG 427 System Dynamics 3

Introduction to the modelling, analysis and synthesis of dynamic systems. Emphasis on the elements of vibrations, automatic control, and on mechanical and aerospace system applications.

PREREQ: MEEG 214, MATH 302.

MEEG 432 Aerodynamics 3

Theoretical and computational aerodynamics. Review of fluid mechanics. Airfoils and finite wings in incompressible flow. Panel and vortex-lattice methods. Complex variable techniques. Boundary-layer theory.

PREREQ: MECH 305.

MEEG 435 Propulsion 3

Motion in non-internal frames and air-breathing engines (inlets, combustors, compressors and turbines). Rockets and marine propulsion.

MEEG 436 Fluid Machinery 3

Classification, purpose of axial, radial, mixed flow devices. Cascade theory. Effects of viscosity and compressibility. Hydraulic pumps, turbines, cavitation. Wind-driven rotors.

PREREQ: MECH 305.

RESTRICTIONS: MEEG 307 recommended as a Prerequisite.

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

Lectures on engineering case studies, project planning and engineering ethics; project work emphasizing project definition and evolution of design concepts.

MEEG 448 Design and Systems Synthesis II 3

Lectures on engineering case studies and patents, engineering economics; project work emphasizing implementation of a design concept through detailed design, analysis and prototype testing.

PREREQ: MEEG 447.

MEEG 466 Independent Study 1-6**MEEG 600 Seminar 1****MEEG 614 Fracture of Materials 3**

See MASC 614 for course description.

MEEG 615 Mechanical Properties of Materials 3

See MASC 615 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 617 Composite Materials 3

Elements of elasticity theory; tensorial transformation equations; elastic symmetries and engineering constants; two-dimensional composites; laminated composites; analysis of composite structures; micromechanics theories of composites; and material aspects of composite materials.

MEEG 625 Vehicle Dynamics 3

Mechanics of road and off-road vehicles. Mechanics of pneumatic tires, performance of road vehicles, vehicle handling, introduction to random vibrations, ride and passenger comfort, and performance of off-road vehicles.

MEEG 626 Random Vibration 3

See CIEG 616 for course description.

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: MEEG 361.

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 802 Conduction Heat Transfer 3

The solution of problems in conduction in rectangular, cylindrical and spherical coordinates involving heat sources, constant and varying boundary conditions. Use of Fourier series, Fourier integral, Laplace equations, method of images. Nonlinear problems.

PREREQ: MEEG 361 or MATH 514.

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: MEEG 361 or MATH 514.

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 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

Experimental foundations. Additional stress and strain relations. Geometric representation of yield criteria. Elasto-plastic flow laws and energy theorems. Incremental solutions, slip line theory and creep.

PREREQ: MEEG 813.

MEEG 815 Finite Element Analysis 3

Develops the theory of the finite element method and illustrates its application to problems in solid mechanics, fluid mechanics and heat transfer.

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: MEEG 813.

MEEG 817 Composite Materials 3

Heterogeneous material systems; continuous and discontinuous filament reinforcement; interface and surface consideration; modes of failure; macroscopic elastic properties from properties of constituents; mechanics of structures composed of composite materials; and thermal and dynamic effects.

PREREQ: MEEG 813.

MEEG 818 Plates and Shells in Aerospace Structures I 3

Theory of plates from three-dimensional equations of elasticity. Small deflection analysis of rectangular and circular plates. Thermoelastic effects. Analysis of orthotropic plates, multilayered plates and sandwich panels. Green's functions. Energy methods. Reissner variational theorem for plates of moderate thickness. Large deflections of plates.

PREREQ: MEEG 813.

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. Thermoelastic effects. General bending theory, membrane theory, inextensional theory. Donnell equations. Edge load solutions. Orthotropic shells. Laminated shells.

PREREQ: MEEG 813.

MEEG 821 Advanced Dynamics 3

General principles of spatial dynamics. Lagrangian and Hamiltonian methods. Application to engineering problems.

MEEG 822 Servomechanisms and Controls 3

Linear and nonlinear analysis and synthesis of mechanical, electrical, hydraulic and pneumatic systems. Use of Laplace transform and other techniques. Stability and performance criteria.

MEEG 823 Vibration Analysis 3

Engineering analysis of the vibrations of machines and structures. Free, forced and random vibrations with emphasis on linear, multidegree-of-freedom systems by matrix and energy methods. Introduction to the Lagrangian method and normal coordinate analysis of complex systems.

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 I 3

Physical properties of fluids, description of motion, vector and tensor algebra, Navier-Stokes equations, kinetic theory of gases, incompressible viscous flows, boundary-layer theory, and turbulence.

PREREQ: MEEG 361 or MATH 514.

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, hypoeasticity, simple and nonsimple fluids, and solutions of special problems in these areas.

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, Pade approximants, straining, and multiple scales; similarity methods; catastrophe theory; and chaos. Engineering applications.

MEEG 863 Engineering Analysis I 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 864 Engineering Analysis II 3

Continuation of partial differential equations; complex variables; variational calculus. Engineering applications.

PREREQ: MEEG 863.

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 969 Doctoral Dissertation 1-12 PF

Military Science

MLSC 105 Basic Leadership I 1

Concepts of leadership; basic organizational leadership; rappelling, introduction to weapons familiarization and tactical battlefield leadership; decision-making/problem-solving process.

MLSC 106 Basic Leadership II 1

Use of maps; introduction to communications and counselling; methods of presenting instruction and briefings; introduction to branches of the Army.

MLSC 205 Problem Solving 1

Principles of military organization; exercises in management planning and organizing; continued development of decision-making and problem-solving capabilities; and introduction to individual military training.

MLSC 206 Military Organizations 1

Methods of presenting instruction; practical exercise in patrolling; physical training instruction; introduction to military drill; and evaluation of problem-solving skills.

MLSC 305 Applied Leadership I 2

Leadership and management case studies; the military manager's role in today's Army; military drill; basic weapons familiarization; and advanced physical training instruction.

RESTRICTIONS: Requires permission of instructor.

MLSC 306 Applied Leadership II 2

Continued analysis of leadership and management case studies; military tactics applied to squads and platoons; practical exercise under field conditions; and orienteering.

PREREQ: MLSC 305.

MLSC 366 Independent Study 1-3**MLSC 405 Military Management I 2**

Management by objectives; individual leadership assignments; administrative management; logistics management; Army readiness program; and the role of the Army in the contemporary world.

PREREQ: MLSC 306.

MLSC 406 Military Management II 2

Military law; operational techniques of the military team; role of the second lieutenant in today's Army; and individual leadership assignments.

PREREQ: MLSC 306.

MLSC 466 Independent Study 1-3

Museum Studies

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 AMST 403, ARTH 403 and/or HIST 403.

MSST 605 History of Theories in Material Culture 3

See EAMC 605 for course description.

MSST 629 Seminar in Historic Preservation 3

See URAF 629 for course description.

MSST 630 Historic Preservation Studio 3

See URAF 630 for course description.

MSST 645 Things in History 3

See HIST 645 for course description.

MSST 655 Archival Management I 3

See HIST 655 for course description.

MSST 656 Archival Management II 3

See HIST 656 for course description.

MSST 657 Historical Archaeology and Museum Interpretation 3

See HIST 657 for course description.

MSST 801 Museum Curatorship: Collections Management 3

A course on curatorial and registrarial theory and practices that focuses on the administration, identification, 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 Management of Museums 3

Treats the 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. Lectures, discussions, case studies, guest presentations and practicums.

RESTRICTIONS: Open to graduate students only.

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 HIST 804.

RESTRICTIONS: Open to graduate students only. Requires at least one semester course in Museum Studies and permission of instructor.

MSST 805 Historical Properties 3

Administration 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 806 Museum Curatorship: Exhibition of Artifacts 3

Treats the process of museum exhibition of artifacts including research, planning, exhibit philosophy and techniques, and promotion. Combines lectures and the practical experience of planning and mounting an exhibition at the Hagley Museum. Emphasis on permanent exhibitions at medium- and large-size museums.

RESTRICTIONS: Open to graduate students only. Requires permission of instructor. Offered in alternate years.

MSST 807 Museum Curatorship: Temporary and Economical Exhibits 3

Focuses on the 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 808 Museum Education and Interpretation 3

The theory, strategies, practices, evaluation and administration of learning in a museum environment with emphasis on interpretation of collections through a variety of instructional means. Lectures, discussions, field trips, program planning, curriculum development, proposal writing, audience studies, practice teaching and special project work with area museums.

RESTRICTIONS: Open to graduate students only.

MSST 810 Environmental Institution Management 6

Seminar sessions at Delaware Nature Society headquarters with staff and guest lecturers, including attorneys, investment counselors and museum administrators. 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.

Music Education

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: MUSC 335.

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: MUSC 335.

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: MUED 279.

RESTRICTIONS: For music majors.

MUED 381 Music in Early Childhood 3

Methods and materials for developing musical skills and understanding of children ages three to eight. Includes clinical experience.

RESTRICTIONS: For majors in Colleges of Education and Human Resources.

MUED 385 Music for the Special Learner 3

Analysis of types of exceptional learners and analysis of music materials and methods appropriate for special learners.

RESTRICTIONS: For College of Education elementary majors and College of Human Resources young exceptional children 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 466 Independent Study 1-3

MUED 479 Secondary Music Materials and Approaches 3

Procedures and materials used for teaching music in the secondary school.

PREREQ: MUED 379.

RESTRICTIONS: Requires permission of instructor.

MUED 559 Field Workshop 1-4

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.

MUED 575 Music in Early Childhood 3

Advanced study of musical content and techniques of teaching.

RESTRICTIONS: For experienced teachers.

MUED 576 General Music: Middle School and High School 3

Methods and materials for involving students in musical experiences.

RESTRICTIONS: For experienced teachers.

Music

MUSC 061 Private Study 1-8 R

RESTRICTIONS: Requires audition and departmental placement tests. Credits do not apply toward bachelor's degree.

MUSC 062 Private Study 1-8 R

PREREQ: MUSC 061.

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 MUSC 101 with emphasis on the larger forms - symphonies, operas, oratorios, concertos - and the 20th century.

PREREQ: MUSC 101.

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; the roles of the chorus. Includes one experience seeing an opera performed live.

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 MUSC 105. Survey and analytical approach to music styles. Composing original works for voice and instruments.

PREREQ: MUSC 105.

MUSC 109 Choral Union 1

Members enter by audition or permission of instructor for inclusion in one of the following organizations: Choral Union, Chorale and University Singers.

RESTRICTIONS: May be repeated for credit.

MUSC 111 Introduction to Music History 3

A survey of selected works in music history with emphasis on selected basic terminology, forms and style changes, through score reading and listening.

RESTRICTIONS: Open to music majors and minors only.

MUSC 115 Band 1

Marching band and Concert band during football season. At close of the football season, Wind Ensemble and Symphonic Band. Representative original and transcribed works performed.

RESTRICTIONS: Audition required for entrance to Wind Ensemble and Symphonic Band. 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 119 Gamelan Traditions of Indonesia 3

A performance-oriented introductory course in the "knobbed gong" musical traditions of Java and Bali. Includes traditional as well as contemporary literature study, theoretical analysis and historical overview, with performance experience.

MUSC 121 Gamelan Ensemble 1

Gamelan is the largest instrumental ensemble from Southeast Asia, and is considered the "orchestra of the Eastern world." This is a performing ensemble, dealing with traditional and contemporary Japanese and Balinese literature.

RESTRICTIONS: Open to anyone without prior musical experience. May be repeated for credit.

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: MUSC 161.

RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 171 Diction: English 1

A study of pronunciation rules for singing in English and introduction to International Phonetic Alphabet. Includes practicum.

COREQ: Enrollment in applied study.

MUSC 172 Diction: Italian 1

A study of pronunciation rules for singing in Italian. Includes practicum.

COREQ: 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 mechanism.

RESTRICTIONS: Requires permission of instructor for nonmajors. Requires one semester of University vocal experience.

MUSC 175 Class Piano: Elementary I 1

Beginning piano primarily for the vocal or instrumental music major. Basic techniques, reading, transposition and playing by ear.

RESTRICTIONS: Requires Musicality Test.

MUSC 176 Class Piano: Elementary II 1

A continuation of MUSC 175. Scale and arpeggio playing, keyboard harmony, repertoire of pieces appropriate to technical ability.

PREREQ: MUSC 175 and MUSC 195.

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 ability in the aural recognition of melody, harmony and rhythm.

COREQ: MUSC 195.

RESTRICTIONS: Requires permission of instructor.

MUSC 186 Ear Training and Sight Singing II 2

Techniques of sight singing and music reading skills. Development of ability in the aural recognition of melody, harmony and rhythm.

PREREQ: MUSC 185 and MUSC 195.

COREQ: MUSC 196.

MUSC 189 Piano for the Classroom 1

Functional piano skills.

RESTRICTIONS: For teachers of elementary school children.

MUSC 190 Jazz Improvisation 3

Techniques of harmonic, rhythmic and melodic embellishment and improvisation in jazz.

RESTRICTIONS: Requires intermediate level of performance.

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 MUSC 193.

PREREQ: MUSC 193.

MUSC 195 Harmony I 3

Review of music fundamentals. Diatonic harmony including part-writing with keyboard application. Chord structures and functional relationships. Basic melodic and contrapuntal compositional techniques. Writing, playing and analysis.

COREQ: MUSC 185.

RESTRICTIONS: Requires permission of instructor.

MUSC 196 Harmony II 3

Continuation of harmony: diatonic through chromatic harmony with keyboard application. Chord structures and functional relationships. Basic melodic and contrapuntal compositional techniques. Writing, playing and analysis.

PREREQ: MUSC 185 and MUSC 195.

COREQ: MUSC 186.

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: MUSC 105.

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 performance/demonstrations. Goal is the understanding and appreciation of various world musics.

PREREQ: MUSC 105.

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.

MUSC 208 History of the American Musical Theatre 3

The musical-dramatic forms of the 18th, 19th and 20th century in the United States and their impact on the modern musical theatre. Complete works read in class and compared to a series of criteria found in successful modern shows. Comparison of older and current works. May be cross-listed with THEA 208.

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: MUSC 215 and MUSC 216 to be taken consecutively in one academic year.

MUSC 216 Low Brass Instruments Class 1

Development of performing and teaching skills.

RESTRICTIONS: MUSC 215 and MUSC 216 to be taken consecutively in one academic year.

MUSC 217 Woodwind Instruments Class I 1

Development of performing and teaching skills.

RESTRICTIONS: MUSC 217 and MUSC 218 to be taken consecutively in one academic year.

MUSC 218 Woodwind Instruments Class II 1

Development of performing and teaching skills.

RESTRICTIONS: MUSC 217 and MUSC 218 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.

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: MUSC 241.

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-contact-hour studio class.

PREREQ: MUSC 162.

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-contact-hour studio class.

PREREQ: MUSC 261.

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 practicum.

COREQ: Enrollment in applied study.

MUSC 272 Diction: French 1

A study of pronunciation rules for singing in French. Includes practicum.

COREQ: Enrollment in applied study.

MUSC 273 Class Voice: Intermediate 1

Basic voice study. Repertoire technique and vocal problems isolated through performance, research and discussion.

PREREQ: MUSC 173 and MUSC 174.

RESTRICTIONS: One year of university-level vocal experience acceptable in lieu of Prerequisites. For music majors and students with exceptional vocal ability.

MUSC 274 Class Voice: Advanced 1

Basic voice.

PREREQ: MUSC 273.

RESTRICTIONS: For music majors and students with exceptional vocal ability.

MUSC 275 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: MUSC 176 and MUSC 196.

RESTRICTIONS: For vocal or instrumental music majors with some background in piano playing.

MUSC 276 Class Piano: Intermediate II 1

A continuation of MUSC 275.

PREREQ: MUSC 275.

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 repertoire.

PREREQ: MUSC 181.

RESTRICTIONS: Requires audition.

MUSC 285 Advanced Ear Training and Sight Singing I 2

Continuation of MUSC 185 and MUSC 186.

PREREQ: MUSC 186 and MUSC 196.

COREQ: MUSC 295.

MUSC 286 Advanced Ear Training and Sight Singing II 2

Continuation of MUSC 185, MUSC 186 and MUSC 285.

PREREQ: MUSC 285 and MUSC 295.

COREQ: MUSC 296.

MUSC 287 Computing in Music 3

Comprehensive overview of applications of computers to composition, analysis, printing, teaching and synthesis of music. Instruction in BASIC and PASCAL languages. Students concentrate on the language that best suits individual projects. Concepts include variables, loops, encoding, string processing, tables, matrices, graphics, joystick control of sound and graphics, subroutines, procedures, functions, file structures and interaction with sound and graphics chips.

PREREQ: MUSC 105 or MUSC 195.

MUSC 293 Jazz Improvisation I 3

A comprehensive study of jazz improvisation vocabulary 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: MUSC 197.

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: MUSC 293.

MUSC 295 Advanced Harmony I 3

Review of chromatic harmony. Study, writing and analysis of 18th-century counterpoint. Introduction to instrumentation. Introduction to form and analysis. Eighteenth- and nineteenth-century harmony, techniques and styles. Original compositions.

PREREQ: MUSC 186 and MUSC 196.

COREQ: MUSC 286.

MUSC 296 Advanced Harmony II 3

Continuation of MUSC 295. Study of late 19th- and 20th-century harmony, techniques and styles. Continuation of instrumentation. Original compositions.

PREREQ: MUSC 285 and MUSC 295.

COREQ: MUSC 286.

MUSC 301 Junior Recital 0 PF

A 30-minute public recital.

RESTRICTIONS: Requires Junior status and permission of instructor.

MUSC 303 Chamber Music Literature 3

Chamber music written for various combinations from the Baroque period to the present.

PREREQ: MUSC 111, or MUSC 101 and MUSC 102.

MUSC 305 The Symphony 3

The development of the symphony from the early 18th century to the present.

PREREQ: MUSC 111 or MUSC 101.

MUSC 307 Music in American Culture 3

Music in the United States from 1620 to 1875. Folk music in an expanding nation. The evolution of jazz.

MUSC 308 Music in American Culture 3

The development of the United States as an international leader in musical composition, performance and technology 1865 to the present. Also, the history of the Broadway musical.

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: MUSC 111 or MUSC 101.

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: MUSC 111 or MUSC 101.

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: MUSC 111 or MUSC 101.

MUSC 321 Ensemble: 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 3

Study of style, structure and interpretations of representative choral works, including large and small forms composed since 1500.

PREREQ: MUSC 111.

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: MUSC 296.

MUSC 335 Basic Conducting 2

The principles of conducting and score reading.

PREREQ: MUSC 286 and MUSC 296.

MUSC 341 Accompanying Chamber Music: Piano 1

Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.

PREREQ: MUSC 242.

MUSC 342 Accompanying Chamber Music: Piano 1

Accompanying vocalists and instrumentalists and in the performance of chamber music with keyboard.

PREREQ: MUSC 341.

MUSC 345 History of Theatre: American Musical Theatre 3

See THEA 345 for course description.

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 a one-contact-hour studio class.

PREREQ: MUSC 262.

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 a one-contact-hour studio class.

PREREQ: MUSC 361.

RESTRICTIONS: Contact department to register for correct number of credit hours.

MUSC 363 Keyboard Literature I 3

Style, structure and technical performance of keyboard music from the 17th century to the present.

PREREQ: MUSC 262.

MUSC 364 Keyboard Literature II 3

Intensive study of one composer or style period from the keyboard repertory. Content varies from year to year.

PREREQ: MUSC 363.

MUSC 365 Vocal Coaching I 1

Junior Recital Preparation. Coaching in the various styles and interpretations of works included in recital program.

RESTRICTIONS: Requires successful completion of Sophomore review.

MUSC 366 Independent Study 1-3**MUSC 375 Class Piano: Advanced I 1**

Small groups of vocal or instrumental music majors. Techniques, reading and repertory.

PREREQ: MUSC 276.

MUSC 376 Class Piano: Advanced II 1

A continuation of MUSC 375.

PREREQ: MUSC 375.

MUSC 385 Electronic Music I 3

An introduction to electronic music including analytical study of electronic compositions and actual experience with synthesizers.

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 Twentieth-Century Music 3

Detailed analysis of styles and techniques of modern composers, beginning with Debussy and Ravel.

PREREQ: (Majors) MUSC 313 and (Nonmajors) MUSC 101.

MUSC 420 Advanced Composition 3

Creative writing in the vocal and instrumental media with individual and group criticism.

PREREQ: MUSC 397.

RESTRICTIONS: May be repeated for 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 Faure, 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 441.

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 362.

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 465 Vocal Coaching II 1

Senior Recital Preparation. Coaching in the various styles and interpretations of works included in recital program.

PREREQ: MUSC 362 and MUSC 301 (Junior Recital).

MUSC 466 Independent Study 1-3

MUSC 479 Opera Productions 3-6

Involves all aspects in the production of opera/operetta; singing, acting and movement; and production from initial readings to public performance.

RESTRICTIONS: Requires audition.

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

Introduction to acting, preparation of roles and stagecraft. Scenes and one act operas may be performed for an audience.

RESTRICTIONS: Requires permission of instructor and Applied Music Instructor. May be repeated for up to three credit hours.

MUSC 495 Analysis for Performance 3

Examination of structural, melodic, rhythmic, harmonic and textural aspects of selected music literature and their significance in artistic performance.

PREREQ: MUSC 296.

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

Chamber music written for various combinations of instruments from the 17th century to the present, with an emphasis on performance.

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 band. 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 socio-cultural 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.

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 636 Advanced Choral Conducting 3

A study of the conducting of vocal ensemble literature of the historical periods from the Renaissance through the 20th century.

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 Philosophical Issues in Music Education 3

Examination of the role of the arts in education. Discussion of the aesthetic and pragmatic rationales for the inclusion of music in the schools. Design of curriculum goals and teaching strategies which result from a philosophy of music education.

RESTRICTIONS: Requires permission of instructor.

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 663 Advanced Keyboard Literature 3

Style, structure and technical performance of keyboard music from the 17th century to the present.

RESTRICTIONS: Requires permission of instructor.

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 I 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

Nutrition and Dietetics

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 nutritional scientists. Introduces opportunities for undergraduate research. Introduction to concepts of a profession and relevant professional organizations.

RESTRICTIONS: Open to majors with Freshman or Sophomore status.

NTDT 150 Elementary Nutrition 1

Basic knowledge of nutrition and its application to food selection.

RESTRICTIONS: Not open to Human Resources majors.

NTDT 200 Nutrition Concepts 3

Functions and sources of nutrients, dietary adequacy and dietary guidelines. Energy balance, weight control and evaluation of popular diets and ideas. Includes nutrition concerns such as world food problems, food safety, alcohol and malnutrition.

RESTRICTIONS: Credit for graduation limited to one of the following: NTDT 200 or NTDT 303.

NTDT 205 Nutrition in the Lifespan 3

Nutrition and health during the different stages of life: pregnancy, lactation, infancy, preschool years, middle childhood, adolescence, adulthood, later maturity.

PREREQ: NTDT 200 and a course in biology.

NTDT 222 Nutrition Controversies 1

Explores topical issues in nutrition via discussion format.

COREQ: NTDT 200.

NTDT 240 Introduction to Clinical Dietetics 2

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 303 Food Nutrition and Health 3

Principles of nutritional science and provision of food for health. Consumer interest in nutritional quality and safety of food.

PREREQ: CHEM 106.

RESTRICTIONS: Credit for graduation limited to one of the following: NTDT 200 or NTDT 303.

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. Safety, sanitation and technical operations in a food service system. Applied computer-assisted management.

PREREQ: NTDT 200 and FOSC 201.

NTDT 322 Food Service Systems Management 4

Organization and administration of food service systems. Function and responsibilities specific to this management. Personnel, food cost accounting, production and service facility planning, and environmental design.

PREREQ: NTDT 321, NTDT 325 or NTDT 331.

NTDT 325 Laboratory in Quantity Food Production and Service 1

Laboratory experience in quantity food production and delivery systems. Application of principles of sanitary practice, technical reporting and management.

COREQ: NTDT 321.

NTDT 326 Computer-Assisted Foodservice Systems Management 2

Investigation of microcomputers and computer software programs that could be used in the management of foodservice systems. Understanding of basic computer concepts, appropriate applications, maintenance of data bases and data integrity, use of management information reports.

PREREQ: NTDT 200 and NTDT 321.

NTDT 330 Nutrition Counseling 2

Theories, skills and techniques of nutrition interviewing and counseling. Opportunity to practice learned skills in simulated and actual clinic settings.

PREREQ: NTDT 240.

NTDT 331 Coordinated Dietetics I 6

Clinical experience in quantity food production and delivery systems, and application of technical operations.

COREQ: NTDT 321.

NTDT 332 Coordinated Dietetics II 6

Clinical experience in food service systems management. Application of functions of management, personnel, food cost accounting and facility planning.

PREREQ: NTDT 331.

COREQ: NTDT 322.

NTDT 366 Independent Study 1-6

NTDT 400 Macronutrients 3

Metabolism of carbohydrates, proteins and fats in human nutrition, interdependence and relation to energy metabolism/balance, scientific bases of macronutrient requirement during the life cycle.

PREREQ: NTDT 200, CHEM 214 and CHEM 216.

NTDT 401 Micronutrients 3

Mechanisms and interactions of vitamins and minerals in cellular metabolism, scientific bases of nutrient requirements during the life cycle.

PREREQ: NTDT 200, CHEM 214 and CHEM 216.

NTDT 403 Dietetics Seminar 1

Explores registration, specialty certification and licensure for dietitians. Discusses the roles and activities of the national professional organization, The American Dietetic Association. Clarifies professional values and ethical behavior.
RESTRICTIONS: Open only to Senior dietetics majors.

NTDT 404 Nutrition Seminar 1

Clarifies professional and ethical behavior of nutrition professionals. Roles and activities of relevant professional organizations. Career development, position application and interview.
RESTRICTIONS: Open to majors in Applied Nutrition and Nutritional Science.

NTDT 420 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: NTDT 400 (or NTDT 303) and BISC 406.

NTDT 421 Nutrition Research Methods 2

Discussion of and experience with selected methods and techniques in nutrition research.
PREREQ: NTDT 400 and a course in statistics.

NTDT 430 Nutrition Clinic Practicum 1-3

Experience in on-going activities of the University of Delaware Nutrition Clinic including client counseling, group presentations, nutrition education materials development and research activities.
PREREQ: NTDT 330.
RESTRICTIONS: Requires permission of instructor.

NTDT 440 Nutrition and Disease 4

Study of the metabolic deviations caused by various diseases and implications for the role of nutrition in therapy.
PREREQ: BISC 106 or BISC 406 and NTDT 400.

NTDT 445 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: NTDT 200.

NTDT 450 Coordinated Dietetics III 8

Clinical experience in therapeutic nutrition; nutritional care and management of patients undergoing various medical treatments; continuity of care during the following hospitalization; impact of nutritional care plan on living patterns of individual and family.
PREREQ: NTDT 332.
COREQ: NTDT 440.

NTDT 452 Topics in Human Nutrition 2

Current perspectives on the physiological functions of nutrients and other food constituents.
PREREQ: NTDT 400 and BISC 106, BISC 116 or BISC 406, and BISC 416.

NTDT 460 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: NTDT 400 and NTDT 321.

NTDT 464 Community Nutrition Field Experience 2

Direct client contact through delivery of nutritional services in community health maintenance and health care delivery facilities. First-hand experience with the nutritional management of clients in a community nutrition program.
PREREQ: NTDT 322 and NTDT 440.
COREQ: NTDT 460.

NTDT 466 Independent Study 1-6

NTDT 470 Coordinated Dietetics IV 6

Participation in nutritional components of community programs involved in health maintenance and health care delivery.
PREREQ: NTDT 450.
COREQ: NTDT 460.

NTDT 475 Transcultural Food Habits 5

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: NTDT 200 or NTDT 303.

NTDT 611 Advanced Nutrition 3

Metabolism and its relation to human nutrition; current literature; methods and techniques of nutrition research.
PREREQ: NTDT 400.

NTDT 615 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.

NTDT 620 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: NTDT 400 (or NTDT 303) and BISC 106 or BISC 406.

NTDT 621 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.

NTDT 624 Monogastric Nutrition 3

See ANSC 624 for course description.

NTDT 630 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 ANSC 630.
PREREQ: Junior-level course work in human or animal nutrition, biochemistry or biological sciences.

NTDT 645 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, nonschool and adult programs.
PREREQ: NTDT 200.

NTDT 652 Topics in Human Nutrition 2

Current perspectives on the physiological functions of nutrients and other food constituents.
PREREQ: NTDT 400, BISC 106/BISC 116 or BISC 406/BISC 416.

NTDT 654 Ruminant Nutrition and Metabolism 3

See ANSC 654 for course description.

NTDT 665 Seminar 1-3 PF

NTDT 668 Research 1-6

NTDT 675 Transcultural Food Habits 5

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: NTDT 200 or NTDT 303.
RESTRICTIONS: Only three credit hours may count toward graduation for majors.

NTDT 868 Research 1-6

NTDT 869 Master's Thesis 1-6

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: BISC 207, BISC 208, CHEM 105, CHEM 106, ENGL 110, MATH 114, SOCI 220-level or above.

COREQ: NURS 215.

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: BISC 207, BISC 208, CHEM 105, CHEM 106, ENGL 110, MATH 114, or above.

COREQ: NURS 205.

RESTRICTIONS: Open to nursing majors only.

NURS 305 Determinants of Wellness 10

Utilization of the nursing process to assist well clients of all ages in the maintenance and promotion of health. Biopsychosocial assessment of the well client within a family context and in relation to other systems of health care. Includes clinical experience.

PREREQ: NURS 205, NURS 215, MATH 114, ENGL 301, CHEM 106, IFST 201, BISC 371, BISC 406/BISC 416, PHYS 104, NTD 303, ANTH 100-level, and SOCI 200-level.

RESTRICTIONS: Requires 2.0 G.P.A.

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: ANTH 100-level, BISC 371, BISC 406, BISC 416, ENGL 301, IFST 201, NURS 205, 215, NTD 303, PHYS 104, and PSYC 201.

COREQ: NURS 312, NURS 314 and NURS 315.

RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 307 Restorative Nursing Practice I 10

Biopsychosocial stressors in health and illness with emphasis on the nursing process, the client's state disequilibrium, role of the nurse and therapeutic intervention. Includes clinical experience with individuals and groups.

PREREQ: NURS 305, NURS 312 and NURS 314.

RESTRICTIONS: Requires 2.0 G.P.A.

NURS 308 Restorative Nursing Practice I 4

Concepts/theories pertinent to promotion of optimal health of clients experiencing common and/or recurring health problems.

PREREQ: NURS 306, NURS 312, NURS 314 and NURS 315.

COREQ: NURS 317; NURS 318 or NURS 319; and NURS 332.

RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 312 Pathophysiology 3

Focuses on biological processes leading to alterations of body structure and functions. Emphasis on identification of etiology and pathogenesis of selected diseases.

PREREQ: ANTH 100-level, BISC 371, BISC 406, BISC 416, ENGL 301, IFST 201, NURS 205, NURS 215, NTD 303, PHYS 104 and PSYC 201.

COREQ: NURS 306, NURS 314 and NURS 315.

RESTRICTIONS: Open to nursing majors only.

NURS 314 Psychopathology 2

Delineates psychopathological processes across the life span. Emphasis on the etiology, manifestations and treatment options of selected psychopathological processes. Addresses current trends and issues in the mental health field.

PREREQ: ANTH 100-level, BISC 371, BISC 406, BISC 416, ENGL 301, IFST 201, NURS 205, NURS 215, NTD 303, PHYS 104 and PSYC 201.

COREQ: NURS 306, NURS 312 and NURS 315.

RESTRICTIONS: Open to nursing majors only.

NURS 315 Practicum I 4

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: ANTH 100-level, BISC 371, BISC 406, BISC 416, ENGL 301, IFST 201, NURS 205, NURS 215, NTD 303, PHYS 104 and PSYC 201.

COREQ: NURS 312, NURS 314, NURS 315 and NURS 306.

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: NURS 306, NURS 312, NURS 314 and NURS 315.

COREQ: NURS 308; NURS 318 or NURS 319; and NURS 332.

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: NURS 306, NURS 312, NURS 314 and NURS 315.

COREQ: NURS 308, NURS 317 and NURS 332.

RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 319 Practicum IV 3

Experiences for incorporation and application of selected concepts/theories underlying nursing care that promotes optimal health of adults with mental illness. Emphasizes assessment and planning steps of nursing process. Comprises 84 clinical hours.

PREREQ: NURS 306, NURS 312, NURS 314 and NURS 315.

COREQ: NURS 308, NURS 317 and NURS 332.

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: NURS 306, NURS 312, NURS 314 and NURS 315.

COREQ: NURS 308; NURS 317; NURS 318 or NURS 319.

RESTRICTIONS: Open to nursing majors only.

NURS 366 Independent Study 1-6

NURS 405 Introduction to Nursing Research 3

Introduction to nursing research methods basic to identification of researchable nursing problems and to evaluation of existing nursing research for consumership.

PREREQ: NURS 308; NURS 317; NURS 318 or NURS 319; and NURS 332.

COREQ: NURS 408; NURS 417; NURS 418 or NURS 419.

RESTRICTIONS: Open to nursing majors only.

NURS 407 Restorative Nursing Practice II 10

Individuals and families in biopsychosocial disequilibrium. Emphasis on proficiency in the nursing process. Expands on previously learned theories. Introduces management and patterns of care. Includes clinical experience.

PREREQ: NURS 307, NURS 314 and NURS 332.

RESTRICTIONS: Requires 2.0 G.P.A.

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: NURS 308; NURS 317; NURS 318 or NURS 319; and NURS 332.

COREQ: NURS 417; NURS 418 or NURS 419; and NURS 405.

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: NURS 405; NURS 408; NURS 417; NURS 418 or NURS 419.

COREQ: NURS 420.

RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 410 Professionalism in Nursing Practice 8

Research, current issues in nursing, management, including strategies of administration and complex organizational theory, and the concept of interdisciplinary collaboration of health care personnel as they relate to clients in varying stages of health and illness. Includes clinical experience.

PREREQ: NURS 322 and NURS 407.

RESTRICTIONS: Requires 2.0 G.P.A.

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: NURS 308; NURS 317; NURS 318 or NURS 319; and NURS 332.

COREQ: NURS 405; NURS 417; NURS 418 or NURS 419.

RESTRICTIONS: Open to nursing majors only. May be repeated for up to six credit hours.

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: NURS 308; NURS 317; NURS 318 or NURS 319; and NURS 332.

COREQ: NURS 408; NURS 418 or NURS 419; and NURS 405.

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: NURS 308; NURS 317; NURS 318 or NURS 319; and NURS 332.

COREQ: NURS 408, NURS 417 and NURS 405.

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: NURS 308; NURS 317; NURS 318 or NURS 319; NURS 332.

COREQ: NURS 408, NURS 417 and NURS 405.

RESTRICTIONS: Open to nursing majors only. Offered in Fall.

NURS 420 Practicum VIII 6

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: NURS 405; NURS 408; NURS 417; NURS 418 or NURS 419.

COREQ: NURS 409.

RESTRICTIONS: Open to nursing majors only. Offered in Spring.

NURS 431 Honors: Dying and the Hospice Alternative 1

Exploration of personal attitudes and philosophy of death and dying and predominant views of society—discussion of needs of persons involved in the dying experience with special attention to how hospice care meets those needs, as well as hospice development in modern British and U.S. health systems.

NURS 462 Physical Assessment of Adults 3

Introductory course in the physical assessment of adults for registered nurses to expand their skills in health assessment. All aspects of the physical examination of adults covered with limited clinical application.

RESTRICTIONS: Requires permission of instructor.

NURS 466 Independent Study 1-6

NURS 470 Wellness: Survival in Modern Society 3

Exploration of major issues in wellness care: holistic movements, stress, habit control, nutritional controversies, touch and massage, physical fitness and health maintenance organizations. Nursing roles emphasized in context of facilitation of wellness.

NURS 800 Health Assessment of the Aged 4

Knowledge and theory of biophysical aging and psychosocial development. Methods of logical clinical protocol in a systems approach to collect and arrange data as a baseline for nursing diagnoses.

PREREQ: NURS 812.

RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

NURS 801 Health Promotion and Restoration for the Aged 4

Knowledge, theory and nursing skills for health promotion, maintenance and restoration of abilities of aged individuals with functional losses complicated by psychosocial problems. Clinical experience with individuals and their families within a multidisciplinary health team approach.

PREREQ: NURS 800.

RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

NURS 802 Acute Care Nursing of the Aged 4

Synthesis of gerontological nursing theory with acute care nursing knowledge. Clinical practice includes comprehensive nursing of acutely ill, aged persons.

PREREQ: NURS 801

RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

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 this 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. May be cross-listed with CSCI 807 and/or PHIL 807.

RESTRICTIONS: Requires permission of instructor.

NURS 809 Health Behavior 3

Nursing and behavioral science theory and research provide a framework for the analysis of health-related behaviors across the life span. Emphasis on the psychological and social determinants of health-related behaviors of individuals. Examines the roles of the clinical nurse specialist and other health professionals in this context.

RESTRICTIONS: Requires RN and permission of instructor.

NURS 810 Research Methods in Nursing 3

Focuses on the relationship between nursing theories and research, the scientific method, research design and methodology and ways to implement research findings in nursing practice.

PREREQ: NURS 812.

RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

NURS 811 Concepts in Advanced Nursing Practice 2

Focuses on concepts relevant to advanced nursing practice across the life-span. Includes the impact of changing demographics, environmental influences and cultural determinants on delivery of health care. Emphasis on the responsibility of advanced practitioners for review of current health policies and legislation.

RESTRICTIONS: Requires BSN and permission of instructor.

NURS 812 Nursing Theories and Models 2

Examines the theoretical base of nursing as a discipline. The development of selected models and theories are analyzed with emphasis in relevance to nursing practice, education and research.

COREQ: Clinical nursing course.

RESTRICTIONS: Requires BSN and permission of instructor.

NURS 813 Advanced Nursing Roles in Health Care Delivery 2

Exploration of roles and responsibilities of nurses in advanced practice in clinical specialty and nursing management. Reviews issues related to change, education, consultation, power and evaluation of nursing systems and collaboration with multidisciplinary professions.

RESTRICTIONS: Requires BSN and 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 Organizational Theories and Nursing Administration 4

Introduces theories of organization, administration and management, their interaction with nursing theories and influence on management of health care organizations.

COREQ: NURS 812.

RESTRICTIONS: Requires BSN and permission of instructor.

NURS 817 Organizational Goals and Planning Strategies 4

Introduces the role of nurse manager and analysis of organizational systems. Includes identifying organizational needs, formulating goals and objectives and selecting appropriate strategies for goal attainment within ethical constraints of health care.

PREREQ: NURS 815.

RESTRICTIONS: Open to nursing majors only.

NURS 818 Nursing Management and Evaluation 4

Emphasizes the role of nurse managers in personnel development promoting research in clinical settings, and developing and implementing quality assurance programs and their implications for nursing care and, where appropriate, on health care.

PREREQ: NURS 815 and NURS 817.

RESTRICTIONS: Open to nursing majors only.

NURS 819 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 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

NURS 870 Medical-Surgical Nursing I 4

Explores the scientific basis for therapy in adult patients with cardiopulmonary or oncological nursing problems. Theory and clinical practice emphasize health assessment skills and therapeutic intervention.

PREREQ: NURS 812.

RESTRICTIONS: Also requires BISC 671 for oncology nursing students and BISC 675 for cardiopulmonary nursing students.

NURS 871 Medical-Surgical Nursing II 4

Theoretical and clinical investigations of cardiopulmonary or oncological nursing problems that require long-term therapy involving adult patients, families and groups. Emphasis on assessment, prevention, maintenance and rehabilitation.

PREREQ: NURS 870.

RESTRICTIONS: Requires permission of instructor.

NURS 872 Medical-Surgical Nursing III 4

Exploration of nursing theory as applied to patients with cardiopulmonary or with oncological nursing problems, and with complex physiological and psychosocial problems. Experiential learning focuses on the practice of the specialty with patients, families and groups in a variety of settings.

PREREQ: NURS 871.

RESTRICTIONS: Requires permission of instructor.

NURS 880 Nursing Assessment of Women, Children and Families 4

Integration of theories and concepts related to assessment of health and developmental status of women, children and their families.

PREREQ: NURS 812.

RESTRICTIONS: Open to nursing majors only. Requires permission of instructor.

NURS 881 Nursing of Women and Developing Families I 4

Biopsychosocial needs of women and developing families. Emphasis on nursing intervention to maintain or restore steady state in clients with health care needs of varying degrees of complexity.

PREREQ: NURS 880.

RESTRICTIONS: Requires permission of instructor.

NURS 882 Nursing of Women and Developing Families II 4

Biopsychosocial needs of women and developing families. Emphasis on nursing intervention to maintain or restore steady state in clients with health care needs of increased complexity.

PREREQ: NURS 881.

RESTRICTIONS: Requires permission of instructor.

Operations Research

ORES 601 Survey Operations Research I 3

Covers various deterministic mathematical programming methods (LP, integer dynamic nonlinear, goal) network models and Markov chain analysis.

PREREQ: Linear algebra.

ORES 602 Survey Operations Research II 3

Oriented towards developing analysis of dynamic production decision processes primarily within stochastic settings. Estimation of linear and nonlinear systems of equations along with transportation models.

PREREQ: Linear algebra.

ORES 650 Urban Transportation Systems 3

See CIEG 650 for course description.

ORES 690 Operations Research Seminar 0 PF

Seminars to be given by faculty and by visiting academia, industry and government persons. 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 queuing 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: MATH 529, STAT 601 or MATH 630.

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 queuing 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: MATH 529, STAT 601 or MATH 630.

ORES 806 Research Techniques and Procedures 3

See FREC 806 for course description.

ORES 810 International Agricultural Trade Special Topics 3

See FREC 810 for course description.

ORES 827 Advanced Production Economics 3

See FREC 827 for course description.

ORES 834 Seminar in Resource Economics 3

See FREC 834 for course description.

ORES 869 Master's Thesis 1-6

ORES 969 Doctoral Dissertation 1-12 PF

Physical Education

PHED 120 Physical Education 1

Introduces knowledge and skills in physical activity. The program is geared toward life sports and allows for selection.

PHED 121 Water Safety Instruction 2

Prepares students with the skills and knowledge to teach people to swim and be safe in and around water. Topics covered: basic water safety, swimmer strokes, advanced lifesaving skills, first aid, artificial resuscitation, teaching techniques, lesson plans, unit plans and practical teaching experience.

RESTRICTIONS: Requires current Red Cross Advanced Lifesaving Certificate.

PHED 124 Aerobic Instructor Training Certification 2

Provides the potential teacher with pertinent, current knowledge on aerobic dance, to allow them to design safe and effective programs. Emphasis on effective leadership skills.

RESTRICTIONS: Requires aerobic dance experience and permission of instructor.

PHED 141 Skills, Techniques and Knowledge of Outdoor Recreation/Bowling 1

Provides the opportunity to develop skills and techniques, learn methods and acquire knowledge of designated outdoor recreation skills. Bowling skills presented. Emphasis on developing readiness for presenting such activities in group settings.

PHED 142 Skills, Techniques and Knowledge of Beginning Swimming/Diving 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only in Spring and Fall.

PHED 143 Skills, Techniques and Knowledge of Gymnastics I 1

An elementary course in skills, techniques and knowledge in gymnastics activities including (for women) the balance beam, trampoline, uneven parallel bars, vaulting horse, tumbling and free exercise; and (for men) horizontal bar, side horse, parallel bars, rings, tumbling, trampoline and free exercise.

PHED 144 Skills, Techniques and Knowledge of Tennis and Volleyball 1

Provides the opportunity to develop skills and learn methods and techniques. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 150 Movement Education for Children 3

Introduction to the elements of movement; understanding and appreciation of basic movement as it applies to skillful use and development of the individual's body. Provides the opportunity for individual and group creativity.

RESTRICTIONS: Open to majors only in Fall and Spring.

PHED 214 Wellness: A Way of Life 3

Principles of personal and public health including present and future problems of environmental control. Includes health services, health education and healthy school environment.

RESTRICTIONS: Open to majors only in Fall.

PHED 215 Observation and Assisting in School 2 PF

Observation of classes in both the elementary and secondary schools. Primary emphasis on opportunity to assist the regular teacher in classroom and gymnasium activities.

RESTRICTIONS: Requires permission of department

PHED 216 Practicum in Teaching 1 PF

Practical teaching experience. Student is assigned to lifetime sports activity courses and assists in conducting the course.

RESTRICTIONS: Requires permission of department.

PHED 220 Anatomy and Physiology 3

Structure and function of the human body: skeletal, muscular, circulatory, respiratory, nervous, endocrine, digestive and urinary systems. A foundation course for all areas of physical education and athletics.

RESTRICTIONS: Open to majors only

PHED 223 Football and Men's Basketball Officiating 3

Detailed understanding of rules as they pertain to officiating procedures. Includes lectures, demonstrations, films and some practical experience. Prepares individuals for entrance to scholastic officiating organizations.

PHED 241 Skills, Techniques and Knowledge of Golf and Softball 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 242 Skills, Techniques and Knowledge of Lacrosse and Field Hockey 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 243 Skills, Techniques and Knowledge of Track and Field and Flag Football 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 244 Skills, Techniques and Knowledge of Soccer and Basketball 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 245 Techniques for Women's Lacrosse 1

Practical experience in advanced techniques and strategies of women's lacrosse.

RESTRICTIONS: Offered in Winter only.

PHED 246 Techniques for Men's Lacrosse 1

Practical experience in advanced techniques and strategies of men's lacrosse.

RESTRICTIONS: Offered in Winter only.

PHED 250 Motor Development 3

Pattern of motor development from infancy through adolescence. Motor performance, perceptual-motor development in children, assessment for motor problems, remedial activities, principles of motor learning and conditions that improve motor learning.

RESTRICTIONS: Open to majors only.

PHED 251 Skills, Techniques and Knowledge of Rhythms and Dance 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

PHED 252 Skills, Techniques and Knowledge of Archery, Badminton and Selected Activities 1

Provides the opportunity to develop skills and learn methods and techniques. Emphasis on developing readiness for presenting such activities in public school classes.

RESTRICTIONS: Open to majors only.

PHED 253 Skills, Techniques and Knowledge of Self Defense/Dynamic Fitness 1

Preparation of physical education teachers. Provides the opportunity to develop skills, learn methods and techniques and acquire knowledge of the above activities. Emphasis on developing readiness for presenting such activities in public school settings.

RESTRICTIONS: Open to majors only.

PHED 254 Skills, Techniques and Knowledge of Gymnastics II 1

An advanced-level course in skills, techniques and knowledge of apparatus and tumbling.

PREREQ: PHED 143.

PHED 268 Sports Business Planning 3

Teaches the basic procedures and problems involved in the planning and operation of a sports/fitness business.

PHED 276 Personal Computers in Health, Physical Education and Recreation 3

Focuses on the fundamental characteristics of microcomputer systems and their increasing importance in the physical education and recreation areas. Basic concepts of programming as well as an overview of existing software packages.

RESTRICTIONS: Open to majors only.

PHED 300 History, Philosophy and Principles of Health, Physical Education and Recreation 3

History of health, physical education and recreation; philosophies and principles of physical education; the application of basic beliefs in planning program and methods of teaching. Opportunity to develop a personal philosophy of physical education.

PHED 305 Fundamentals of Athletic Training 3

The organization and administration of an athletic training program and the prevention, diagnosis and treatment of athletic injuries, including physical therapy, taping and training room. First aid, safety measures and prevention of injuries.

PREREQ: PHED 220.

PHED 314 Methods and Materials in Health Education 3 PF

Emphasis on health education in the school curriculum. Curriculum content and organization of materials for instructional purposes represents the primary thrust.

PREREQ: PHED 214.

RESTRICTIONS: Requires completion of all skill class work, minimum 2.0 GPA (2.75 major GPA), and upper division clearance.

PHED 315 Methods and Materials in Drug Education 3

Presents methods and materials to be used in school drug education programs. Emphasis on basic information related to the drug problem. Outside resource people including former drug users will be involved in class presentations.

PHED 324 Measurement and Evaluation 3

Measurement and evaluation of physical skills and knowledge as related to physical education. Includes descriptive statistics, knowledge tests, grading, physical performance tests and tests of sports skills.

PREREQ: Three-credit math course.

RESTRICTIONS: Open to majors only.

PHED 342 Survey in Adaptive Physical Education and Recreation 3

Study of prevalent abnormalities found in a general population including causes, prevention, care and treatment. Methods of screening students for determination of these disabilities are presented as a laboratory experience.

RESTRICTIONS: Open to majors only.

PHED 354 Seminar in Fitness Management/ Recreation 1 PF

Explores internship opportunities in the fitness management field and completion of necessary paperwork for placement in an agency that will assist students in meeting career objectives.

RESTRICTIONS: Open to majors only.

PHED 355 Figure Skating Practicum I 3

A survey in figure skating science covering the basics of coaching and teaching including an in-depth review of the instructional and competitive programs of the Ice Skating International Association and U.S.F.S.A. Extensive study and work in the basic badge programs of the I.S.I.A. and U.S.F.S.A.

RESTRICTIONS: Open to figure skating science students only.

PHED 356 Figure Skating Practicum II 3

Concentration in the areas of pairs and ice dance with emphasis on teaching and coaching techniques related to the basic through intermediate levels with an analysis of progression and sequencing.

RESTRICTIONS: Open to figure skating science majors only.

PHED 360 Psychology of Coaching 1

Lectures involving the psychology of coaching team sports. Emphasis on information concerned with observing the principles of individual differences.

PHED 361 Coaching Volleyball 1

Study of the methods and skill techniques involved with coaching participants in the sport of volleyball. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 362 Coaching Baseball 1

A study of the methods and skill techniques involved with coaching the sport of baseball. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 363 Coaching Tennis 1

A study of the methods and skill techniques involved with coaching participants in the sport of tennis. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 365 Coaching Basketball 1

A study of the methods and skill techniques involved with coaching participants in the sport of basketball. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 366 Independent Study 1-6

PHED 368 Coaching Track and Field 1

A study of the methods and skill techniques involved with coaching participants in the sport of track and field. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 370 Practicum in Methods of Elementary Physical Education 3 PF

Emphasis on clinical experience activity in the public school setting. Considers organization and supervision of elementary physical education programs and includes curriculum planning, selection of materials and related teaching techniques.

RESTRICTIONS: Requires Junior status, upper division clearance, completion of all skill class work, and a 2.0 GPA (2.75 major GPA).

PHED 372 Coaching Swimming and Diving 1

A study of the methods and skill techniques involved with coaching participants in the sport of swimming and diving. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 373 Coaching Football 1

A study of the methods and skill techniques involved with coaching participants in the sport of football. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 374 Coaching Lacrosse 1

A study of the methods and skill techniques involved with coaching participants in the sport of lacrosse. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 375 Coaching Wrestling 1

A study of the methods and skill techniques involved with coaching participants in the sport of wrestling. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 376 Coaching Soccer 1

A study of the methods and skill techniques involved with coaching participants in the sport of soccer. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 377 Coaching Field Hockey 1

A study of the methods and skill techniques involved with coaching participants in the sport of field hockey. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 378 Coaching Softball 1

A study of the methods and skill techniques involved with coaching participants in the sport of softball. Emphasis on organizing and administering this activity in a school program.

RESTRICTIONS: Requires interscholastic or intercollegiate experience, and/or the skills/technique course.

PHED 380 Practicum in Methods of Secondary Physical Education 3 PF

Emphasis on clinical experience activity in the public school setting. Considers organization and supervision of secondary physical education programs and includes curriculum planning, selection of materials and related teaching techniques.

RESTRICTIONS: Requires Junior status, upper division clearance, completion of all skill class work and a 2.0 GPA (2.75 major GPA).

PHED 403 Practicum in Adapted Physical Education 3-9 PF

Experience working with special children in a physical education setting. Clinical experiences may include work with a particular group of disabled children (e.g. mentally retarded) or several different groups of disabled children (e.g. mentally retarded, visually or hearing impaired or orthopedically handicapped). Variable time involvement up to maximum of 14 weeks.

PREREQ: PHED 342.

RESTRICTIONS: Open to physical education majors only.

PHED 405 Program Development in Athletic Injury Rehabilitation 3

Students plan and implement comprehensive individualized rehabilitation programs including determination of therapeutic goals and objectives, selection of therapeutic exercises, methods of evaluating and recording rehabilitation progress, and development of criteria for progression and return to competition.

RESTRICTIONS: For students in the athletic training curriculum.

PHED 407 Prevention and Recognition of Athletic Injuries 3

Procedures for preventing, diagnosing, treating and rehabilitating athletic injuries. Emphasis on early detection of both the nature and extent of injury.

PREREQ: PHED 480 and PHED 481 or PHED 420.

PHED 409 Therapeutic Modalities 3

Provides both theory and clinical experience in the use of the most common types of therapeutic modalities utilized in sports medicine.

RESTRICTIONS: For students in the athletic training education curriculum.

PHED 412 The Black Athlete in American Sport 3

Examination of the socioeconomic and cultural influences on the sport participation of Black Americans in American sport.

PHED 419 Legal Issues in Sports Administration 3

Identifies contemporary legal issues in fitness and sport and their implications for the sports and fitness industry at both amateur and professional levels. Focuses on administrative, judicial and legislative action that would minimize abuses in sports and fitness, produce laws and regulations setting standards and guidelines to improve sport, and provide new directions for the sports and fitness industries.

PHED 420 Functional Human Anatomy 3

Anatomical individuality, functional significance and human performance interpretations involved through the consideration of muscular, skeletal and nervous systems. Laboratory experience emphasizes the meaning and significance of musculoskeletal movements and utilizes prosected human specimens, models, x-rays, dry biological materials and other aids.

PREREQ: PHED 220.

PHED 424 Sport Sociology 3

Studies the issues surrounding sport and its impact on society. Provokes thought and argument on critical issues in sport sociology relative to the interrelationship between sport and society.

PHED 425 Athletics and Sport Psychology 3

Introduces topics relevant to sport psychology and coaching. Material covered is applicable to specific situations that occur between athletes, coaches and sport-related incidents. Presents a survey of recent sport psychological techniques and experiments.

PHED 426 Biomechanics of Sport 4

Studies the scientific principles of biomechanics. Develops fundamental understanding of the mechanics of the human body at rest or in motion. Includes basic principles of statics and dynamics as applied to the quantitative analysis of selected activities in sport.

RESTRICTIONS: Open to majors only.

PHED 430 Physiology of Activity 3

Study of integration of the body systems in performance of exercise, work and sports activities. Performance of exercise activities by the human body under environment stress situations.

PREREQ: PHED 220.

COREQ: PHED 431 or PHED 433.

PHED 431 Physiology of Activity Laboratory 1

Laboratory experiences include the measurement of physiological parameters under exercise conditions.

COREQ: PHED 430.

PHED 432 Individualized Physical Fitness 3

Studies principles and guidelines needed to develop individualized physical fitness programs with reference to type of activities required. Considers intensity, duration and frequency of effort. Evaluates student fitness status. Reviews all aspects of laboratory and classroom assessment of physical fitness.

PREREQ: PHED 430.

RESTRICTIONS: Open to majors only.

PHED 433 Laboratory Practicum in Exercise Physiology 1

Scientific procedures for conducting basic applied research in exercise physiology. Topics: oxygen uptake testing, hydrostatic weighing to evaluate body composition, blood lactate and cholesterol analysis and strength assessment. Completion of a pilot research project for each major area to develop proficiency in equipment usage and related literature search.

RESTRICTIONS: Requires Junior or Senior status in physical education. Requires permission of instructor.

PHED 434 Exercise Test Technology 3

Emphasizes American College of Sports Medicine objectives for cardiac rehabilitation exercise technologist certificate. Basic electrocardiography, exercise physiology, stress test administration, medications, report preparations, program considerations and facilities development.

RESTRICTIONS: Open to majors only.

PHED 437 Principles of Sport Management 3

Concepts of developing, implementing and managing sports programs for schools and colleges.

RESTRICTIONS: Open to majors only.

PHED 438 Facilities Management in Health, Physical Education and Recreation 3

Planning of areas and facilities for physical education, athletics and recreation with emphasis on current trends and problems.

RESTRICTIONS: Open to majors only.

PHED 440 Strategies for Athletic Peak Performance 3

Presentation of methods and techniques for the mental preparation necessary to attain athletic peak performance. Provides experiential activities in the areas of relaxation, visual imagery, visual motor behavior rehearsal, hypnosis stress reduction and concentration techniques.

PHED 451 Exercise Testing/Prescription 3

Methods of evaluating cardiovascular function through graded exercise tests as well as principles of exercise prescription. Theoretical as well as practical covering of administrative aspects of testing, metabolic calculations, a variety of testing protocols, basic exercise physiology and exercise prescription.

PHED 455 Figure Skating Practicum III 3

Concentration on advanced teaching/coaching techniques related to the skill required in I.S.I.A. and U.S.F.S.A. levels with an analysis of progression and sequencing. Seminar sessions to include professional responsibilities, business practices, skating pedagogy, special programs and precision skating.

RESTRICTIONS: Open only to majors in the figure skating science degree program.

PHED 456 Figure Skating Practicum IV 3

Direct involvement in the teaching/coaching of beginner elite national and world competitors under the supervision of Ice Skating Development Center professional staff.

RESTRICTIONS: Open only to majors in the figure skating science degree program.

PHED 464 Internship in Fitness Management 9 PF

A practical learning experience in fitness management. Experiences may include, but are not limited to hospitals, rehabilitation centers, commercial fitness agencies and corporate fitness centers. Students complete approximately 450 hours over a 14-week period.

PREREQ: PHED 354.

PHED 466 Independent Study 1-6

PHED 468 Teaching Seminar in Health and Physical Education 3 PF

Provides an avenue of discussion for analyzing the student teaching experience. Focuses on contemporary topics of interest to preprofessionals.

COREQ: EDDV 400.

RESTRICTIONS: Open to majors only. Conducted in public school setting.

PHED 480 Practicum in Athletic Training I 3

Supervised work in athletic training to be conducted in the training room facilities. Three hours per week spent discussing detailed anatomy, mechanics, diagnosis, treatment, prevention and rehabilitation of specific injuries. Other emphasis on supervised practical work.

PREREQ: One course in each of the following areas: physiological anatomy, first aid and athletic injuries, biomechanics or kinesiology.

RESTRICTIONS: Requires permission of instructor.

PHED 481 Practicum in Athletic Training II 3

Extensive application of training methods in a setting of practical work supervised by the athletic training staff and University physicians.

PREREQ: PHED 480.

RESTRICTIONS: Requires permission of instructor.

PHED 485 Women in Sports 3

A contemporary view of women in the world of sports. Emphasis on biological, physiological, sociological, psychological, historical and legal aspects. May be cross-listed with WOMS 484.

PHED 486 Tension Control and Relaxation 3

Focuses on the phenomenon of stress and includes application of various techniques in a laboratory setting with emphasis on individual measurement, awareness and improvement of relaxation. Students learn tension reduction, relaxation techniques or the refinement of relaxation techniques.

PHED 601 Research Methods 3

Emphasis on procedures for designing experimental research studies including choice of subjects, group design, choice of proper instrumentation, statistical design, formulation of experimental group programs and technical writing for proposals and publication.

PHED 602 Elementary Computer Statistics 3

Overview of elementary statistics and their use in research. Emphasis on the use and interpretation of packaged computer routines (SPSS). Discusses experimental designs utilizing analysis of variance and other research procedures.

PHED 605 Program Development in Athletic Injury Rehabilitation 3

Students plan and implement comprehensive individualized rehabilitation programs including determination of therapeutic goals and objectives, selection of therapeutic exercises, methods of evaluating and recording rehabilitation progress and return to competition. Involves a series of case studies and planning/implementing a rehabilitation program for a specific injury.

RESTRICTIONS: For students in the athletic training curriculum.

PHED 608 Curriculum in Physical Education 3

Curriculum design content, foundations and related research topics as well as principles of supervision appropriate for the student teacher, cooperating teacher and/or the chairperson of a physical education department.

PHED 610 Seminar: Teaching Lifetime Activities 3

Concentration on five lifetime sports including archery, badminton, bowling, golf and tennis. Discusses methods of teaching the skill including proper progression, skill analysis, use of teaching aids and safety responsibilities. Presents an opportunity to upgrade individual proficiency level in each activity.

RESTRICTIONS: Open to graduate students only.

PHED 612 Mechanical Analysis of Sport Skills 3

A mechanical interpretation and analysis of human performance in sport based upon a critical review of current research. Practical demonstrations and exercises are used to further identify the important laws that govern motion of the human body. Stresses the relationship between anatomical structure and mechanical function.

PHED 619 Legal Issues in Sports Administration 3

Identifies contemporary legal issues in fitness and sport and their implications for the sports and fitness industry at both the amateur and professional levels. Focuses on administrative, judicial and legislative action that would minimize abuses in sports and fitness, produce laws and regulations setting standards and guidelines to improve sport, and provide new directions for the sports and fitness industries.

PHED 628 Photography in Sport 3

Discusses basic design and operation principles of photographic systems with emphasis on use and application in sport activities. Deals primarily with black/white film and color slides. Extensive darkroom experiences provided.

PHED 629 Sport Psychology Skills Training 3

Presents work in a field setting with University athletes and students. Emphasis on research and designing of workshops and lectures for University, high school and recreational teams and/or individual athletes in the areas of psychological skills training to improve individual and team performances.

PHED 635 Seminar in Teaching Physical Education 3

Major goal is educational instructional improvement in elementary and secondary settings. Students critique pedagogical research and study methods of systematic observation of instruction and analysis of effective teaching behavior. Examines pedagogical trends, current issues and coaching methods.

PHED 644 Outdoor Experiential Education for Teachers and Recreators 3

Focuses on development of a broad spectrum of curriculum materials and instructional aids to be utilized in outdoor education programs. Includes techniques in social studies, science, art, language arts, physical education, music and math. Examines the meaning, scope and value of outdoor education and the involvement of the outdoor education movement in schools in America. Investigates activities both in and around schools and in natural areas. May be cross-listed with EDDV 649.

PHED 650 Perceptual Motor Development 3

Analysis of perceptual motor concepts and theory. Emphasis on screening techniques utilized to identify perceptual motor difficulties in children and development of remediation programs.

PHED 664 Field Study in Physical Education and Sport 3

Affords an opportunity to apply information derived from the graduate course of study to a physical education or sport setting. Includes selecting, organizing, conducting, evaluating and presenting a seminar on a project, plus developing a professional portfolio.

PHED 665 Cardiovascular Assessment I 3

Designed to teach the fundamentals for administering the 12-lead and single-lead electrocardiograms and stress test protocols for individuals recovering from cardiovascular disease. Emphasis on determining rate, rhythm, axis, hypertrophy and infarction.

PHED 670 Critical Issues in Physical Education and Athletics 3

Focuses on three themes: Historical Perspective, Current Issues Facing Physical Education and Athletics, and Trends Toward the Future in Physical Education.

PHED 675 Cardiovascular Assessment II 3

Prepares the student to direct exercise programs in the rehabilitative setting. Addresses theoretical and practical aspects of exercise testing and prescription in addition to administrative issues of programs. Students design an exercise program for phase I, II or III cardiac rehabilitation.

PHED 800 Advanced Physiology of Exercise 3

Consists of three basic parts: a survey of completed research on the effects of exercise upon the human body as it specifically relates to physical education and athletics; instruction in the use of stress testing equipment; and completion of an independent research project.

PHED 803 Introduction to Laboratory Instruments 3

Introduction to the principles of operation of laboratory equipment common to the areas of exercise physiology and biomechanics. Includes theory of operation, environmental considerations and area of application of instruments. Laboratory involves hands-on use of equipment to collect data for faculty and student research projects.

PHED 807 Motor Learning 3

Evaluation and application of research literature concerned with motor learning as it relates to teaching elementary and secondary physical education. Laboratory work includes major research techniques used in motor learning. Research proposal required at completion of the course.

PHED 810 Biomechanics of Sports 3

The mechanics of human motion. Investigation into the action of forces on bodies during the performance of sport activities.

PREREQ: College algebra, trigonometry and calculus.

PHED 869 Master's Thesis 1-6

Philosophy

PHIL 100 Philosophies of Life 3

Survey of selected past and present moral 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 central problems in the major areas of historical and contemporary philosophic thought: ethics, theories of knowledge, the nature of reality, philosophy of religion and political philosophy.

PHIL 105 Clear 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 1-4

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.

PHIL 203 Ethics 3

Study of moral value, 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 table and the use of a system of natural deduction to prove the validity of deductive arguments.

PHIL 206 Introduction to Science, Technology and Society 3

See CCCC 206 for course description.

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.

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 WOMS 210 for course description.

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 WOMS 216.

PHIL 225 Science or Pseudoscience 3

Examination of claims and theories like astrology, biorhythms, parapsychology, ancient astronauts and the Bermuda triangle. Emphasis on methodology, patterns of reasoning and assumptions used to support such claims and theories and how they compare with those used in natural and social sciences. Topics include confirmation, explanation, causation, testing, scientific method, rationality and scope of science.

PHIL 226 Mind, ESP and Survival 3

An exploration of major philosophical conceptions of the relation of mind (soul) and brain. Implications for the mind from the literature of psychic research and immortality.

PHIL 241 Ethical and Moral Dimensions of Health Care 3

See CCCC 241 for course description.

PHIL 242 Philosophy of Education 3

Philosophical assumptions underlying competing approaches to educational goals, curricula, instruction, organization and administration. Case study approach; consideration of collegiate education and current issues. May be cross-listed with EDST 242.

PREREQ: PHIL 100, PHIL 101 and PHIL 102.

PHIL 244 Philosophy of Art 3

An introduction to main philosophic problems concerning art: the nature, evaluation and value of art.

PHIL 245 Ethical Issues in Scientific Research 3

See CCCC 245 for course description.

PHIL 246 Philosophical Perspectives of Medicine 3

See CCCC 246 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 CSCC 250.

PHIL 301 Ancient Philosophy 3

Beginnings of Western science and philosophy. The pre-Socratics, Sophists, Socrates, post-Socratic ethics, Plato, Aristotle, the Epicureans, Stoics, Skeptics and Neoplatonists.

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

Main trends: Francis Bacon and scientific empiricism; Thomas Hobbes and materialism, Descartes, Spinoza and Leibniz; Locke, Berkeley, Hume and Kant; and the Age of Enlightenment and its impact on theories of art and history.

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 BAMS 307 for course description.

PHIL 308 Justice and Equality 3

Theories of justice and rights. Constraints on liberty, the enforcement of morals, legal vs. moral responsibility, authority, disobedience and loyalty.

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 Syntheses: Neo-Confucianism. The Response to the West: Maoism and Modern Confucianism.

PHIL 313 Major Theological Traditions 3

Selected major theologians of decisive importance for the historical development of Christian thought and the relation of theology to philosophy and culture.

PHIL 317 American Philosophy 3

Classical American philosophers, including Emerson, Thoreau, Peirce, James and Dewey. Includes ethics, epistemology and social and political theory. May be cross-listed with AMST 317.

PHIL 320 Experience, Knowledge and Reality 3

An examination of some central issues in epistemology and metaphysics. The nature of minds and the world, and the nature and possible extent of our knowledge of both.

PHIL 322 Existentialism 3

Study of the origins and development of existential philosophy. Emphasis on the fundamental 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 324 The Philosophy of Love 3

Eros, agape, caritas, "passion-love," romantic love, fraternal love, friendship, Tristanism, Don Juanism, the forms serving to identify discrete life-styles, ages and cultures. Readings include Ortega and Gasset, Sartre, Santayana, Kierkegaard, Schopenhauer, Stendhal, Augustine, Plotinus and Plato.

PHIL 325 Dimensions of Personal Growth 3

Using eudaimonist ("self-actualization") presuppositions, seeks to uncover the intrinsic values, virtues and obligations of four stages of personal development: childhood, adolescence, maturation and old age.

PHIL 338 Philosophy and Gender 3

Critical examination of philosophical issues raised by feminism. May be cross-listed with WOMS 338.

RESTRICTIONS: May be repeated twice for degree credit when topics vary.

PHIL 341 Ethics of Engineering Profession 1

Introduction to cases involving engineers' moral responsibilities; emphasis on making reasonable ethical choices. May be cross-listed with CSCC 341.

PHIL 345 Philosophy of History 3

Nature and limits of our knowledge of the past, categories of explanation used by historians and the aim of historical inquiry. Speculation about the "meaning" of history and the structure of historical process.

PHIL 351 Mathematical Logic 3

Axiomatic quantified predicate calculus with identity; axiomatic set theory and number theory; and demonstration of metatheorems.

PREREQ: PHIL 205.

PHIL 360 Humanities Colloquium 3

See ARSC 360 for course description. May be cross-listed with ENGL 360.

PHIL 366 Independent Study 1-3

PHIL 390 Honors Colloquium 3

See ARSC 390 for description.

PHIL 392 Honors Colloquium 3

See ARSC 392 for course description.

PHIL 444 Medical Ethics 3

Seminar focuses on such topics as experimentation with human subjects, genetic engineering and the moral problems of health care. May be cross-listed with CSCC 444.

RESTRICTIONS: For students of philosophy and health professions.

PHIL 446 Philosophy of Law 3

The nature and function of law; relations among law, morality and society; the logic of legal reasoning; and analysis of fundamental concepts and institutions.

PHIL 454 Philosophy of Social Science 3

Critical examination of the central historical and contemporary questions about the concepts, methods, social structure and purposes of social science inquiry. May be cross-listed with ANTH 465 and/or SOCI 423.

PREREQ: A theory of methodology course in a social science, or an epistemology or philosophy of science course.

PHIL 463 Ethical Theory 3

Justification of ethical beliefs, alternative criteria of moral rightness and the meaning of moral concepts.

PREREQ: PHIL 202 or PHIL 203.

PHIL 465 Seminar: Philosophical Topics 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 647 Philosophy of Technology 3

Philosophical reflections on working with tools in the broadest sense; definitions; studies of processes, products and uses; and ethical, cultural and political critiques. Seminar format. May be cross-listed with CSCC 647, MALS 647 and/or URAF 647.

PHIL 807 Ethics and Health Care 3

See NURS 807 for course description.

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 101 Introduction to Physics 4

Survey of the fundamentals of physics, both classical and modern. No previous background in physics required.

RESTRICTIONS: Only one course among PHYS 101, PHYS 104, PHYS 201, PHYS 207 and SCEN 101 can count toward graduation.

PHYS 102 Introduction to Physics 4

Survey of the fundamentals of physics, both classical and modern. No previous background in physics required.

RESTRICTIONS: Only one course among PHYS 102, PHYS 202 and PHYS 208 can count toward graduation.

PHYS 104 Elementary Physics 3

Topics of current and general interest. Stresses applications of basic principles. Uses elementary algebra and scientific notation.

RESTRICTIONS: Only one course among PHYS 101, PHYS 104, PHYS 201, PHYS 207 and SCEN 101 can count toward graduation.

PHYS 133 Introduction to Astronomy 4

Comprehensive introduction to the constituents of the astronomical universe; how their existence, nature and the laws that govern them are revealed to us through discovery, observation and measurement. Portrays the earth in the solar system. Visual, telescopic and photographic observations included in laboratory.

PHYS 134 Introduction to Astronomy 4

Comprehensive introduction to the constituents of the astronomical universe; how their existence, nature and the laws that govern them are revealed to us through discovery, observation and measurement. Continuation of PHYS 133, enlarging the picture to include the more distant objects of our space environment. Visual, telescopic and photographic observations included in laboratory.

PREREQ: PHYS 133.

PHYS 139 Star and Constellation Identification 1

Familiarity with the sky, its changing aspects, constellations, mythology, bright stars and planets. Use of binoculars and small telescopes to find fainter "deep-sky" objects. Estimating directions and time from knowledge of the sky. Use of sky maps and coordinates.

PHYS 143 Energy Technology and Society 3

Definition and units; orders of magnitude of energy-related quantities. Forms of energy: mechanical, thermal, chemical, electrical and nuclear. Sources of utilizable energy: petroleum, coal, nuclear fission and fusion, solar, geothermal. Methods of conversion to useful forms.

PREREQ: College algebra.

PHYS 144 Concepts of the Universe 3

Early and modern concepts of the universe, the appearance of the sky, the planets and their motions; information in starlight, distances in the universe, intelligent life in the universe.

RESTRICTIONS: Not for credit to students who have taken PHYS 133 or PHYS 134.

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 201 General Physics 4

Fundamentals of physics, classical and modern. Includes more mathematics and problem work than PHYS 101 and PHYS 102.

PREREQ: MATH 115.

RESTRICTIONS: Recommended for pre-dentistry students. Only one course among PHYS 104, PHYS 201 and PHYS 207 and SCEN 101 can count toward graduation.

PHYS 202 General Physics 4

Fundamentals of physics, classical and modern. Includes more mathematics and problem work than PHYS 101 and PHYS 102.

PREREQ: MATH 115 and PHYS 201.

RESTRICTIONS: Recommended for pre-dentistry students. Only one course from among PHYS 102, PHYS 202 and PHYS 208 can count toward graduation.

PHYS 207 General Physics 4

Mechanics. A more mathematical treatment than PHYS 201-202 and more problem solving.

COREQ: MATH 242.

RESTRICTIONS: Only one course from among PHYS 101, PHYS 104, PHYS 207 and SCEN 101 can count toward graduation.

PHYS 208 General Physics 4

Electricity and magnetism. A more mathematical treatment than PHYS 201-202 and more problem solving.

PREREQ: PHYS 207.

COREQ: MATH 243.

PHYS 209 General Physics 3

Optics and modern physics including relativity and quantum mechanics. A more mathematical treatment than PHYS 201-202 and more problem solving.

PREREQ: PHYS 208.

PHYS 313 Physical Optics 4

Principles of optics; review of geometrical optics; interference, diffraction, polarization and the theory and use of optical instruments.

PREREQ: MATH 302.

PHYS 366 Independent Study 1-3

PHYS 419 Analytical Mechanics 3

Particle mechanics, conservation laws: motion under central forces, rigid body dynamics, small vibrations, continuum mechanics and Lagrange's equations.

COREQ: MATH 302.

PHYS 449 Introduction to Research 1-6

Undergraduate research on an assigned problem carried out under the supervision of the staff.

PHYS 466 Independent Study 1-3

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 603 Electricity and Magnetism 3

Electrostatics and magnetostatics, uniqueness theorems, dielectric and magnetic materials; Maxwell's equations; generation and propagation of electromagnetic waves.

PREREQ: PHYS 208 or PHYS 202.

COREQ: MATH 503 or MATH 601.

PHYS 604 Electricity and Magnetism 3

Electrostatics and magnetostatics, uniqueness theorems, dielectric and magnetic materials; Maxwell's equations; generation and propagation of electromagnetic waves.

PREREQ: PHYS 208 or PHYS 202, and PHYS 603.

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.

PREREQ: PHYS 620, MATH 302, and MATH 602.

PHYS 608 Methods of Mathematical Physics 3

Mathematical subjects commonly employed in physics with examples taken from physics. Complex variables and asymptotic analysis.

PREREQ: PHYS 620, MATH 302 and MATH 602.

PHYS 610 Quantum Mechanics 3

Wave-particle duality. The Schrodinger equation. One-dimensional problems. Spherically symmetric potentials. Orbital angular momentum. Applications including hydrogenic atoms.

PREREQ: PHYS 622.

PHYS 615 Applications of Integrated Circuits 2

Applications of linear and digital integrated circuits in physics laboratories, both teaching and research. Op amps, voltage regulators, timers, comparators, analog switches, oscillators, function generators, temperature transducers; AtoD, DtoA, gates, flip-flops, counters, decoders, drivers and digital displays.

PREREQ: PHYS 208.

RESTRICTIONS: Requires some familiarity with electronics.

PHYS 616 Kinetic Theory and Thermodynamics 3

Elements of the kinetic theory of gases, a treatment of thermodynamic principles and introduction to statistics.

PREREQ: MATH 243 and PHYS 209.

PHYS 620 Analytical Mechanics 3

Particle mechanics, conservation laws, motion under central forces, rigid body dynamics, small vibrations, continuum mechanics and Lagrange's equations.

PREREQ: MATH 302 and PHYS 419.

PHYS 621 Introduction to Modern Physics 0-0

PHYS 622 Introduction to Modern Physics 3

A comprehensive description and mathematical treatment of the fundamentals of modern electronic, atomic, molecular and nuclear physics.

PREREQ: PHYS 209, MATH 302 and PHYS 621.

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: PHYS 616 and PHYS 621.

PHYS 631 Acoustics 3

Vibrations of particles, strings and membranes; acoustic waves; radiation of sound; room acoustics; and acoustic measurements.

PREREQ: MATH 302.

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 phenomena of galactic and extragalactic astronomy.

PREREQ: MATH 302 plus 14 hours of physics.

PHYS 633 Stellar Astrophysics 3

Basic principles governing the construction of theoretical models of the atmospheres and interiors of stars. Stellar evolution. Computer calculation of stellar spectra and modelling of stellar interiors.

PREREQ: PHYS 632.

PHYS 638 Selected Topics in Physics 3

Treatment of a specialized subject, taken from the following list: low-temperature physics, advanced experimental physics in research areas active in the department, cosmology, elementary particles, lasers and Fourier optics and plasma physics.

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: PHYS 208.

PHYS 646 Instrumentation for Scientists 3

Electronic measurements and instrumentation with emphasis on applications in science. Amplification, noise, low-level signal recovery, lock-in amplifiers, digital signal averaging, frequency and time measurements, transducers, bridges, interfacing to laboratory computers and automation of experiments.

PREREQ: PHYS 208 and PHYS 645.

PHYS 647 Modern Physics Laboratory 3

Introduction to modern experimental methods and techniques. Consists of a variety of experiments for the study of the structural, transport, magnetic, optical and nuclear properties of matter. Covers basic experimental techniques involved in materials preparation, vacuum design and measurement, and temperature control and measurement.

PREREQ: PHYS 209 and PHYS 621.

PHYS 803 Solid State Physics 3

Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties of solids; and imperfections in crystals.

PREREQ: PHYS 624.

PHYS 804 Solid State Physics 3

Crystal structure; mechanical, thermodynamic, electrical, optical and magnetic properties of solids; and imperfections in crystals.

PREREQ: PHYS 803.

PHYS 809 Electromagnetic Theory 3

Review of statics; Maxwell's equations, physical optics and wave guides; relativistic particle and field dynamics; and radiation damping.

PREREQ: PHYS 604.

PHYS 810 Electromagnetic Theory 3

Review of statics; Maxwell's equations, physical optics and wave guides; relativistic particle and field dynamics; and radiation damping.

PREREQ: PHYS 604 and PHYS 809.

PHYS 811 Quantum Mechanics 3

Continuation of PHYS 610. Approximation methods. Introductory scattering theory. Spin matrix formulation of quantum mechanics. Applications to atoms, molecules, nuclei and crystals.

PREREQ: PHYS 607 and PHYS 610.

COREQ: PHYS 608.

PHYS 812 Quantum Mechanics 3

Continuation of PHYS 811. Approximation methods. Symmetries. Semi-classical radiation theory. Identical particles and many-particle wave functions. Collision theory. Applications to atoms, molecules, nuclei and crystals.

PREREQ: PHYS 811.

PHYS 813 Statistical Mechanics and Thermodynamics 3

Review of equilibrium thermodynamics and probability theory; kinetic theory including the Boltzmann equation and an introduction to fluid mechanics, Gibbsian ensemble theory in classical and quantum statistical mechanics, the ideal Bose and Fermi gases with elementary applications, the statistical aspects of light, electrical noise and irreversible thermodynamics.

PREREQ: PHYS 616.

PHYS 815 Theory of Relativity 2-3

Critique of the special theory introductory to the general theory; physical basis of the general theory; Einstein's field equations; problems of gravitational motion and radiation.

PREREQ: PHYS 809.

PHYS 817 Advanced Classical Dynamics 3

Theoretical treatment of classical dynamics.

PHYS 834 Galactic and Extragalactic Astrophysics 3

A theoretical and analytic treatment (contrasted with the largely phenomenological approach of PHYS 632) of non-stellar astrophysics, including cosmic rays, inter-stellar medium, atomic astrophysics, plasma astrophysics, galactic structure, active galaxies and quasars, and cosmology.

PREREQ: PHYS 632.

PHYS 838 Advanced Treatment of Selected Topics 3

Selected topics taken from the following list: molecular biophysics, theory of relativity, nuclear theory, elementary particles, magnetic resonance, quantum mechanics, applications of group theory in physics, and quantum electronics.

RESTRICTIONS: May be repeated for up to six credit hours when topics vary.

PHYS 839 Advanced Solid State Physics 3

Selected topics in solid state physics, taken from the following list: electronic conductivity, optical properties, crystal imperfections, magnetism, irreversible thermodynamics, mathematical methods, and band theory.

RESTRICTIONS: May be treated for up to nine 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 863 Theoretical Physics Seminar 1 PF

Lectures and discussions on specialized topics in theoretical physics.

PHYS 868 Research 1-9

PHYS 869 Master's Thesis 1-6

PHYS 969 Doctoral Dissertation 1-12 PF

Physical Therapy

PHYT 466 Independent Study 1-6

PHYT 600 Physical Therapy as a Profession 1

An introduction to the ethics, licensure laws and practice of physical therapy.

RESTRICTIONS: Open to MPT Program students only. Requires permission of instructor.

PHYT 601 Exercise Physiology: Treatment and Research 3

Discusses research on the effects of exercise on various patient populations. Emphasis on muscle, bone and connective tissue remodeling. Examines cardiopulmonary rehabilitation, isokinetic and isotonic theories and research.

RESTRICTIONS: Open to MPT Program students only.

PHYT 602 Patient Management I 3

An introduction to the theory and skills necessary for the physical therapy management of patients commonly seen in primary care facilities.

RESTRICTIONS: Open to MPT Program students only.

PHYT 603 Physical Agents 2

Introduces the physics, physiology and clinical applications of various physical agents. Students incorporate this new knowledge into patient care problems.

RESTRICTIONS: Open to MPT Program students only.

PHYT 604 Functional Anatomy and Biomechanics 3

Gives a description of normal and abnormal human movement. Emphasis on surface anatomy and evaluation procedures such as EMG and cinematography.

PREREQ: BISC 401 and PHYT 622.

PHYT 605 Clinical Internship 1-9 PF

Full- or part-time clinical experiences at various health care facilities.

RESTRICTIONS: Open to MPT Program students only with completion of prior professional coursework.

PHYT 606 Research Methods 3

The research process will be studied. Among the topics covered are: scientific method, experimental design, statistical procedures and technical writing.

RESTRICTIONS: Open to MPT Program students only.

PHYT 607 Electrophysiological Treatments and Evaluation 3

Emphasis on the physiological basis for the electrotherapeutic and electrophysiological evaluative procedures practiced in the physical therapy clinic.

RESTRICTIONS: Open to MPT Program students only.

PHYT 608 Musculoskeletal Evaluation and Treatment 3

In depth analysis of evaluation and treatment strategies of spinal and extremity joints, muscles and connective tissue. Emphasizes research on the physiological basis of traction, mobilization and exercise.

PREREQ: PHYT 604, PHYT 622 and PHYT 604.

PHYT 609 Neurophysiological Evaluation and Treatment 3

In depth analysis of evaluation and treatment strategies of neurologically involved patients. Emphasizes research on the physiological basis of traction, mobilization and exercise.

PREREQ: All first year MPT courses.

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.

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

Discusses various schools of orthopedic intervention.

PREREQ: All previous MPT courses.

PHYT 614 Sport Physical Therapy 3

Analyzes the various competencies required in the practice of sports physical therapy. Clinical skill acquired.

PREREQ: All previous MPT courses.

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.

PHYT 616 Pediatrics Seminar 3

Discusses selected problems encountered by the pediatric population. Studies the evaluation, treatment and research basis of these problems.

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: PHYT 602.

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 ob-gyn. Individualized clinical experiences may be arranged.

PREREQ: All previous MPT courses.

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: PHYT 622.

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.

PHYT 868 Research 1-9

PREREQ: All previous MPT courses.

RESTRICTIONS: Requires permission of instructor.

PHYT 869 Master's Thesis 1-6

PREREQ: All previous MPT courses.

RESTRICTIONS: Requires permission of instructor.

Plant Science

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: PLSC 101.

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 PLSC 401.

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 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: PLSC 101 or BISC 207.

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 to soil-plant relationships.

PREREQ: CHEM 101.

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: PLSC 133.

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: PLSC 133.

PLSC 213 Turf Establishment and Maintenance 3

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 ANSC 270 for course description.

PLSC 300 Principles of Animal and Plant Genetics 3

Introduction to the theory and application of genetics as related to the improvement of plants and animals. May be cross-listed with ANSC 300 and/or ENTO 300.

PREREQ: PLSC 101, or ANSC 101 and ANSC 134.

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: PLSC 201 or BISC 201.

PLSC 304 Soil and Plant Microbiology 4

Introduction to microorganisms in the plant and soil sciences: characterization of major microbial taxa; microorganisms in relation to soil productivity, environmental quality, and plant growth and disease; and basic laboratory techniques for studying microorganisms.

PREREQ: PLSC 201 and PLSC 204.

PLSC 305 Soil Fertility and Plant Nutrition 4

Basic principles of nutrient availability in the soil and physiological functions of nutrients in the plant. Application of principles to fertility management of agricultural crops.

PREREQ: CHEM 102 and PLSC 204.

PLSC 310 Animal and Plant Genetics Laboratory 1

Laboratory exercises concerning genetic concepts, methods and applications using various plant and animal systems. May be cross-listed with ANSC 310 and/or ENTO 310.

COREQ: PLSC 300.

PLSC 331 Landscape Construction I 4

Introduction to principles involved in contour grading, site drainage, design of landscape features and methods of construction related to landscaping.

PREREQ: PLSC 332.

PLSC 332 Basic Landscape Design I 4

Application of design principles to actual field problems, drafting and presenting techniques.

PREREQ: PLSC 212.

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: PLSC 151.

PLSC 402 Plant Taxonomy 3

Identification, classification and nomenclature of vascular plants, including sight recognition as well as use of alternative-statement keys. Emphasis on economic plant families of eastern U.S.

PREREQ: PLSC 201.

PLSC 403 Nursery and Garden Center Management 3

Production, maintenance and marketing of plants relative to the establishment and management of a nursery or garden center.

PREREQ: PLSC 101 or PLSC 151.

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 mechanics and regulation, water and solute utilization, nutrient translocation, photomorphogenesis and photoperiodism and growth hormones, considered at the fundamental level of operation.

PREREQ: PLSC 201 or BISC 208, and CHEM 213.

PLSC 411 Diagnostic Plant Pathology 2

Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control.

PREREQ: PLSC 303.

PLSC 412 Diagnostic Plant Pathology Laboratory 1-6

Diagnosis, epidemiology and control of diseases of specific crops.

PREREQ: PLSC 411.

COREQ: PLSC 411.

PLSC 413 Principles of Plant Disease Control 3

Principles of plant disease control by exclusion, eradication and resistance. Plant protection with emphasis on fungicides, bacteriocides, and nematocides and their use.

PREREQ: PLSC 303.

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: PLSC 101.

PLSC 417 Greenhouse Management 4

Greenhouse structures, environmental control, cultural techniques and general management practices in greenhouse operations. Laboratory exercises supplement lecture material.

PREREQ: PLSC 201 and PLSC 204.

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: PLSC 410.

COREQ: PLSC 410.

PLSC 422 Plant Propagation 3

Practical and physiological aspects of the propagation of economic plants including both sexual and asexual methods.

PREREQ: PLSC 201.

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: PLSC 331.

PLSC 450 Landscape Design II 3

Comprehensive solution of landscape problems. Field application of principles of construction and design.

PREREQ: PLSC 332.

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: PLSC 211 and PLSC 212.

PLSC 465 Seminar 1

Oral and written reports in one of the fields of plant science.

PLSC 466 Independent Study 1-6

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: PLSC 151.

PLSC 602 Physiological Plant Productivity 3

Plant growth spanning net dry matter assimilation, growth habit plasticity, and photosynthetic efficiency; yield components, dry matter partitioning, respiratory and other losses of dry matter. Constraints upon photosynthetic efficiency (light absorption, water/carbon dioxide exchange and nutritional stress). Mineral uptake efficiency. Yield potential and heterosis in crop plants.

PREREQ: PLSC 410.

PLSC 603 Soil Physics 3

See AGE6 603 for course description.

PLSC 605 Plant Breeding 3

Improvement of crops through the application of genetic principles to breeding methods.

PREREQ: ANSC 300 or PLSC 300 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: PLSC 204.

PLSC 607 Plant and Soil Water Relations 3

Environmental aspects, measurement and control of water flux and storage in the soil-plant-atmosphere continuum; and development and significance of plant water deficits.

PREREQ: PLSC 305 and PLSC 410.

PLSC 608 Soil Chemistry 3

Aspects of soil acidity and of soil colloids. Reactions of soil nitrogen, phosphorus, potassium and micronutrients. Electrochemistry of soil colloids including double layer theory, zero point of charge theory and ion exchange reactions. Kinetics and thermodynamics of exchange in pure and mixed soil systems.

PREREQ: CHEM 102 or CHEM 104 and PLSC 204.

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 2

Consideration of major pathogenic causes of economic losses of plants. Emphasis on principles of etiology, epiphytology, symptoms and control.

PREREQ: PLSC 303.

PLSC 612 Diagnostic Plant Pathology Laboratory 1-6

Diagnosis, epidemiology and control of diseases of specific crops.

PREREQ: PLSC 611.

PLSC 613 Principles of Plant Disease Control 3

Exclusion, eradication, resistance and protection with emphasis on fungicides, bacteriocides and nematocides and their use.

PREREQ: PLSC 303.

PLSC 615 Vascular Plant Anatomy 3

A developmental and comparative study of the cells, tissues and organs of vascular plants. Readings in the current anatomical literature.

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 associated 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: PLSC 410.

COREQ: PLSC 410.

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 650 Clay Mineralogy 3

See MAST 650 for course description.

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 grantsmanship, 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: PLSC 305 and PLSC 410.

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: ANSC 670 or BISC 653.

PLSC 810 Soil Physical Chemistry 3

Basic physical chemistry principles applied to heterogeneous soil systems including ionic distribution of the diffuse double layer, thermodynamics of cation exchange, theories of cation adsorption by soil constituents, anion exclusion, miscible displacement theory and aspects of equilibrium and kinetics.

PREREQ: PLSC 608.

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 823 Seminar: Principles of Plant Infection 3

The basic factors governing the development of plant infection by phytopathogenic organisms: 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, arboreta and horticultural institutions.

RESTRICTIONS: Requires enrollment in Longwood Ornamental Horticulture Program. Offered in Fall of odd-numbered years.

PLSC 832 Botanic Garden Management 1-4

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 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 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. Language laboratory as needed.

PORT 106 Brazilian Portuguese II – Elementary/Intermediate 4

Completion of basic Brazilian Portuguese. Increasing mastery of the basic skills of speaking, listening, reading and writing.

PREREQ: PORT 105.

RESTRICTIONS: Two or three years of high school Brazilian Portuguese acceptable in lieu of Prerequisite.

PORT 107 Brazilian Portuguese III – Intermediate 4

Review of grammar, continued practice in speaking and writing, and reading texts of average difficulty.

PREREQ: PORT 106.

RESTRICTIONS: Four years of high school Brazilian Portuguese acceptable in lieu of Prerequisite. Course satisfies the Arts and Science foreign language requirement.

Political Science

POSC 105 The American Political System 3

Constitutional principles, structure and functions of the political process in the United States.

POSC 106 Introduction to Political Science: Issues 3

Selected problems of politics drawn from comparative and international politics, American government and political theory.

RESTRICTIONS: Cannot be substituted for POSC 105.

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, environmental policy, social welfare policy, etc.) used to illustrate processes of agenda setting, 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 ASRC 260 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 not around particular historical periods 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 responsibilities 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 Public Choice 3

See ECON 306 for course description.

POSC 310 European Governments 3

Structure and process of British, French, West German and Soviet governments.

POSC 311 Politics of Developing Nations 3

Forces determining public policy among the emerging nations. Cross-national comparative analysis.

POSC 313 American Foreign Policy 3

The theory, policies and administration of the U.S. foreign policy.

POSC 314 Making United States Foreign Policy 3

Discusses the roles of the executive, foreign, defense and intelligence establishments in making American foreign policy. Also treats the impact of public opinion, interest groups and Congress.

POSC 320 Parties and Interest Groups 3

Organization and behavior of political parties and interest groups including structure, leadership, recruitment and decision making.

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

Provides 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?

POSC 323 Introduction to Women and Politics 3

Political-legal status of American women since the Revolution, and their participation in the political process. Women's present political-legal status, as illustrated through current issues such as reproductive rights, pay equity and the feminization of poverty. May be cross-listed with WOMS 323.

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 333 Communism, Fascism and Democracy 3

Ideology and environmental backgrounds. 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. Accents problems of economic growth, equality, freedom and self-realization, bureaucracy, representation, justice, brotherhood, the profit motive, social cohesion, nationalism and the international order.

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 BUAD 341 for course description.

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 ASRC 360 for course description.

POSC 365 Model United Nations 2

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 European Political Systems 3

Survey of East European political systems (Poland, Hungary, Czechoslovakia, East Germany, Romania, Yugoslavia, Bulgaria, and Albania) after World War II. Some regional topics addressed: workers' and peasants' problems, the Warsaw Pact, Comecon, and intra-regional party relations.

POSC 377 Arab-Israeli Politics 3

Development of the Arab-Israeli conflict analyzed from the Dreyfus 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 law as the political instrument used to regulate, control and promote behavior and deal with social problems.

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 ASRC 390 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 socio-political 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 United Nations and its related agencies; regional and other international organizations.

POSC 409 Contemporary Problems of World Politics 3

Critical areas of international politics.

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 overpopulation and socio-economic differences.

POSC 412 Foreign Policy of the Soviet Union 3

Principles, foreign policies and administration of the Soviet government.

POSC 413 Problems in American Government 3

Contemporary problems in American government and politics. May be cross-listed with WOMS 413.

POSC 414 Problems in American Foreign Policy 3

Contemporary problems in American foreign policy and policy making.

POSC 415 Force and World Politics 3

Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.

POSC 416 Transnational Relations and World Politics 3

Transnational political and economic phenomena; emphasis on political behavior of multinational corporations, international financial system; implications for world order.

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 429 East Asian Political Systems 3

Emphasis on China and Japan.

POSC 431 Latin American Politics: Countries 3

Contemporary political events in three Latin American nations. Comparisons of the actions and influence of the military, church, bureaucracies, political parties and guerrilla groups in three different Latin American settings: modern, transitional and traditional.

POSC 432 Political System of the Soviet Union 3

Structure and process of the political system of U.S.S.R.

POSC 433 African Political Systems 3

Structure, process and policies of the governments, south and north of the Sahara.

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, film and other literary works.

POSC 437 Democratic Theory 3

Definition and operation of democracy in contemporary society; elite-mass public interaction, representation, bureaucratic power, mass media and economic power as constraints on democratic theory. Emphasis on the American experience.

POSC 441 Problems of Western European Politics by Country 3

Intensive examination of European politics from the perspective of a specific country, e.g., Spain, England and France.

RESTRICTIONS: Offered only in conjunction with travel abroad programs.

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 Foreign Policy of China 3

Theory, policies and administration of Chinese foreign policy.

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 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 Politics 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 460 Humanities Colloquium 3

See ASRC 460 for course description.

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 delegates to the week-long simulation. May be cross-listed with EDST 465.

POSC 466 Independent Study 1-6**POSC 470 Senior Honors Seminar 3****POSC 477 Politics of the Arab World 3**

Arab politics surveyed from Morocco to Iraq.

POSC 604 International Law 3

See MAST 673 for course description.

POSC 612 Foreign Policy of the Soviet Union 3

Principles, foreign policies and administration of the Soviet government.

POSC 615 Force and World Politics 3

Interrelationship of military and foreign policy; military strategies, arms control and disarmament; and the American experience.

POSC 616 Transnational Relations and World Politics 3

Transnational political and economic phenomena; emphasis on political behavior of multinational corporations, international financial system; and implications for world order.

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 cross-listed with URAF 625.

POSC 627 Latin American Political Systems 3

Impact of social and economic change on the political processes.

POSC 632 Political System of the Soviet Union 3

Structure and process of the political system of U.S.S.R.

POSC 633 African Political Systems 3

Structure, process and policies of the governments of Africa, south and north of the Sahara.

POSC 639 Public Policy Issues and Administrative Law 3

See URAF 639 for course description.

POSC 640 International and Development Administration 3

The administration of development, especially in third world countries. Considers development a multi-dimensional process involving major changes in social structures, popular attitudes and local, national and international institutions, as well as in economic growth, the reduction of inequality and the eradication of absolute poverty. May be cross-listed with URAF 640.

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 643 Foreign Policy of Communist China 3

Theory, policies and administration of Communist Chinese foreign policy.

POSC 650 Problems of Latin American Politics 3

Current political issues in selected Latin American countries.

POSC 651 Communist Political Thought 3

Major theoretical ideas of Marxism-Leninism. Marx, Engels, Lenin, Stalin, Mao Tse-Tung and Castro examined for their contributions to Communist thought.

POSC 652 Topics in Political Theory 3

Focuses on selected topics in political theory, including Marxism, Liberalism and Contemporary Political Theory.

POSC 677 Politics of the Arab World 3

Arab politics surveyed from Morocco to Iraq.

POSC 679 Shipping and Port Policies 3

See MAST 679 for course description.

POSC 800 Seminar: Scope and Methods 3

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 cross-listed with URAF 803.

POSC 808 Seminar: American Political Institutions 3

POSC 810 Seminar: Comparative Government 3

POSC 812 Seminar: Topics in American Politics 3

Focuses on selected topics in American politics, including urban politics, judicial politics and political parties.

POSC 813 Seminar: American Foreign Policy 3

POSC 815 Public Management Statistics 3

See URAF 815 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 cross-listed with URAF 816.

POSC 817 Financing Alternatives in the Public Sector 3

See URAF 817 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 cross-listed with MAST 871 and/or URAF 818.

POSC 819 Management Decision Making 3

See URAF 819 for course description.

POSC 821 Technology and Society Seminar 3

See URAF 821 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 cross-listed with URAF 825.

POSC 830 Seminar: International Relations 3

POSC 831 Reading Seminar: International Relations 3

POSC 832 Public Financial Management 3

See URAF 832 for course description.

POSC 833 Seminar: Normative Political Theory 3

POSC 835 Organizational Theory and Administration 3

Examines the major theories of organization and considers their implications for strategies of administration. Focuses on selected aspects of organizational psychology and administrative behavior related to motivation and incentives, group dynamics and leadership and control. May be cross-listed with URAF 835.

POSC 837 Public Personnel Administration 3

See URAF 837 for course description.

POSC 838 Public Policy Analysis 3

Seminar covers an overview of the policy process and considers all topics central to an understanding of policy making in the United States. May be cross-listed with URAF 838.

POSC 868 Research 3

To be taken by M.A. students seeking to satisfy the program's research requirement through the research paper option.

POSC 869 Master's Thesis 1-6

POSC 969 Doctoral Dissertation 1-12 PF

Psychology

PSYC 201 General Psychology 3

A foundation course in the application of the scientific method to problems of human behavior and experience.

PSYC 202 Human Development and Educational Practice 3

See EDST 202 for course description.

PSYC 301 Personality 3

A survey of data and theories of human personality and affect.

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.

PSYC 304 Educational Psychology – Social Aspects 3

See EDST 304 for course description.

PSYC 305 Educational Psychology – Cognitive Aspects 3

See EDST 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.

PSYC 310 Sensation and Perception 3

Theories and experimental study of sensation and perception.

PREREQ: PSYC 309.

PSYC 312 Learning and Motivation 3

Experimental study of contemporary theories of learning and motivation.

PREREQ: 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 BISC 314.

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.

PSYC 322 Psychology of Adjustment 3

Problems of human adjustment with emphasis on causation and prevention of common maladjustments.

PSYC 324 Industrial Psychology 3

Psychological factors in selection, training, fatigue, morale, attitudes, accidents, and other aspects of worker efficiency.

PREREQ: PSYC 201.

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 301, PSYC 303 or PSYC 325.

PSYC 340 Cognition 3

Survey of major themes in human thought processes, concept formation, problem solving, creativity, language use and cognitive development.

PREREQ: PSYC 201 and PSYC 309.

PSYC 346 Psychology and the Law 3

See CRJU 346 for course description.

PSYC 347 The Jury: Guilty or Not Guilty 3

Observations of actual criminal and civil trials, mock jury deliberations of trials observed, and lectures on jury research, films, meetings with judges, prosecutors and defense attorneys.

COREQ: CRJU 347.

RESTRICTIONS: Requires permission of instructor.

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.

PSYC 366 Independent Study 1-6

PSYC 375 Adolescent Psychology 3

Analysis of the physiological, psychological, and social factors influencing psychological development from late childhood through adolescence.

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, causal attribution, deception, social attitudes and cross-cultural factors, with practical applications.

PSYC 405 Advanced Social Psychology 3

Contemporary theories of interpersonal behavior, dynamics of social groups and experimental methods for the study of social (communication and interaction) processes.

PREREQ: PSYC 303 and PSYC 309.

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 201 or PSYC 303.

PSYC 413 Addictive Behaviors 3

Emphasis on alcohol use: addresses the causes, effects, treatment and prevention of addictive behaviors. Topics include genetic and learning models of addiction, legal and social controls on substance use, medical and psychosocial treatments for addiction.

PSYC 414 Drugs and the Brain 3

Topics covered include basic mental illness, and drug abuse/addiction.

PREREQ: PSYC 314.

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 PSYC 310, PSYC 312, PSYC 314, or PSYC 340 as well as two of: PSYC 301, PSYC 303 or PSYC 325.

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 BAMS 432.

PREREQ: PSYC 201 or PSYC 303.

PSYC 417 Animal Behavior 3

Seminar on naturalistic and experimental investigations of species-typical behavior.

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.

PSYC 419 Psychology of Humor 3

Systematic survey of psychological theories of humor and the empirical basis for them. Undertakes the analysis of cognitive, motivational and social developmental bases of smiling and laughter.

PREREQ: PSYC 201, PSYC 303 or PSYC 325 or PSYC 301; and PSYC 309.

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: PSYC 303.

PSYC 425 Topics in Child Psychology 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: PSYC 325.

PSYC 444 The Psychology of Aesthetics 3

Psychological and psychobiological theories and empirical investigations of aesthetic experience.

PSYC 452 Language and Thought 3

A survey of research dealing with the nature of linguistic and cognitive structures, their development and their interaction.

PREREQ: PSYC 340.

PSYC 460 Assessment of Young Children 3

See IFST 452 for course description.

PSYC 462 Language Acquisition 4

See EDST 462 for course description.

PSYC 466 Independent Study 1-6

PSYC 468 Research 3-6

PSYC 605 Advanced Social Psychology 3

Contemporary theories of interpersonal behavior, dynamics of social groups and experimental methods for the study of social (communication and interaction) processes.

PREREQ: PSYC 303 and PSYC 309.

PSYC 606 Animal Behavior 3

Seminar on naturalistic and experimental investigations of species-typical behavior.

PSYC 608 Advanced Learning and Motivation 3

Experimental origins of the principles of learning with emphasis on the role of motivation in the learning process.

PREREQ: PSYC 310 and PSYC 312.

PSYC 613 Clinical Psychology 3

Introduction to clinical theories, research and practices. Diagnosis, classification and treatment of the behavior disorders.

PREREQ: PSYC 310 or PSYC 312.

PSYC 615 History of Cognitive Psychology 3

Review of major concepts in psychology and its philosophical roots that have determined the current theories and models of cognition.

PSYC 624 Industrial Social Psychology 3

Social psychology applied to problems of productivity, satisfaction, communication and organization.

PREREQ: PSYC 303.

PSYC 626 Neuroscience I 4

See BISC 626 for course description.

PSYC 627 Neuroscience II 4

See BISC 627 for course description.

PSYC 639 Psychology of Intergroup Relations 3

Prejudice, discrimination, minorities and assimilations.

PREREQ: PSYC 303.

PSYC 640 Text Comprehension 3

Survey of recent theoretical and experimental work being done in the area of text comprehension. Based on primary sources, addresses such topics as the effects of prior knowledge on processing, semantic priming, question answering and hypertext.

RESTRICTIONS: Requires permission of instructor.

PSYC 641 Visual Cognition 3

Reviews current research findings on how biological systems process visual information. Topics include basic visual processes, object recognition, spatial attention, visual search, visual memory (including imagery) and reading. Considers models derived from cognitive psychology, machine vision and neuroscience.

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 interrelated mental systems. Critically evaluates research on human memory and representation within the context of major cognitive models.

RESTRICTIONS: Requires permission of instructor.

PSYC 650 Cognitive Neuroscience 3

Examines neurophysiological basis for a variety of cognitive processes such as object recognition, selective attention, visual imagery, memory and language. Topics include neural networks, effects of brain damage and neural imaging techniques, such as Pet Scan and event-related brain potentials.

RESTRICTIONS: Requires permission of instructor.

PSYC 651 Controversies in Cognitive Psychology 3

Based on empirical research, students critically evaluate selected models of visual perception, attention and human memory. Opposing theoretical perspectives chosen to highlight the controversial areas of cognitive theory.

RESTRICTIONS: Requires permission of instructor.

PSYC 654 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: PSYC 309.

RESTRICTIONS: Requires consent of instructor.

PSYC 665 Using Tests in Counseling 3

See EDDV 675 for course description.

PSYC 668 Research 1-6

PSYC 675 Language Acquisition 4

See EDST 675 for course description.

PSYC 692 Social Skills Training for Children 3

See EDST 692 for course description.

PSYC 803 Emotions in Human Development 3

The nature of emotions, their relation to cognition and action and their role in mother-infant interaction, attachment, temperament, personality development, psychopathology and psychotherapy.

PSYC 804 Seminar in Human Development 3

Selected research literature in developmental psychology. May be cross-listed with EDST 837.

RESTRICTIONS: Requires permission of instructor.

PSYC 805 Theories in Social Psychology 3

A comprehensive examination of the dominant theories and associated research in social psychology.

RESTRICTIONS: Requires permission of instructor.

PSYC 806 Psychobiology 3

The structure and function of the nervous system and the neural mechanisms underlying sensory and motor processes and arousal, sleep, emotions, motivation, learning and memory.

RESTRICTIONS: Requires permission of instructor.

PSYC 808 Clinical Neuropsychology 3

Presents an overview of the neuroanatomical and biochemical bases of normal and abnormal behavior, the essentials of the neurological examination, a survey of neuropsychological assessment and an examination of several current topics.

PSYC 809 Research Design 3

An overview of methodological issues in the conduct of psychological research, including correlational, experimental, and quasi-experimental studies. Special emphasis on clinical and personality research.

PSYC 810 Information Processing 3

Theories of information processing and psychophysics.

PSYC 811 Sensory Processes 3

Structure and function of the sense organs, with emphasis on research techniques and methodology.

PREREQ: PSYC 627.

PSYC 814 Research Methods in Social Psychology 3

Strategies and techniques; and critical analysis of design.

PSYC 815 Theory and Research in Group Behavior 3

Empirical findings and major theories of group behavior. Emphasis on research methodology.

PSYC 817 Individual Intelligence Testing 3

See EDST 817 for course description.

PSYC 819 Psychotherapy I 3

Survey of theories, schools and techniques of psychotherapy and critical review of relevant 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. statistical prediction.

PSYC 824 Community Mental Health 3

The community's role in contributing to mental illness and the mode and feasibility of organizing community mental health agencies into a concerted preventive mental hygiene effort. Focuses on the Greater Wilmington community.

PSYC 825 Group Psychotherapy 3

Theories and applications of group psychotherapeutic practices including role playing and psychodrama. Review of relevant research and evaluative studies.

PSYC 827 Advanced Psychotherapy II 3

Schools, theories and techniques of psychotherapy including research on psychotherapy and review of evaluative studies. Supervised practice.

PREREQ: PSYC 819.

PSYC 829 Advanced Psychopathology 3

Nosology and etiology of the behavior disorders of non-organic origin. Theories of psychopathology, including various modes of conceptualizing psychopathology, i.e., medical vs. behavioral and psychosocial models. Reliability and validity of psychodiagnostics; and relevant research and problems of experimental clinical research with institutionalized populations.

PSYC 833 Seminar in Emotions 3

The theories and methods of measuring emotions, as states or traits of humans. Describes and demonstrates a range of methods, including rating, checklist, questionnaire and physiological ones.

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 PSYC 834.

PSYC 836 Supervised Practice in Clinical Psychology III 1-3 PF

Continuation of PSYC 834 and PSYC 835.

PREREQ: PSYC 834 and PSYC 835.

PSYC 837 Supervised Practice in Clinical Psychology IV 1-3 PF

Continuation of PSYC 834, PSYC 835 and PSYC 836.

PREREQ: PSYC 836.

PSYC 840 Advanced Personality Study 3

Theories of personality and motivation, current research in personality and motivation, relationship to psychopathology, normal adjustment and psychotherapy.

RESTRICTIONS: Requires permission of instructor.

PSYC 845 Childhood Psychopathology 3

See EDST 850 for course description.

PSYC 850 Seminar in Memory 3

Theories of information storage and retrieval.

RESTRICTIONS: Requires permission of instructor.

PSYC 851 Seminar in Perception 3

Major experimental problems and theories: core-context, configuration, topological, association and others.

PSYC 852 Seminar in Personality 3

Description and measurement of personality; comprehensive theories of personality; and methods of experimental investigation.

PSYC 853 Seminar in Learning 3

Current theories of learning; and emphasis on contemporary experimental literature.

PSYC 854 Seminar in Communications 3

Syntactic, semantic, and pragmatic phenomena. Experimental study of communication processes with special attention to nonverbal aspects of interpersonal interaction.

RESTRICTIONS: Requires permission of instructor.

PSYC 855 Seminar in Attitude Theory and Measurement 3

Analysis of structure, development and change in social attitudes. Emphasis on research methodology.

PREREQ: PSYC 805.

RESTRICTIONS: Requires consent of instructor.

PSYC 856 Seminar in Cognitive Processes 3

Consideration of major theories and empirical research in both individual and group problem solving and decision making.

PSYC 858 Seminar in Visual Processes 3

Survey of structure and function in the visual system with particular emphasis on the nature of light and stimulus detection as well as integration and transfer of the neural code.

RESTRICTIONS: Requires permission of instructor.

PSYC 859 Seminar in Cooperation and Competition 3

Study of negotiation, bargaining, risk taking and cooperation, in small and large groups.

RESTRICTIONS: Requires permission of instructor.

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: STAT 201 or PSYC 309, 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: STAT 201 or PSYC 309, and four courses in psychology.

PSYC 863 Seminar: Child Psychology 3

Advanced treatment of the experimental literature in child psychology as it relates to the issue of the "cognitive" vs. "motivational" approach to child development.

PREREQ: PSYC 607.

PSYC 868 Research 1-6

PSYC 869 Master's Thesis 1-6

RESTRICTIONS: Requires department permission.

PSYC 871 Proseminar I 1

Consists of a critical review of major models and methods in cognitive psychology.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 872 Proseminar II 1

Consists of a critical review of major models and methods in animal learning.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 873 Proseminar III 1

Consists of a critical review of major models and methods in biopsychology.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 874 Proseminar IV 1

Consists of a critical review of major models and methods in developmental psychology.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 875 Proseminar V 1

Consists of a critical review of major models and methods in social psychology.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 876 Proseminar VI 1

Consists of a critical review of major models and methods in clinical psychology.

RESTRICTIONS: Open to psychology graduate students only.

PSYC 969 Doctoral Dissertation 1-12 PF

Recreation and Park Administration

RPAD 105 Foundations of Recreation and Leisure Study 3

Study of the history, theory and philosophy of recreation and leisure services. Nature of the play experience, influence of leisure on society and a survey of the range of leisure services in the public, private, voluntary, military and commercial sectors.

RPAD 164 Practicum in Recreation and Parks 3 PF

Offers an opportunity to gain initial experience with a leisure service agency. Much of the laboratory time devoted to observing and/or assisting in leisure programs, and visiting other leisure service agencies.

RESTRICTIONS: For Freshmen or Sophomores.

RPAD 245 Introduction to Commercial Recreation Services 3

Focuses on the establishment, organization, management and marketing of various commercial recreation services. Areas addressed include travel and tourism, entertainment services, leisure services in the outdoor environment, hospitality/food services and retail outlets.

RPAD 260 Leisure Service Programming 3

An understanding of the program fields in relation to programming principles, objectives, structural organization and program evaluation. Purposes and values of a comprehensive range of recreation offerings and considerations necessary to provide a broad range of activities to all segments of the population.

PREREQ: RPAD 105 and RPAD 270.

RESTRICTIONS: Open to P.E. majors only.

RPAD 270 Recreation Leadership 3

An understanding of the dynamics of group interaction and the theories, principles and practices of leadership. Review of research in leadership and group dynamics. Study of and practical experience with techniques and methods working with individuals and groups in the recreation setting. Includes 15 hours of approved practical experience.

PREREQ: RPAD 105.

RESTRICTIONS: Open to P.E. majors only.

RPAD 310 Safety, First Aid and Emergency Care 3

Practical approach to first aid, safety, family health and prevention. Topics include basic concepts, needs, purposes, individual skills and legal implications.

RESTRICTIONS: Requires permission of instructor. Open to P.E. majors only.

RPAD 318 Special Recreation 3

Emphasis on the delivery and value of special recreation participation opportunities for members of special population groups, and particularly by persons with disabilities.

RPAD 341 Principles of Outdoor Recreation 3

Presents an orientation to the field of outdoor recreation. Attention given to heritage, trends, resources, economics, management approaches, ecological and educational goals and ethics toward an outdoor natural environment. Laboratory section involves participation and skill development in a variety of outdoor recreation activities.

RPAD 366 Independent Study 1-3

RPAD 370 Outdoor Adventure Leadership 3

Introduces recreation leadership in outdoor adventure activities. Attention directed toward conceptual and technical aspects of adventure programs.

RPAD 404 Organization, Administration, Recreation and Leisure Service 3

Study of administrative practices in recreation and parks including legal aspects, principles of planning and operation of parks and facilities, financial and business procedures, public relations, personnel practices and evaluations.

PREREQ: RPAD 105, RPAD 260, and RPAD 270.

RPAD 450 Facility and Park Management 3

Study of the principles and procedures involved in planning for parks and recreation resources, land acquisition and utilization, maintenance of park and recreation areas, facilities and equipment.

PREREQ: RPAD 105 and RPAD 270.

RPAD 451 Aquatic Management 3

Equips individuals with the knowledge, techniques and skills required to operate an aquatic facility as manager or director.

RPAD 464 Internship in Recreation 9 PF

Full semester, full-time experience. Students spend up to 450 hours in an agency that will assist them in meeting career objectives.

PREREQ: PHED 354.

RPAD 466 Independent Study 3

Russian

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. Language laboratory as needed.

RUSS 106 Russian II - Elementary/Intermediate 4

Completion of basic Russian. Increasing mastery of the basic skills of speaking, listening, reading and writing.

PREREQ: RUSS 105.

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: RUSS 106.

RESTRICTIONS: Four years of high school Russian acceptable in lieu of Prereq. Satisfies the Arts and Science foreign language requirement.

RUSS 203 Russian Grammar Review 3

Systematic review of elementary and intermediate Russian grammar, study of complex sentence structure and idioms. Some conversational practice.

PREREQ: RUSS 107.

RUSS 205 Russian Conversation 3

Practical use of the language. Emphasis on topics drawn from contemporary Russian life and literature.

PREREQ: RUSS 107.

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: RUSS 107.

RUSS 305 Russian Conversation and Composition 3

Discussion of current cultural, social and political topics in the Soviet Union. 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: RUSS 211.

RUSS 312 Introduction to Russian Literature II 3

Masterpieces of poetry, narrative prose and drama from the 20th century.

PREREQ: RUSS 211.

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: RUSS 211.

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 constructions, 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.

Science

SCEN 101 Physical Science 3-4

The structure, processes and concepts of the physical world.

RESTRICTIONS: Requires high school algebra. For non-science students with no physics or chemistry background. Not for physics or chemistry major credit. Only one course from among SCEN 101, PHYS 101, PHYS 104, PHYS 201 or PHYS 207 can count toward graduation.

SCEN 102 Physical Science 3-4

The structure, processes and concepts of the physical world.

RESTRICTIONS: Requires high school algebra. For non-science students with no physics or chemistry background. Not for physics or chemistry major credit.

SCEN 391 Secondary Science Curriculum 3

Content, organization, levels and design of curriculum in secondary-school programs in biology, chemistry, earth science, general science, physical science and physics. Design of a science course; planning major units.

RESTRICTIONS: Must precede SCEN 491.

SCEN 491 Teaching Science in Secondary Schools 4

Techniques, approaches and preparation for teaching science in high school and middle school. Laboratory meets one full morning per week in local high schools and middle schools for observation and initial teaching.

COREQ: EDST 302.

SCEN 492 Student Teaching Seminar: Secondary Science 1 PF

Methods, techniques and problems in student teaching of science in secondary schools, and their solutions. Management, and teaching for understanding.

COREQ: EDDV 400.

Sociology

SOCI 201 Introduction to Sociology 3

Principles of sociology.

SOCI 202 Social Deviance 3

Major forms of deviant behavior and the varied approaches to analysis.

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. May be cross-listed with BAMS 204.

SOCI 208 Work in America 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 WOMS 211 for course description.

SOCI 242 Society and the Health Professions 3

See CSCI 242 for course description.

SOCI 243 Society, Politics and Health Care 3

See CSCI 243 for course description.

SOCI 258 Sociological Foundations of Education 3

See EDST 258 for course description.

SOCI 298 Race, Ethnicity and Culture 1 PF

See WOMS 298 for course description.

SOCI 299 Research on Women 1 PF

See WOMS 299 for course description.

SOCI 301 Introduction of Sociological Research 3

Survey of research methods and data analysis employed in sociology.

PREREQ: SOCI 201.

RESTRICTIONS: Strongly recommended - Junior status and 12 social science credits.

SOCI 303 Juvenile Delinquency 3

Delinquency as a form of socially deviant behavior; definition of the extent of limitations of statistics, theories of causation, and the delinquent subculture; prevention and treatment. May be cross-listed with CRJU 303.

PREREQ: SOCI 201 or SOCI 209.

SOCI 304 Criminology 3

The nature, kinds and causes of crime. Criminal liability, criminal careers and organized racketeering. May be cross-listed with CRJU 304.

PREREQ: SOCI 201 or SOCI 202 or SOCI 209.

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: SOCI 201, SOCI 203 or PSYC 201.

SOCI 307 Sociology of Sex and Gender 3

Gender relations in society, including sex-role socialization; gender stratification; gender relations in the family, the workplace and other social institutions; and feminism and social change. May be cross-listed with WOMS 307.

PREREQ: SOCI 201 or SOCI 203.

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: SOCI 201 or SOCI 202 or SOCI 203 or SOCI 209.

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 of health), and health service patterns. May be cross-listed with CSCI 310.

PREREQ: SOCI 201.

SOCI 311 Hospitals 3

Hospitals, asylums, 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 CSCI 311.

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: SOC 1201.

SOCI 317 Women in American Society 3

The development of social criticism and its implications for feminist issues. Contributions of major sociological theorists to understanding the status of women in American society. May be cross-listed with WOMS 317.

PREREQ: SOCI 201.

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: SOCI 201 or SOCI 203 or PSYC 201 or POSC 105.

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: SOCI 201.

SOCI 327 Sociology of Organizations 3

Business enterprises, the military, governmental bureaus 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: SOCI 201.

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 CRJU 330.

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 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 CRJU 345.

SOCI 346 Sociology of Aging 3

Empirical and theoretical investigation of the aging process.

PREREQ: SOCI 201 or SOCI 202 or SOCI 203 or PSYC 201.

SOCI 348 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 CRJU 348.

PREREQ: SOCI 201.

SOCI 355 Computers, Ethics and Society 3

See CSCI 355 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: SOCI 201.

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 BAMS 361.

PREREQ: SOCI 201.

SOCI 362 Sociology of Mass Communication 3

Impact of mass media - television, film, radio and press - upon social attitudes, values and behavior. Problems of audience feedback, the media in social crisis and issues of control.

PREREQ: SOCI 201.

SOCI 366 Independent Study 1-3

SOCI 376 American Social Character 3

Nature of social character in America, particularly as influenced by recent socio-cultural change. Dominant and variant systems of beliefs, ideologies, values, motivations, psychodynamics, personality types and social behavior.

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.

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: SOCI 204.

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.

PREREQ: SOCI 309, SOCI 310.

SOCI 414 Data Analysis 3

Methods of analyzing data in sociological research focusing on multivariate approaches.

PREREQ: SOCI 301.

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 BAMS 415 and/or WOMS 415.

SOCI 423 Philosophy of Social Science 3

See PHIL 454 for course description.

SOCI 428 Corporate Crime 3

Nature and causes of the deviant behaviors and crimes of large organizations. How organizations act, are accused of deviance and defend themselves in cases such as price-fixing, sale of unsafe drugs and illegal spying. May be cross-listed with CRJU 428.

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: SOCI 341.

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 CRJU 448.

SOCI 450 Political Sociology 3

Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behavior.

PREREQ: SOCI 201.

SOCI 455 The Ecology of Crime 3

See CRJU 455 for course description.

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 CRJU 456.

PREREQ: SOCI 201.

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. Analyzes 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 GEOG 460, IFST 460 and/or WOMS 460.

SOCI 466 Independent Study 1-3**SOCI 495 Field Experience in Criminal Justice 4 PF**

See CRJU 495 for course description.

SOCI 604 Social Organization: Urban Community 3

Conditions underlying urban residential patterns and the consequences of these patterns for local community activities.

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 SOCI 605. Special emphasis on epistemological issues, methodological concerns central to the social sciences and non-positivistic 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. May be cross-listed with WOMS 607.

SOCI 609 Social Stratification 3

Reviews major theoretical and empirical work in social stratification.

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 19th century.

SOCI 613 Research and Social Theory 3

Focuses on the relations between theory and method in social research.

SOCI 614 Data Analysis 3

Methods of analyzing data in sociological research focusing on multivariate approaches.

PREREQ: SOCI 605

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 626 Sociology of Organizations 3

Development of theories of organizations; systems of authority and power, communication, reward and penalty; dynamics of conflict and accommodation between and within organizations; problems of induction, placement, coordination and succession within organizations.

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 650 Political Sociology 3

Analysis of political organization and action, including evaluation of major approaches. Case studies of political structures and behavior.

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 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 670 Advanced Philosophical Topics 3

See PHIL 670 for course description.

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**SOCI 836 Seminar in Criminal and Delinquent Behavior 3****SOCI 869 Master's Thesis 1-6****SOCI 969 Doctoral Dissertation 1-12 PF**

Spanish

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. Language laboratory work as needed.

SPAN 102 Elementary Spanish II 3

Completion of basic Spanish.

PREREQ: SPAN 101 or SPAN 105.

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. Language laboratory as needed.

SPAN 106 Spanish II – Elementary/Intermediate 4

Completion of basic Spanish. Increasing mastery of the basic skills of speaking, listening, reading and writing.

PREREQ: SPAN 105.

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: SPAN 106.

RESTRICTIONS: Four years of high school Spanish acceptable in lieu of Prereq. Satisfies the Arts and Science foreign language requirement.

SPAN 111 Intermediate Spanish I 3

Review of grammar. Increasing mastery of the basic skills of speaking, listening, reading and writing.

PREREQ: SPAN 102 or SPAN 106.

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: SPAN 111.

RESTRICTIONS: Four years of high school Spanish acceptable in lieu of Prereq. Satisfies the Arts and Science foreign language requirement.

SPAN 203 Spanish Reading and Composition 3

Major emphasis on reading development, composition and literary analysis.

PREREQ: SPAN 107 or SPAN 112.

RESTRICTIONS: SPAN 202 and SPAN 203 cannot both count toward graduation.

SPAN 204 Spanish Composition and Grammar 3

Intensive study of selected grammatical topics (subjunctive, ser-estar, preterite and imperfect). Vocabulary exercises and short compositions.

PREREQ: SPAN 107 or SPAN 112.

RESTRICTIONS: SPAN 201 and SPAN 204 cannot both count toward graduation.

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 and minimum grade of B.

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.

SPAN 207 Contemporary Latin America I 2-3

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 and Science foreign language requirement.

SPAN 208 Contemporary Spain I 2-3

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 211 Spanish Civilization and Culture 3

Survey of geography, history, art and society of Spanish-speaking lands.

PREREQ: SPAN 107 or SPAN 112.

RESTRICTIONS: Taught in Spanish.

SPAN 212 Latin American Civilization and Culture 3

Survey of geography, history, art and society of Latin American lands.

PREREQ: SPAN 107 or SPAN 112.

RESTRICTIONS: Taught in Spanish. May be taken in lieu of SPAN 211.

SPAN 250 Introduction to Business Spanish 3

Familiarizes students with characteristics of business Spanish (terminology, syntactical patterns, etc.) and policies and practices of the Spanish business community.

PREREQ: SPAN 107 or SPAN 112.

SPAN 255 Spanish Politics in the Press 3

Explores topics in contemporary Spanish politics as expressed in the news media. Emphasis on current events related to the internal and external politics of Spain. Focus 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 to the 17th century. Study of representative works, discussions and collateral readings.

PREREQ: SPAN 203 or SPAN 204.

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 203 or SPAN 204.

SPAN 303 Survey of Spanish-American Literature 3

Representative works in all genres of Latin American literature from pre-Columbian to Modernism.

PREREQ: SPAN 203 or SPAN 204.

SPAN 304 Survey of Spanish-American Literature 3

Representative works in all genres of Latin American literature in the 20th century.

PREREQ: SPAN 203 or SPAN 204.

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 204 or SPAN 203.

SPAN 306 Practical Oral/Written Expression 3

Strengthens skills in grammar and vocabulary in preparation for advanced courses. Includes oral exposes, 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, including its place in today's 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

Study and practice of Spanish pronunciation and intonation. Contrastive analysis of Spanish and American English phonological systems. Introduction to Spanish dialectology.

PREREQ: SPAN 204 or SPAN 203.

RESTRICTIONS: Recommended for prospective teachers.

SPAN 350 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: SPAN 204 or SPAN 203.

RESTRICTIONS: Counts for minor credit.

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 booklet.

PREREQ: SPAN 203 or SPAN 204.

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 and the influence of the pre-Roman strata, Latin, Germanic languages and Arabic. 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.

RESTRICTIONS: Taught abroad only.

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

The reading of Don Quijote in Spanish; major themes of the book. The life and times of Cervantes. Antecedents to Don Quijote in Spanish literature. The purpose of Don Quijote. Introduction to the language of Cervantes.

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—Echegaray, Benavente and Martinez, Mistral, Jimenez, Asturias, Alexandre, 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, Aleman, Juan de la Cueva, Cervantes, Luis de Leon, Gracian 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.

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 costumbrismo to the present.

PREREQ: One 300-level survey of literature.

SPAN 435 Spanish Medieval Literature 3

Study of the literature from the early lyric poetry to the 15th century.

PREREQ: One SPAN 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 Gaité, Ana Maria Moix and Esther Tusquets. Analysis of these works grounded in international literary theory and criticism.

PREREQ: One SPAN 300-level survey of literature.

SPAN 441 The Contemporary Spanish and Spanish-American Novel 3

Study of the novel of the 20th century considered as an artistic expression of the thought and life of the Hispanic world.

PREREQ: One SPAN 300-level survey of literature.

SPAN 443 Mexican Literature 3

Representative authors from the Colonial period to the present.

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 451 Contemporary Spanish Poetry 3

Analysis of Spanish poetry from Becquer to the present day.

PREREQ: One SPAN 300-level survey of literature.

SPAN 455 Selected Authors, Works and Themes 3

Works of one or more outstanding authors or on a special theme.

PREREQ: Two 300-level Spanish literature courses.

RESTRICTIONS: May be repeated for credit when topics vary.

SPAN 462 Spanish Essay and Criticism of the Twentieth Century 3

Study of contemporary critical works and essays.

PREREQ: One SPAN 300-level survey of literature.

SPAN 466 Independent Study 1-3**SPAN 482 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 and Calderon de la Barca, and finds their legacy in the plays of Saavedra, Zorrilla, Garcia Lorca and Casona. 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 484 Contemporary Spanish Theatre 3

Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre.

PREREQ: One SPAN 300-level survey of literature.

SPAN 533 Spanish Readings for Ph.D. Candidates 3 PF

A basic course with emphasis on developing reading comprehension.

RESTRICTIONS: For graduate students in other disciplines with little or no Spanish language background.

SPAN 601 Advanced Spanish Grammar 3

Systematic study of standard written and oral Spanish syntax. Translation and syntactic exercises.

SPAN 603 History of the Spanish Language 3

History of the language and the influence of the pre-Roman strata, Latin, Germanic language and Arabic. Historical phonology and morphology.

SPAN 615 Latin American Literature and Its Political Context 3

In-depth analysis of selected works by contemporary Latin American authors, focusing on techniques used by these writers to reveal the political upheaval that has affected Latin America in recent years.

SPAN 616 Cervantes: Don Quijote 3

The reading of Don Quijote in Spanish; major themes of the book. The life and times of Cervantes. Antecedents to Don Quijote in Spanish literature. The purpose of Don Quijote. Introduction to the language of Cervantes.

SPAN 617 Hispanic Nobel Prize Authors 3

Studies the works of Spanish and Latin American Nobel Prize authors – Echegaray, Benavente and Martinez, Mistral, Jimenez, Asturias, Aleixandre, Neruda and Garcia Marquez – in relation to their cultural milieu on the regional, national and international levels and in relation to their authors' biographies.

SPAN 618 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 fifteenth to the seventeenth centuries. Authors studied include Santillana, Diego de San Pedro, Aleman, Juan de la Cueva, Cervantes, Luis de Leon, Gracian and Quevedo.

SPAN 630 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.

SPAN 633 Modern Spanish Literature 3

Spanish drama and lyric poetry from Romanticism to contemporary period.

SPAN 634 Modern Spanish Literature 3

Prose from costumbrismo to the present.

SPAN 635 Spanish Medieval Literature 3

Study of the literature from the early lyric poetry to the 15th century.

SPAN 636 Studies in the Literature of the Spanish Golden Age 3

The poetry and prose of the 16th and 17th centuries.

SPAN 639 Postwar Spanish Narrative 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 Gaité, Ana Maria Moix and Esther Tusquets. Analysis of these works is grounded in international literary theory and criticism.

SPAN 641 The Contemporary Spanish and Spanish-American Novel 3

Study of the novel of the 20th century considered as an artistic expression of the thought and life of the Hispanic world.

SPAN 643 Mexican Literature 3

Representative authors from the Colonial period to the present.

SPAN 647 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 to situate them in their cultural, historical and aesthetic contexts, using appropriate critical methodologies.

SPAN 651 Contemporary Spanish Poetry 3

Analysis of Spanish poetry from Becquer to the present day. Special emphasis on stylistics

SPAN 655 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 662 Spanish Essay and Criticism of the Twentieth Century 3

Study of contemporary critical works and essays.

SPAN 682 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 Casona. Investigates the sources and interpretation of the contemporary theatre, and how they have been influenced by the earlier dramatists.

SPAN 684 Contemporary Spanish Theatre 3

Twentieth-century Spanish theater as a reflection of and commentary on society. Principal authors: Garcia Lorca, Buero Vallejo and Sastre.

SPAN 869 Master's Thesis 1-6

Statistics

STAT 201 Introduction to Statistics I 3

Probability, estimation, classical statistical inference and modern decision theory.

STAT 202 Introduction to Statistics II 3

Correlation and regression, multiple regression, analysis of variance, classical time series, short- and long-term forecasting, smoothing, and index numbers: business indicators.

PREREQ: STAT 201.

STAT 205 Statistical Methods 4

Descriptive statistics, graphical displays, sampling, variation, normal distribution, estimation, hypothesis testing, one way analysis of variance, simple linear regression and goodness of fit. Laboratory covers use of statistical packages on mainframe and microcomputers.

PREREQ: MATH 210 or MATH 230.

STAT 366 Independent Study 1-6

STAT 370 Introduction to Statistical Analysis I 3

Probability, continuous and discrete distributions, descriptive statistics, distributions of functions of random variables, maximum likelihood estimation and properties of estimators.

PREREQ: MATH 222 or MATH 243.

STAT 371 Introduction to Statistical Analysis II 3

Estimation, confidence intervals, tests of hypothesis, linear and multiple regression, correlation, nonparametric methods and Chi-square tests of models.

PREREQ: STAT 370.

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: STAT 371.

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: STAT 371.

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.

PREREQ: MATH 243.

STAT 466 Independent Study 1-6

STAT 473 Statistics Projects 3

Experimental, theoretical and literature studies of statistics problems.

PREREQ: STAT 371.

STAT 474 Statistics Projects 3

Experimental, theoretical and literature studies of statistics problems.

PREREQ: STAT 473.

STAT 555 Statistics for Business and Economics 3

Statistical inference, modern decision making, measures of association, classical time series analyses, forecasting and non-parametric techniques.

PREREQ: MATH 222

STAT 600 Fundamentals of Statistical Analysis 3

Basic topics in mathematics of most importance in probability and statistics. Selected topics in analysis. Arithmetic operations on arrays and matrices. Least squares approximation and the projection theorem.

STAT 601 Probability Theory and Applications 3

See MATH 630 for course description.

STAT 602 Mathematical Statistics 3

Derived sampling distributions, decision theory, estimation theory, multivariate normal, hypotheses testing and special topics.

PREREQ: MATH 630.

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: STAT 202, STAT 371 or STAT 555.

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: STAT 371.

STAT 616 Design and Analysis of Experiments 3

Planning of experiments, designs for specific problems, fractional factorials, quasifactorial experiments, balanced and unbalanced designs, confounding, introduction to linear estimation.

PREREQ: STAT 615.

STAT 617 Multivariate Methods 3

Multivariate analysis of variance and covariance, classification and discrimination, canonical correlation, principal components and factor analysis.

PREREQ: STAT 371.

STAT 618 Sampling Techniques 3

Simple random sampling, stratified random sampling, ratio estimates, regression estimates, systematic sampling, cluster sampling and double sampling.

PREREQ: STAT 371.

STAT 620 Nonparametric Statistics 3

Statistical procedures valid under unrestrictive assumptions; scales of measurement; efficiency comparisons; signed rank procedures; two-sample rank tests; zeros, ties, and other problems of discrete data; order statistics; k-sample procedures; and nonparametric measures of correlation.

PREREQ: STAT 601 and STAT 371.

STAT 635 Statistical Quality Control 3

Process variation, sequence plotting, control charts, cumulative sum process control procedures, process capability studies, acceptance sampling, quality management and organization, and trouble-shooting using graphical techniques.

PREREQ: STAT 371 or STAT 450.

STAT 640 Statistical Consulting 3

The client-consultant relationship. Effective communication. Identifying the question, developing a plan and presenting the results. Following up. Actual consulting experience.

STAT 641 Statistical Laboratory 1

Involves attendance at weekly statistical laboratory meetings.

STAT 650 Statistics for the Engineering and Physical Sciences 3

Combinatorial probability, distribution theory, estimation and hypothesis testing. Experimental design; analysis of variance and regression theory.

PREREQ: MATH 243.

STAT 656 Statistics for the Biological Sciences 3

Poisson processes; tolerance distributions; assays; nonparametric techniques; estimation; test of hypotheses; orthogonal, nonorthogonal, and arbitrary designs; missing values; and iterative techniques in regression.

PREREQ: STAT 201.

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 GEOL 657.

PREREQ: STAT 201.

STAT 800 Estimation and Statistical Inference 3

In-depth coverage of selected topics in estimation and inference such as uniformly most powerful tests, uniformly most powerful unbiased tests, similarity and completeness, sufficiency, likelihood ratio tests, invariant tests, permutation test, maximum likelihood estimation, robust estimation and Pitman efficiency.

PREREQ: STAT 602 and MATH 602.

STAT 801 Estimation and Statistical Inference 3

Covers further topics in estimation and inference.

PREREQ: STAT 800.

STAT 815 Linear Statistical Inference I 3

Vector random variables, matrix operations, multivariate normal distributions, distribution of functions of vector random variables, topics from multivariate analysis and specific linear models.

PREREQ: STAT 602 and STAT 616.

STAT 816 Linear Statistical Inference II 3

Topics from general linear hypotheses of full rank and not full rank.

PREREQ: STAT 815.

STAT 818 Multivariate Analysis 3

Likelihood estimation, vector random variables, Hotelling's T-squared distribution of correlation coefficients, classification and discrimination, distribution of sample covariance matrix and generalized variance, and testing multiple hypotheses.

PREREQ: STAT 800.

STAT 824 Advanced Topics in Statistics I 3

Presentation of a current area of statistical application or research. Examples of topics covered include: biometry, bootstrapping, data analysis, response surfaces, survival analysis and time series.

PREREQ: STAT 816.

STAT 825 Advanced Topics in Statistics II 3

Presentation of a current area of statistical application or research. Examples of topics covered includes: biometry, bootstrapping, data analysis, response surfaces, survival analysis and time series.

PREREQ: STAT 816.

STAT 831 Time Series Analysis 3

Introduction to fundamental topics in time series analysis featuring analysis in both time and frequency domains. The Box and Jenkins technique of fitting data to autoregressive moving average models used in the time domain. Emphasis on model building, evaluation and forecasting. Analysis in the frequency domain includes such topics as digital filtering and methods of estimating and interpreting the spectrum.

PREREQ: STAT 602.

STAT 832 Topics in Data Analysis 3

Topics: graphical analysis, model evaluation and robust procedures, influence functions, multidimensional data plots, residual analysis, and Bayesian concepts in data analysis.

STAT 836 Response Surface Methodology 3

Derivation of nonlinear relationships between variables. Techniques for characterization and interpreting multidimensional systems through canonical and ridge analysis. Correlation analysis through eigenvalues and eigenvectors for linear systems.

PREREQ: STAT 602 and either STAT 611 or STAT 617.

STAT 840 Statistical Computing 3

Computer organization. Error in floating point computation. Approximating probabilities. Random numbers: generating and testing. Simulation. Computational linear algebra. Optimization methods appropriate for maximum likelihood computation. Fast Fourier transforms.

STAT 852 Advanced Topics in Mathematical Statistics 3

Selected topics: Sequential methods, reliability theory, multivariate contingency tables, large sample theory, density estimation, robust and nonparametric estimation.

RESTRICTIONS: Requires permission of Department.

STAT 856 Topics in Biometry 3

Selected topics from Poisson processes; tolerance distribution; assays; nonparametric techniques; estimation; tests of hypothesis; orthogonal, nonorthogonal and arbitrary designs. Missing values and iterative regression methods. Special experimental designs. Multivariate methods, response surfaces and epidemic theory.

RESTRICTIONS: Requires permission of Department.

STAT 868 Research 1-6

STAT 869 Master's Thesis 1-9

STAT 969 Doctoral Dissertation 1-12 PF

Textiles, Design and Consumer Economics

TDCE 110 Introduction to Interior Design 3

Basic principles and elements of professional interior design related to residential interiors are defined, experimented with and explored.

TDCE 114 Clothing in Contemporary Society 3

Introduction to the study of clothing including social psychological influences in personal clothing choice, basic concepts of fashion: structure and operation of the apparel industry, elements of apparel quality and retailing of clothing.

TDCE 115 Introduction to Textiles 3

Introduction to fiber theory, fiber identification methods, yarn structure, textile fabrications (weaves, knits), dyes and printing, and finishing techniques.

TDCE 200 Consumer Economics 3

Consumer decision making, theory of consumer markets, analysis of consumption activities of individuals and families, interaction of consumers, government and the marketplace.

PREREQ: ECON 151 or ECON 152

TDCE 211 Basic Clothing Processes 3

Basic clothing construction procedures, fitting techniques and methods of evaluation for apparel.

RESTRICTIONS: For students with limited or no construction experience. Credit cannot count for both TDCE 211 and TDCE 216 except for apparel design majors.

TDCE 214 Costume History Before 1700 3

Costume as a mirror of civilization in Western Europe and the Near East from antiquity through the 17th century. Influence of societal, economic and aesthetic factors upon the development of costume.

TDCE 216 Advanced Clothing Processes 3

Advanced clothing construction and fitting principles and processes; comparative analysis of assembly and organizational procedures including industrial concepts.

RESTRICTIONS: Advanced placement required. Credit not given for both TDCE 211 and TDCE 216 except for apparel design majors.

TDCE 218 Fashion Merchandising 3

An overview of the fashion industry which examines the interrelationship between primary, auxiliary and retail fashion markets; trends in fashion retailing, promotion and manufacturing.

TDCE 221 Interior Color Systems 3

Standard color systems and theories as applied to interior environments: experimentation with the interaction of color, texture and various light sources.

PREREQ: TDCE 110 and TDCE 225.

TDCE 224 Clothing Design and Production Since 1700 3

Clothing design and production in America and Western Europe since 1700. Study of craft skills, growth of ready-to-wear industry, couture and 20th-century manufacturing and fashion centers.

TDCE 225 Architectural Drawing 3

Introduction to the handling of the tools, techniques and terms of architectural drawing and the designing of plans, elevations, sections and drawing of isometrics and perspectives.

TDCE 233 Fashion Drawing and Rendering 3

Drawing from the fashion model; emphasis on rendering clothing character, fabrics and fashion details using various media; translation of drawings to finished fashion illustrations.

PREREQ: ART 129.

TDCE 234 Residential Design 3

Study of space use, forms, functions, cost and aesthetics as they relate to residential interior environments.

PREREQ: TDCE 110 and TDCE 325.

TDCE 235 Management of Resources 3

Management of individual resources for the purpose of reaching goals. The influence of values, resources and decision making upon individual and societal management practices.

TDCE 242 Consumer Movement in Perspective 3

The history, present status and possible future of the consumer movement in the United States examined within the context of the existing economic, political and social environments.

TDCE 310 Housing 3

Selection of housing as related to varying income levels and stages in the life cycle; types of housing, government agencies, and design considerations for special groups.

TDCE 311 Building Systems I 3

Examination of various major building systems and materials as they relate to the interior environment. Emphasis on selection, cost evaluation and utility.

PREREQ: TDCE 234.

TDCE 312 American Residential Style 3

Historic survey of residential architectural styles from 1700 to present. Emphasis on exterior design elements as they relate to interior layouts, details, ornamentation and furnishings. Field trips.

TDCE 314 Apparel Design I 3

Comparative study of the foundation principles and processes of apparel design utilizing draping, flat pattern and simple drafting techniques.

PREREQ: TDCE 216.

TDCE 315 Textile Analysis 3

Structure of the textile industry; physical and chemical properties of fibers and finishes as they relate to end use and care. Fiber and fabric production.

PREREQ: TDCE 115 and CHEM 213.

TDCE 317 Tailoring 3

Principles and processes involved in accepted methods of tailoring suits and coats.

PREREQ: TDCE 211 or TDCE 216.

TDCE 318 Fashion Merchandise Products 3

Examines various types of fashion merchandise including the range of characteristics, sources and manufacturing processes. Emphasis on leather, furs, jewelry, kitchen and home furnishings, and allied merchandise areas.

TDCE 320 Fashion Merchandising Internship 6

An off-campus supervised and coordinated field study program in selected retail stores.

TDCE 321 Travel Study Program 1-6

Study of the domestic and/or international textiles, apparel, interior and allied fashion industries through visits and research projects.

RESTRICTIONS: Requires TDCE faculty approval through an application process. Offered at regular intervals.

TDCE 324 Apparel Design II 3

Comparative study of advanced concepts and processes of apparel design utilizing draping, flat pattern and simple drafting techniques.

PREREQ: TDCE 314 and TDCE 333.

TDCE 325 Presentation Techniques 3

Development of skills in perspective drawing as well as other presentation techniques for interior design depiction. Mixed media.

PREREQ: TDCE 225.

TDCE 328 Fashion Sales Promotion 3

Fashion advertising, fashion promotion and other special purpose media utilized uniquely in the world of fashion. Emphasis not only on various components of fashion promotion media and their interrelationship, but also on interdependency of promotional strategy and fashion merchandising.

TDCE 330 Apparel Design Internship 4

An off-campus, supervised field study program in selected business concerns dealing with apparel design and/or manufacture.

RESTRICTIONS: Requires permission of instructor.

TDCE 333 Fashion Design 3

Focuses on the creative apparel design process by examining and experimenting with structural and decorative design elements. Utilizes historic, ethnic and trend research as inspiration. Utilizes computer graphics to explore multiple solutions to theoretical and practical design problems.

PREREQ: TDCE 233.

TDCE 334 Contract Design I 3

Studio design of contract interior with emphasis on space planning, function, aesthetics, costs and codes as they relate to commercial and institutional environments. Field trips.

PREREQ: TDCE 234, TDCE 325 and TDCE 341.

TDCE 335 Consumer Financial Management 3

Analysis of financial models utilized in planning, organizing and initiating a strategy for generating and allocating earned and unearned income. Emphasis on studying consumer financial decision making during various stages of an individual's life cycle (e.g., single, newly-married, single parent, etc.).

TDCE 340 Consumer Affairs Internship 4

An off-campus supervised and coordinated field study in selected agencies and organizations.

PREREQ: TDCE 200.

RESTRICTIONS: May be repeated once for credit.

TDCE 341 Interior Lighting Systems 3

Basic lighting principles, systems, equipment and fixtures as applied to residential and commercial interior environments. Field trips.

PREREQ: TDCE 234.

TDCE 342 Consumer Laws and Regulations 3

In-depth examination of consumer legislation and regulation policies at the federal and state level. Major pieces of consumer legislation, as well as the agencies responsible for implementing and enforcing these policies, examined in terms of efficiency and effectiveness.

PREREQ: TDCE 200, ECON 151 or ECON 152.

TDCE 351 Detail Drawing 3

Introduction to drawing techniques used to represent cabinet construction and related interior details. Methods of construction and assembly of wood and metal interior products. Field trips.

PREREQ: TDCE 234 and TDCE 325.

TDCE 366 Independent Study 1-6

TDCE 400 Controversial Issues in Consumer and Family Behavior 3

Utilizes an economic approach to consumer and family behavior to examine how various economic, social, legal and corporate policies encourage or discourage family investment in human capital. Issues and their relationship to the development and utilization of human capital within the family unit vary.

PREREQ: ECON 151.

RESTRICTIONS: Open to Juniors and Seniors only.

TDCE 401 Consumer Policy Analysis 3

Analysis of a consumer welfare related market practice issue. Issue may change. Use of management problem-solving tools to understand the issue and develop policies.

PREREQ: TDCE 342.

TDCE 410 Environmental Products 3

Analysis of and experimentation with fundamental components of contemporary interior design including wall finishes, window treatments, floor coverings, and furnishings for residential and contract environments.

PREREQ: TDCE 234 and TDCE 334.

TDCE 415 Topics in Textiles 3

One topic, either fiber science, textile analysis, or textile dyeing and finishing, covered each semester.

PREREQ: TDCE 315.

TDCE 416 Fashion Direct Marketing 3

Examines the scope and application of direct marketing including mail-order, customer lists, catalogues, telemarketing, inserts, magazines and package goods applied to the clothing and textile industries.

TDCE 418 Advanced Fashion Merchandising 3

Focuses on the mathematical concepts and calculations used in merchandising soft goods at the retail level. Emphasis on mark-ons, markdowns, retail method inventory, open-to-buy and vendor negotiations.

PREREQ: TDCE 218 and ACCT 207.

TDCE 419 Social Psychological Aspects of Clothing 3

Study of clothing and appearance as contributors to human interactions; consideration of the importance of clothing in individual and collective behavior. Analysis of how dress reflects self-feelings, establishes social identities and affects interpersonal encounters.

PREREQ: TDCE 114, PSYC 201 and SOCI 201.

TDCE 422 Family Financial Management 3

Problem-solving approach for resolving family financial problems using a variety of financial management techniques. Primary focus oriented toward financial counseling, financial planning or a combination of the two.

PREREQ: TDCE 335.

TDCE 424 Apparel Design III 3

Interdisciplinary approach to functional fashion apparel design. Topics include market analysis, human movement and comfort, material structures, and manufacturing processes.

PREREQ: TDCE 314, TDCE 333, BISC 016 and BISC 116.

TDCE 425 Textile Performance 3

Physical analysis of textiles through experimental and standard testing procedures, current literature and individual investigation.

PREREQ: TDCE 115.

TDCE 426 Fundamentals of Textile Conservation 3

Introduces scientific principles relevant to the cleaning, repair, storage and exhibition of antique textiles. Evaluates treatment procedures that eliminate damaging agents, retard their effects, or shield textiles from them.

TDCE 431 Contract Design II 3

Studio work in the exploration, programming, design development, specification, and presentation of major interior design problems. Field trips.

PREREQ: TDCE 234, TDCE 334, TDCE 325 and TDCE 341.

TDCE 433 Mass Market Apparel 4

Utilizes CAD to develop ready-to-wear apparel. Emphasizes relationships among design, production, costing and quality. Sizing standards; computer-aided pattern designing, grading, and marker making; and garment assembly. Field trip.

PREREQ: TDCE 314.

TDCE 435 Consumer and the Environment 3

Analysis of dwindling energy resources and their effect upon consumer alternatives in the marketplace; sociocultural, family and income aspects of consumer behavior in a high energy consuming society.

PREREQ: TDCE 200, ECON 151 or ECON 152.

TDCE 440 Advanced Consumer Economics 3

Application of economic tools to analyze consumer welfare in public and private markets. Efficiency and equity trade-offs, externalities, cost-benefit, program evaluation.

PREREQ: TDCE 200 and TDCE 342.

TDCE 450 The Historic Interior 3

Survey of the design and function of interior spaces and furnishings in the context of the cultures and the times from which they evolved. Primary emphasis on Western Europe and America. Primitive cultures, early civilizations and the Orient also explored. Field trips.

TDCE 451 Contemporary Furnishings 3

A survey of modern design evolution in furniture, textiles and the minor arts from the late 19th century to the present. Emphasis on styling and technological forces shaping 20th-century design of interior furnishings. Field trips.

TDCE 455 Textiles, Clothing and the Economy 3

The interplay of economic forces in the production, marketing and consumption of textiles and clothing.

PREREQ: ECON 151 or ECON 152.

TDCE 461 Building Systems II 3

Mechanical systems including HVAC, plumbing, conveying and fire protection systems as they relate to architectural and interior space planning. Emphasis on system selection, sizing and energy efficient uses.

TDCE 463 Interior Design Seminar 3

Exploration of career directions in the profession of interior design. Study of business practices and ethics, development of professional portfolios and preparation for the post-graduate professional examination. Field trips.

RESTRICTIONS: Open only to interior design majors with Senior standing.

TDCE 465 Seminar 1-3 PF

May be repeated to a maximum of three credits.

TDCE 466 Independent Study 1-6

TDCE 665 Seminar 1-3

TDCE 668 Research 1-6

TDCE 868 Research 1-6

TDCE 869 Master's Thesis 1-6

Theatre

THEA 102 Introduction to Performance 3

A survey of performance training techniques for the non-minor, 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 DelSarte, Laban, Decroux and others. Students engage in learning and performing short mime pieces for class.

THEA 206 Introduction to Dance 3

Survey of theatrical dance forms to include Ballet (Classical and Neo-Classical styles); Modern Dance (the pioneers through the mainstream to today's post-postmodern); and Jazz (its roots in African Dance and its development as the American art form through the minstrel era, burlesque, vaudeville, ragtime, early musical comedy and musical theatre). Lecture and studio format.

THEA 207 Production Practicum 1-4

Laboratory course for the production of scenery, properties, lighting, sound and/or costumes for public performances of the Professional Theatre Training Program Productions.

THEA 208 History of the American Musical Theater 3

See MUSC 208 for course description.

THEA 220 Movement and Nonverbal Communication I 3

Emphasis on actor's physical expression of ideas, attitudes and feelings. Basic stage techniques, exploration of power and presence, and development of imagination and ability to use metaphor. Relationship of nonverbal communication to text in building a character.

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 246 Fundamentals of Costume Construction 3

Teaches basic principles of draping, pattern making and crafts for costuming. Practical experience in costuming through lectures and labs.

THEA 337 Jazz Dance 3

Jazz dance as an art form and vehicle for individual and group expression. Introduces criteria for judgment and response. Develops performance potential.

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 CMLT 341.

THEA 342 Theatre/Drama: Renaissance to 1700 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 CMLT 342.

THEA 343 Theatre/Drama: 1700 to 1900 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 CMLT 343.

THEA 344 Theatre/Drama: 1900 to Present 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 CMLT 344.

THEA 345 History of Theatre: American Musical Theatre 3

Musical-dramatic forms of the 18th, 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 MUSC 345.

THEA 346 History of Theatre: The American Theatre 3

Survey of major historical and theoretical developments in American theatre practice and dramaturgy from Revolutionary times to the present. Readings in primary and secondary historical sources, major critical and theoretical texts, as well as representative plays of the period.

THEA 360 Fundamentals of Oral Interpretation 3

Basic course in interpretation of text for the stage. Concentrates on texts from plays; explores prose and poetry. Emphasis on diction, meaning and presentation. Studio format.

THEA 366 Independent Study 1-6**THEA 410 Fundamentals of Dramaturgy 3**

Topics covered include various methods of dramatic and entertainment analysis, scene analysis, development of dramaturgical plot, fable and practice. Survey of function and role of the dramaturg in contemporary theatre. Readings in primary and secondary material.

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 476 Seminar in Performance 3**

Advanced seminar in performance theories and techniques. Topics will be announced.

PREREQ: THEA 226.

THEA 490 Seminar in Theatre and Drama 3

Advanced 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 621 Stage Directing IA 1

Fundamental techniques of planning and staging of production.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing.

THEA 622 Stage Directing IB 1

Continuation of THEA 621.

PREREQ: THEA 621.

THEA 623 Stage Directing IIA 1

Continuation of THEA 622, with an emphasis on techniques of script preparation and actor coaching.

PREREQ: THEA 622.

THEA 624 Stage Directing IIB 1

Continuation of THEA 623.

PREREQ: THEA 623.

THEA 625 Stage Directing IIIA 1

Continuation of THEA 624, with an emphasis on text analysis and actor coaching and an examination of styles and genres.

PREREQ: THEA 624.

THEA 626 Stage Directing IIIB 1

Continuation of THEA 625.

PREREQ: THEA 625.

THEA 627 Stage Management for Directors 1

Techniques and methods of stage management from the directorial point of view.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing. May be repeated for up to two credit hours.

THEA 628 Set Design for Directors 1

Principles of scenic design from a directorial point of view.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing.

THEA 629 Costume Design for Directors 1

Principles of costume design from a directorial point of view.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing.

THEA 630 Production Budgeting 1

Principles of assessing production expenses, time and personnel requirements for the professional theatre.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing.

THEA 631 Rehearsal and Performance/Directing 1-3

Practical training in stage direction through serving as assistant director on faculty-directed productions.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Directing. May be repeated for up to ten credit hours.

THEA 633 Stage Management Organizational and Managerial Techniques IA 1

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 IB 1

Further development of organizational structuring and communication techniques for the administration of stage managerial projects.

PREREQ: THEA 633.

THEA 635 Stage Management Organizational and Managerial Techniques IIA 1

Development of organizational structuring and communication techniques for the administration of stage managerial projects.

PREREQ: THEA 634.

THEA 636 Stage Management Organizational and Managerial Techniques IIB 1

Further development of organizational structuring and communication techniques for the administration of stage managerial projects.

PREREQ: THEA 635.

THEA 637 Stage Management Organizational and Managerial Techniques IIIA 1

Development of organizational structuring and communication techniques for the administration of stage managerial projects.

PREREQ: THEA 636.

THEA 638 Stage Management Organizational and Managerial Techniques IIIB 1

Further development of organizational structuring and communication techniques for the administration of stage managerial projects.

PREREQ: THEA 637.

THEA 639 Stage Management Production Skills IA 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 2

Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.

PREREQ: THEA 639.

THEA 641 Stage Management Production Skills IIA 2

Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.

PREREQ: THEA 640.

THEA 642 Stage Management Production Skills IIB 2

Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.

PREREQ: THEA 641.

THEA 643 Stage Management Production Skills IIIA 2

Development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.

PREREQ: THEA 642.

THEA 644 Stage Management Production Skills IIIB 2

Further development of stage managerial skills for organizing, preparing and fulfilling theatrical productions from inception through rehearsals and performance.

PREREQ: THEA 643.

THEA 645 Rehearsal and Performance/Stage Management 1-3

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 credits.

THEA 647 Stage Makeup 1

Study and practical work in all aspects of stage makeup. Emphasis on the use of materials, the effects of light and color and character analysis.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 648 Costume Construction 1

Introductory course exploring the mechanics and technology of the art of costuming. Surveys all aspects of the costumer's craft including practical work in the costume shop.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Construction.

THEA 649 Costume Design 1

An approach to the designing of costumes for plays through an appreciation and understanding of the basic principles of design. Covers in depth theatrical rendering technique, color theory and the elements of design.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 650 Historical Costume I 1

Examines theatrical costume as well as concurrent fashion trends from primitive ritual to Restoration theatrical works in the 17th century.

THEA 651 Historical Costume II 1

A study of costume and theatrical costume history from 1670 to the present. Emphasis on sociological changes in patterns of fashion behavior and recreating that attitude for stage.

THEA 652 Tailoring I 1

Construction of stage costumes: intermediate and advanced dressmaking and tailoring techniques, textiles survey, cutting, fitting and alterations.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 653 Tailoring II 1

Construction of stage costumes: advanced tailoring techniques and practical application of skills in costume shop.

PREREQ: THEA 652.

THEA 654 Patternmaking I 1

Basic patternmaking, includes drafting of basic slopers, sleeves, collars, pants, etc. Emphasis on theatrical costumes.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 655 Patternmaking II 1

Advanced pattern drafting of period patterns, coats, suits and menswear for the theatre.

PREREQ: THEA 654.

THEA 656 Patternmaking III 1

Continuation of THEA 655. Emphasis on Renaissance and Restoration costumes.

PREREQ: THEA 655.

THEA 657 Patternmaking IV 1

Continuation of THEA 656. Emphasis on 19th-century men's and women's costumes.

PREREQ: THEA 656.

THEA 658 Costume Crafts I 1

Study and practical work in dyeing and painting for costumes.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 659 Costume Crafts II 1

Advanced projects in costume accessory construction. Emphasis on millinery, hat blocking, wigmaking and new techniques in related areas.

PREREQ: THEA 658.

THEA 660 Costume Crafts III 1

Study and practical work in three dimensional construction techniques to include maskmaking, armor, molding and leatherwork and sculptural foam animals.

PREREQ: THEA 659.

THEA 661 Draping I 1

Advanced study in construction of stage costumes with an emphasis on draping.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 662 Draping II 1

Emphasis on advanced draping problems with detailed period and contemporary costumes.

PREREQ: THEA 661.

THEA 663 Draping III 1

Continuation of THEA 662 with emphasis on Renaissance and Restoration costume.

PREREQ: THEA 662.

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 Seminar in Historical Literacy and Critical Foundations of Theatrical Performance 2

Discussion and research in a specific area of the history, literature and criticism of theatrical performance.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program. May be repeated for up to 12 credit hours.

THEA 668 Research 1-6**THEA 669 Draping IV 1**

Continuation of THEA 663 with emphasis on 18th- and 19th-century costume.

PREREQ: THEA 663.

THEA 670 Costume Shop Management 1

Problems and techniques of costume shop management, personnel organization, equipment, inventory and supply control, and financial organization and management.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Costume Production.

THEA 671 Applied Costume Shop Management 1

Practical application of skills learned in THEA 670.

PREREQ: THEA 670.

THEA 672 Production Preparation and Performance 1-4

Practical instruction and assignments in the preparation, construction and mounting of costumes and costume accessories for theatrical performances.

RESTRICTIONS: May be repeated for up to 22 credits.

THEA 674 Scenery and Properties Production IA 1

Development of the skills necessary for the construction of scenery and properties including woodworking, metal working and plastics fabrication. Emphasis on basic stagecraft theory and skills.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 675 Scenery and Properties Production IB 1

Continuation of THEA 674, with emphasis on properties production and organization.

PREREQ: THEA 674.

THEA 676 Scenery and Properties Production IIA 1

Continuation of THEA 675, with emphasis on weight-bearing construction, basic metal working and stage rigging techniques.

PREREQ: THEA 675.

THEA 677 Scenery and Properties Production IIB 1

Continuation of THEA 676, with emphasis on furniture construction and finished carpentry, plastics fabrication, sewing skills and basic upholstery.

PREREQ: THEA 676.

THEA 678 Scenery and Properties Production IIIA 1

Continuation of THEA 677, with emphasis on scenic shifting and rigging techniques, upholstery, and casting and molding techniques.

PREREQ: THEA 677.

THEA 679 Scenery and Properties Production IIIB 1

Continuation of THEA 678, with emphasis on pneumatics, hydraulics and motorized rigging in addition to pyrotechnique and special effects.

PREREQ: THEA 678.

THEA 680 Electrics and Audio Production IA 1

Development of skills necessary for producing lighting and sound for theatre productions. Emphasis on basic stage lighting practice and electrical theory.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 681 Electrics and Audio Production IB 1

Continuation of THEA 680, with emphasis on basic theatre sound practice and building production sound tapes.

PREREQ: THEA 680.

THEA 682 Electrics and Audio Production IIA 1

Continuation of THEA 681, with emphasis on electrical control devices and techniques, studio and field recording techniques, and mixing and editing techniques.

PREREQ: THEA 681.

THEA 683 Electrics and Audio Production IIB 1

Continuation of THEA 682, with emphasis on electrical distribution. Systems and sound reinforcement techniques.

PREREQ: THEA 682.

THEA 684 Electrics and Audio Production IIIA 1

Continuation of THEA 683, with emphasis on maintenance and repair of electrical and audio equipment.

PREREQ: THEA 683.

THEA 685 Electrics and Audio Production IIIB 1

Continuation of THEA 684, with emphasis on advanced mixing and editing techniques and advanced electrical control techniques.

PREREQ: THEA 684

THEA 686 Painting, Graphics and Design for Production IA 1

Development of skills in theatre graphic communications, scenic painting and design theory. Emphasis on basic drafting techniques for lighting and scenic productions.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program/Technical Production.

THEA 687 Painting, Graphics and Design for Production IB 1

Continuation of THEA 686, with emphasis on basic scene painting techniques.

PREREQ: THEA 686.

THEA 688 Painting, Graphics and Design for Production IIA 1

Continuation of THEA 687, with emphasis on advanced work in perspective, color theory in painting and scene design theory.

PREREQ: THEA 687.

THEA 689 Painting, Graphics and Design for Production IIB 1

Continuation of THEA 688, with emphasis on advanced drafting: true shape analysis, basic lighting design theory and process, and reproducing painter's elevations.

PREREQ: THEA 688.

THEA 690 Painting, Graphics and Design for Production IIIA 1

Continuation of THEA 689, with emphasis on advanced work in scene painting and drafting as well as sound design theory.

PREREQ: THEA 689.

THEA 691 Painting, Graphics and Design for Production IIIB 1

Continuation of THEA 690, with emphasis on advanced work in scene painting and drafting.

PREREQ: THEA 690.

THEA 692 Production Preparation and Performance/Technical 1-4

Practical instruction and assignments in the technical preparation and production of Professional Theatre Training Program public performances. Assignments include Master Carpenter, Master Electrician, Property Master, Sound Technician, 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.

THEA 694 Career Preparation and Development 1

Development and organization of portfolio, resume and interview techniques in preparation for careers in stage management, costume production and technical production.

RESTRICTIONS: Requires enrollment in the Professional Theatre Training Program.

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 330 Del Central Year Abroad 0 PF

UNIV 350 National Student Exchange Program 0 PF

UNIV 351 Semester in Copenhagen 0 PF

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: BUAD 301 and BUAD 311.

RESTRICTIONS: Requires GPA of 3.0 or higher and Junior or Senior status.

UNIV 401 Senior Thesis 2-8

A course for students working for a degree with distinction. Variable credit of two to four hours.

RESTRICTIONS: Total credit for UNIV 401 and UNIV 402 not to exceed six.

UNIV 402 Senior Thesis 2-8

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.

UNIV 491 Honors Tutorial: Natural/Social Science 3

Designated faculty direct the studies of up to three students per semester. Reading of classical works in the social and natural sciences described. Group as well as independent discussions.

RESTRICTIONS: Requires 3.4 GPA, Sophomore standing or above and permission of the Honors Program.

UNIV 500 Leave of Absence 0 PF

UNIV 899 Master's Sustaining 0 PF

UNIV 999 Ph.D. Sustaining 0 PF

Urban Affairs

URAF 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.

URAF 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.

URAF 612 Urban Housing Policy and Administration 3

Problems associated with providing adequate housing in urban areas. Housing supply problems and the relationship of supply to income, process of physical renewal, neighborhood living conditions and public programs.

URAF 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.

URAF 615 Urban and Regional Planning 3

Provides an introduction to urban planning. Focuses 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.

URAF 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.

URAF 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.

URAF 624 Seminar in Criminal Justice 3

Discussion and evaluation of institutional components of criminal justice systems. Topics include police, judicial and correctional systems.

URAF 625 Energy Policy and Administration 3

See POSC 624 for course description.

URAF 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 HIST 652 and/or MSST 629.

URAF 630 Historic Preservation Studio 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 MSST 630.

URAF 634 Housing Finance and Development 3

Fundamentals of real estate and housing finance. Various methods available to finance the development of real estate. Financial instruments 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, FHLBB and FHLMC.

URAF 637 Personnel Selection and Evaluation 3

Review of the varied legal issues, federal agency guidelines, court decisions and research-psychometric principles that influence the practice of employee selection and evaluation.

URAF 639 Public Policy Issues and Administrative Law 3

Examines, through case study, basic principles of administrative law in relation to issues of policy that public administrators face. Students select problems based on areas of individual interest for solution in accordance with such principles. May be cross-listed with MAST 639 and/or POSC 639.

URAF 640 International and Development Administration 3

See POSC 640 for course description.

URAF 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.

URAF 647 Philosophy of Technology 3

See PHIL 647 for course description.

URAF 654 Vernacular Architecture 3

See HIST 654 for course description.

URAF 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.

URAF 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 in the area.

URAF 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.

URAF 664 Case Studies in Urban 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, recreation) and problems (e.g., facility location, personnel).

URAF 800 Research Design and Methodologies 3

Provides skills and examines issues in research design, data acquisition and data analysis in urban affairs.

URAF 801 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.

URAF 803 Seminar: Public Administration 3

See POSC803 for course description.

URAF 804 Program Evaluation 3

Survey of theory and methods for the evaluation of human service programs. When possible, students participate in actual evaluative research.

URAF 806 Survey Research 3

Methods and procedures for the design, administration and analysis of sample surveys.

URAF 810 Political Economy of Urban Areas 3

Centers on economic perspectives for understanding resource allocation through private and public institutions in urban areas. Topics include land use patterns, the economic base, economic development policies, urban labor markets, income distributions, discrimination and the urban public economy.

URAF 813 Data Base and Decision Support Systems 3

Focuses on the interface between the decision maker and the information system that supports those individuals. Topics include system design, methods of retrieval, graphics and related hardware and software issues.

URAF 814 Computer in Public Management 3

Provides a comprehensive overview of data processing and systems development as seen from the viewpoint of the manager. Presents concepts in hardware, software and data communications followed by sessions on the production of software, acquisition of software and hardware, data base management systems, electronic mail and decision support systems.

URAF 815 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 815.

URAF 816 Advanced Social Statistics 3

See POSC 816 for course description.

URAF 817 Financing Alternatives in the Public Sector 3

Focuses on the means by which government activities can be financed. Topics are tax vs 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 817.

URAF 818 Environmental Policy and Administration 3

See POSC 818 for course description.

URAF 819 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 trees and time series. May be cross-listed with POSC 819.

URAF 820 Population, Urbanization and Community 3

Social scientific approaches to the nature of cities and perspectives on the modern urban community. Issues in population distribution and change, including spatial and temporal patterns in metropolitan areas.

URAF 821 Technology and Society Seminar 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 821.

URAF 822 Proseminar in Planning and Governance 3

Deals with policy and research issues concerning the making, administering and outcomes of public policies affecting urban populations and with how urban planning and governance processes are influenced by the interaction of the public, private and third sectors at the local, regional, national and international scales.

URAF 824 Governing Urban Regions 3

Analysis of development and change in the governing arrangements of urban regions, with particular emphasis on constitutional and decision rules, citizenship, costs of public action and communication channels; horizontal and vertical relationships among public organizations; the effects of scale and technology on the governing process; and public sector performance.

URAF 825 Comparative Public Administration 3

See POSC 825 for course description.

URAF 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 or capital projects were undertaken 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.

URAF 828 Urban Policy Alternatives and Analysis 3

Processes of decisions in private and public sectors. The role of private and public solutions to selected problems. Measures of limits and effectiveness of various policy approaches.

URAF 831 Seminar: Health Services Research 3

Selected topics in health services research. Topics include health planning, health care organization, health care financing, health statistics, health program evaluation, health and social policy, and health research and development policy.

RESTRICTIONS: May be repeated for up to six credit hours when topics vary.

URAF 832 Public Financial Management 3

Surveys the basic concepts, practices, procedures and techniques employed in the financial management of government operations. Topics include government accounting principles and structure, types of budgets, budgetary analysis and processes, and auditing practices. May be cross-listed with POSC 832.

URAF 833 Financial Management and Public Finance 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.

URAF 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, ecology, public health, community development, law enforcement, recreation and regulation.

URAF 835 Organization Theory and Administration 3

See POSC 835 for course description.

URAF 836 Economic Ideologies and Policies 3

Conservative, liberal and radical ideological views of the American economy. Economic problems and issues examined include government regulation, consumer protection, energy policies, environmental protection, corporate power, labor unions, transportation, education, taxation, growth and development, economic stabilization, unemployment and inflation.

URAF 837 Public Personnel Administration 3

Personnel 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 personnel specialist in designing and implementing employee and management developmental programs. May be cross-listed with POSC 837.

URAF 838 Public Policy Analysis 3

See POSC 838 for course description.

URAF 845 Introduction to Urban Affairs 1-3

Consideration of issues related to the development of urban affairs as an area of inquiry.

URAF 850 Urban Affairs Practicum 1-6

Applied projects that generally draw upon organization or public agency resources, including the College's Urban Agent Division. Projects carried out with faculty supervision and may involve one or more students or student-faculty teams.

URAF 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.

URAF 864 Internship Fieldwork 2

Three-month (or equivalent) fieldwork completed along with seminars, performance evaluation and career reflection paper.

URAF 868 Research 1-6**URAF 869 Master's Thesis 1-6****URAF 870 Readings 1-6****URAF 969 Doctoral Dissertation 1-12 PF**

Vocational Studies

VOCS 658 Field Research in Vocational Studies 1-3

Supervised research in vocational studies. Required for students electing non-thesis option.

RESTRICTIONS: Requires permission of instructor and advisor.

VOCS 664 Field Experience in Vocational Studies 1-6

Supervised activities in an educational, community or work setting.

RESTRICTIONS: Requires permission of instructor and advisor.

VOCS 665 Seminar in Vocational Studies 1-3

Analyzes specially selected topics of contemporary importance.

VOCS 666 Special Problem 1-6**VOCS 868 Research 1-6**

Research in applied technology education.

RESTRICTIONS: Requires permission of instructor and advisor.

VOCS 869 Master's Thesis 1-6

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 the perspective of different social science disciplines.

WOMS 204 Gender and Knowledge 3

Women have been largely absent from historical record and from the traditional liberal arts curriculum. Introduces, via guest lecturers, the new scholarship on women in disciplines from English literature to biology to the social sciences.

WOMS 205 Women in the Arts and Humanities 3

Interdisciplinary survey of women's contributions to the arts and humanities, also including literary/artistic 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.

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 PHIL 210.

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. Issue oriented. May be cross-listed with SOCI 211.

WOMS 214 Literature and Gender 3

See ENGL 214 for course description.

WOMS 216 Introduction to Feminist Theory 3

See PHIL 216 for course description.

WOMS 233 Women, Biology and Medicine 3

See CSCI 233 for course description.

WOMS 265 Studies: Language 3

See LING 265 for course description.

WOMS 290 History of Women and Education 3

See EDST 290 for course description.

WOMS 298 Race, Ethnicity and Culture 1 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 BAMS 298 and/or SOCI 298.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 299 Research on Women 1 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. May be cross-listed with SOCI 299.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 300 Women in American History 3

See HIST 300 for course description.

WOMS 305 The Evolution of Human Sex Roles and Reproduction 3

See ANTH 305 for course description.

WOMS 307 Sociology of Sex and Gender 3

See SOCI 307 for course description.

WOMS 317 Women in American Society 3

See SOCI 317 for course description.

WOMS 318 Studies in Film 3

See ENGL 318 for course description.

WOMS 323 Introduction to Women and Politics 3

See POSC 323 for course description.

WOMS 324 Topics: French Literature in Translation 3

See FLLT 324 for course description.

WOMS 325 Topics: German Literature in Translation 3

See FLLT 325 for course description.

WOMS 326 Topics: Hispanic Literature in Translation 3

See FLLT 326 for course description.

WOMS 330 Varying Authors, Themes and Movements 3

See FLLT 330 for course description.

WOMS 333 Psychology of Women 3

See PSYC 333 for course description.

WOMS 335 Women and Mental Health 3

Focuses on sociocultural dynamics influencing the psychological development of women, prevalent mental disorders among women and the common types of psychotherapeutic treatment of women.

WOMS 338 Philosophy and Gender 3

See PHIL 338 for course description.

WOMS 350 Women and Criminal Justice 3

See CRJU 350 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 ANTH 363.

WOMS 366 Independent Study 1-6

WOMS 380 Women Writers 3

See ENGL 380 for course description.

WOMS 381 Women in Literature 3

See ENGL 381 for course description.

WOMS 382 Studies in Multicultural Literature in English 3

See ENGL 382 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 CSCI 389 and/or PHIL 389.

RESTRICTIONS: May be repeated for credit when topics vary.

WOMS 392 Honors Colloquium 3

See ARSC 392 for course description. May be cross-listed with PHIL 392.

WOMS 409 Varieties of Modern Feminism 3

See HIST 409 for course description.

WOMS 413 Problems in American Government 3

See POSC 413 for course description.

WOMS 415 Race, Class and Gender 3

See SOCI 415 for course description.

WOMS 416 The American Family 1608-1900 3

See HIST 416 for course description.

WOMS 460 Women in International Development 3

See SOCI 460 for course description.

WOMS 465 Studies in Literature Genres, Types and Movements 3

See ENGL 465 for course description.

WOMS 466 Independent Study 1-6

WOMS 470 Seminar 3

Seminar course on special topics.

PREREQ: WOMS 201.

WOMS 471 Advanced Philosophical Topics 3

See PHIL 470 for course description.

WOMS 473 Studies in Early Modern European History 3

See HIST 473 for course description.

WOMS 484 Women in Sports 3

See PHED 485 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. Biweekly seminar with faculty discusses internship experience in light of academic research and theory.

RESTRICTIONS: Requires permission of instructor.

WOMS 607 Sociology of Sex and Gender 3

See SOCI 607 for course description.