

PHIL 625 Philosophy of Psychology 3(3,0)

Detailed examination of psychology as an autonomous science. Issues include explanation in psychology and cognitive neuroscience, psychology naturalized as a “special science” comparable to biology and geology, evolutionary psychology, philosophy and psychopathology, and moral issues in psychology. *Preq:* Nine hours of psychology or consent of instructor.

PHIL (A A H) 633 Issues in Contemporary Art and Philosophy 3(3,0)

Examines the intersections between recent developments in art and those in philosophy and critical theory. Course content varies, for example, Postmodernism in Art and Philosophy, Themes of Resistance in Contemporary Culture.

PHIL 685 Topics in Philosophy of Biology 3(3,0)

Detailed analysis of a selected topic in philosophy of biology/theoretical biology. Topics may include the levels of selection debate, sociobiology, genetic explanation and genetic causation, the species question, and the history and sociology of biology. *Preq:* Eight hours of biology or consent of instructor.

PHIL 699 Independent Study 1-3(1-3,0)

Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with the faculty member prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

PHIL 845 Aesthetics 3(3,0)

Nature and value of aesthetic experiences and objects. Attention is directed to the roles of and relationships among objects, makers, and audiences; interpretation, criticism, and aesthetic response; the contexts and languages of art; the nature of aesthetic value; aesthetics in application; issues in public policy.

PHYSICS**PHYS 617 Introduction to Biophysics I 3(3,0)**

Introduction to the application of physics to biological problems. Topics include elementary chemical and biological principles, physics of biological molecules, and fundamentals of radiation biophysics. *Preq:* MTHSC 206, PHYS 221, or consent of instructor.

PHYS 620 Atmospheric Physics 3(3,0)

Study of physical processes governing atmospheric phenomena. Topics include thermodynamics of dry and moist air, solar and terrestrial radiative processes, convection and cloud physics, precipitation processes, hydrodynamic equations of motion and large-scale motion of the atmosphere, numerical weather prediction, atmospheric electricity. *Preq:* MTHSC 108, PHYS 208 or 221.

PHYS 621 Mechanics I 3(3,0)

Statics, motions of particles and rigid bodies, vibratory motion, gravitation, properties of matter, flow of fluids. *Preq:* PHYS 221.

PHYS 622 Mechanics II 3(3,0)

Dynamics of particles and rigid bodies, Lagrangian and Hamiltonian formulations, vibrations of strings, wave propagation. *Preq:* PHYS 321 or consent of instructor.

PHYS 632 Optics 3(3,0)

Covers a selection of topics, depending on the interest of the student. Topics may include the formation of images by lenses and mirrors, design of optical instruments, electromagnetic wave propagation, interference, diffraction, optical activity, lasers, and holography. *Preq:* PHYS 221.

PHYS 641 Electromagnetics I 3(3,0)

Study of the foundations of electromagnetic theory. Topics include electric fields, electric potential, dielectrics, electric circuits, solution of electrostatic boundary-value problems, magnetic fields, and magnetostatics. *Preq:* MTHSC 208 and PHYS 221, or consent of instructor.

PHYS 642 Electromagnetics II 3(3,0)

Continuation of PHYS 441. Study of foundations of electromagnetic theory. Topics include magnetic properties of matter, microscopic theory of magnetization, electromagnetic induction, magnetic energy, AC circuits, Maxwell's equations, and propagation of electromagnetic waves. Other topics may include waves in bounded media, antennas, electrodynamics, special theory of relativity, and plasma physics. *Preq:* PHYS 441 or consent of instructor.

PHYS 646 Solid State Physics II 3(3,0)

Continuation of PHYS 645, including selected topics in solid-state physics such as optical properties, superconductivity, noncrystalline solids, dielectrics, ferroelectrics, and nanomaterials. Plasmons, polarons, and excitons are discussed. Brief introduction into methods of solid-state synthesis and characterization tools is presented. *Preq:* PHYS 445 or consent of instructor.

PHYS 655 Quantum Physics I 3(3,0)

Discussion of solution of the Schrodinger equation for free particles, the hydrogen atom, and the harmonic oscillator. *Preq:* PHYS 322 and 441 or consent of instructor.

PHYS 656 Quantum Physics II 3(3,0)

Continuation of PHYS 455. Application of principles of quantum mechanics as developed in PHYS 455 to atomic, molecular, solid state, and nuclear systems. *Preq:* PHYS 455.

PHYS 665 Thermodynamics and Statistical Mechanics 3(3,0)

Study of temperature development of the laws of thermodynamics and their application to thermodynamic systems. Introduction to low temperature physics is given. *Preq:* Six hours of physics beyond PHYS 222 or consent of instructor.

PHYS 811 Methods of Theoretical Physics I 3(3,0)

Analytical methods and techniques used in theoretical physics: vector and tensor analysis as applied to physical problems, use of matrices and groups in classical and quantum mechanics, complex variables, and partial differential equations of physics.

PHYS 812 Methods of Theoretical Physics II 3(3,0)

Continuation of PHYS 811. Use of integral transforms, integral equations, special functions, calculus of variations, and numerical approximations in solutions of physical problems.

PHYS (M E) 815 Statistical Thermodynamics I 3(3,0)

Fundamental principles of kinetic theory and quantum statistical mechanics; Boltzmann statistics, Fermi-Dirac statistics, and Bose-Einstein statistics. *Preq:* A course in thermodynamics or consent of instructor

PHYS 816 Statistical Thermodynamics II 3(3,0)

Generalized ensemble theory and fluctuations; applications to solids, liquids, gases, and blackbody radiation. *Preq:* PHYS (M E) 815.

PHYS 821 Classical Mechanics I 3(3,0)

Dynamics of particles; variational principles and Lagrange's equations; two-body central force problems; dynamics of rigid bodies; matrix formulations freely used.

PHYS 822 Classical Mechanics II 3(3,0)

Special relativity in classical mechanics; Hamilton's equations; canonical transformations; Hamilton-Jacobi theory; small oscillations.

PHYS 841 Electrodynamics I 3(3,0)

Field theory of electromagnetism; Maxwell's equations and their application to study of electromagnetic wave production and propagation; wave optics and theories of interference and diffraction.

PHYS 842 Electrodynamics II 3(3,0)

Production and propagation of electromagnetic waves beginning with use of Maxwell's equations; wave guides; diffraction phenomenon; boundary effects; theory of electrons and microscopic phenomena.

PHYS 845 Solid State Physics I 3(3,0)

Physical properties of crystalline solids; crystalline state determination by diffraction methods; theories of specific heat; properties of metallic lattices and alloys; lattice energy and ferroelectrics.

PHYS 846 Solid State Physics II 3(3,0)

Continuation of PHYS 845. Electronic properties of solids, band theory of solids, physics of semiconductors, theories of magnetism, and magnetic resonance phenomena.

PHYS 875 Selected Topics 1-3(1-3,0)

Students and interested faculty study areas of physics currently being extensively investigated. May be repeated for credit, but only if different topics are covered.

PHYS 890 Directed Activities in Applied Physics 1-6

Training and work on practical problems are supervised by department faculty or by appropriate adjunct professor. Written description of student's activities must be submitted to course supervisor at completion of activity. Maximum credit limits are six credit hours in a semester and three credit hours in a single summer session. To be taken Pass/Fail only.

PHYS 891 Master's Thesis Research 1-12**PHYS 951 Quantum Mechanics I 3(3,0)**

Review of wave mechanics, operator algebra and theory of representation, approximate methods for stationary problems, theory of scattering applied to atomic and nuclear problems.

PHYS 952 Quantum Mechanics II 3(3,0)

Continuation of PHYS 951. Time-dependent perturbations, radiation, absorption and emission, relativistic quantum mechanics, introduction to quantum electrodynamics.

PHYS 966 Relativity 3(3,0) Special and general theory of relativity including tensor calculus, Lorentz transformation and three experimental tests of general theory: planetary motion and advance of perihelion of Mercury, bending of light rays in gravitational fields, and gravitational shift of spectral lines.

PHYS 991 Doctoral Dissertation Research 1-12

PLANT AND ENVIRONMENTAL SCIENCES

PES 825 Seminar 1(1,0) Special topics and original research in plant and environmental sciences. To be taken Pass/Fail only.

PES 826 Scientific Writing 1(1,0) Written communication in the plant sciences. To be taken Pass/Fail only.

PES (CSENV) 850 Agricultural Biotechnology 2(2,0) See CSENV 850.

PES 891 Master's Thesis Research 1-18

PES 991 Doctoral Dissertation Research 1-18

PLANT PATHOLOGY

PL PA (ENT) 606 Diseases and Insects of Turfgrasses 2(2,0) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses; and life histories, diagnosis, and control of important insect pests of turfgrasses. *Preq:* ENT 301, PL PA 310, or equivalent; or consent of instructor.

PL PA (ENT) 608 Diseases and Insects of Turfgrasses Laboratory 1(0,3) Laboratory to complement PL PA (ENT) 406 to learn symptomatology, diagnosis and control of infectious diseases of turfgrasses, and diagnosis of damage caused by important insect pests of turfgrasses. *Preq:* PL PA (ENT) 406.

PL PA 611 Plant Disease Diagnosis I 2(1,2) Methods and procedures used in the diagnosis of plant diseases, especially late spring and early summer diseases. Basic techniques of pure culture and identification of plant pathogens and Koch's postulates are taught. Diagnosis of a wide variety of diseases of cultivated and wild plants is carried out. Offered summer session only. *Preq:* PL PA 310 or equivalent.

PL PA 659 Plant Nematology 3(2,3) Introduction to nematodes emphasizing plant parasitic nematodes. Introduces morphology of nematodes as it relates to their taxonomic position and ability to cause diseases. Includes diagnosis and control of nematode diseases, along with use of nematodes in studies of molecular interaction and genetics involvement in developing resistance. *Preq:* PL PA 310 or consent of instructor.

PL PA 670 Molecular Plant Pathogen Interactions 3(3,0) Study of the interactions of plants and pathogens at the molecular level. Investigates the molecular and genetic components of plant disease and how these can be used for improvement and understanding of how diseases occur and how these can be used for possible disease management. *Preq:* PL PA 310.

PL PA 802 Selected Topics 1-3(1-3,0-6) Current advances in phytopathology and physiology, diseases of specific crops and specialized laboratory protocol. May be repeated for credit. *Preq:* Consent of instructor.

PL PA 804 Plant-Microbe Interactions 3(3,0) Physiology, biochemistry, and genetics of plant-microbe interactions; molecular mechanisms involved in plant-microbe communication, plant colonization, and penetration; development of the microbe within the plant; induction of plant defense responses. Offered fall semester of even-numbered years only. *Preq:* BIOSC 401 and 402 or PL PA 310 or consent of instructor.

PL PA 805 Special Problems in Plant Pathology 1-12 Research not related to a thesis. *Preq:* PL PA 411 or equivalent and consent of instructor.

PL PA 807 Seminar 1(1,0) Areas of plant pathology and plant physiology not covered by formal courses. Relevant literature is reviewed. Material is organized and presented by students. To be taken Pass/Fail only.

PL PA 809 Analytical Techniques in Plant Science 3(2,3) Theory of and practice in current techniques of separation science; hands-on experience with extraction, isolation, and characterization of chemical compounds associated with plants and microorganisms using techniques such as thin layer chromatography, gas chromatography, mass spectrometry, high pressure liquid chromatography, and electrophoresis. *Preq:* Organic chemistry, general biochemistry, or consent of instructor.

PL PA 810 Fungal and Bacterial Plant Pathogens 4(3,3) Biology and molecular biology of plant pathogenic fungi and bacteria; principles of taxonomy, evolution, morphological structures, life cycles, population biology, ecology, control, and genetic manipulation of representative fungal and bacterial pathogens encountered by plant pathologists. *Preq:* PL PA 310, MICRO 305 or equivalent.

PL PA 811 Plant Viruses and Plant Parasitic Nematodes 4(3,3) Biology and molecular biology of plant viruses and plant-parasitic nematodes; taxonomy, evolution, life cycles, population biology, ecology, control, and genetic manipulation of representative viruses and plant-parasitic nematodes encountered by plant pathologists. *Preq:* PL PA 310 or equivalent.

PL PA 813 Fungal Ecology and Pathology 3(2,3) Study of the biology and activities of fungi with emphasis on their interactions with other organisms and roles in natural and managed ecosystems. Includes survey of different types of symbiotic relationships with particular attention to plant pathogens and mycorrhizae and their management. *Preq:* BIOSC 425, 426.

POLICY STUDIES

PO ST 810 Political Economy 3(3,0) Exploration of how public policy can be analyzed within a common framework that considers the objectives and constraints imposed on individuals in political and economic situations, decision rules consistent with these objectives and constraints, and the likely outcomes of various policy objectives. *Preq:* ECON (AP EC) 820 or consent of instructor.

PO ST 822 Policy Analysis and Political Choice 3(3,0) Opportunities and constraints in political systems; political feasibility and policy strategy assessment. Topics include role of power, ideas, organizational interaction, cognitive processes, interest groups, policy analysis, media, and random opportunity in determining policy outcomes. *Preq:* Admission to Policy Studies program or consent of instructor.

PO ST 842 Ethics and Public Policy 3(3,0) Exploration of the ethical dimensions of policy by examining moral and ethical issues raised by problem solving and decision making. Evaluation procedures integrating ethical dimensions into policy assessment. Topics include model codes of ethics for public officials and comparable standards for privately employed policy professionals. *Preq:* Admission to certificate or PhD program in Policy Studies or consent of instructor.

PO ST 843 Organization Theory and Public Management 3(3,0) Theoretical and analytical foundations for understanding bureaucracies and leadership roles in public management; clarification of the distinctly "public" dimensions and challenges of management. Interdisciplinary in nature, course draws on business and public administration, social psychology, economics, political science, and sociology. *Preq:* Admission to certificate or PhD program in Policy Studies or consent of instructor.

PO ST 851 Rural Sustainable Development: Evolution of Public Policy 3(3,0) Formulation of current national and local public policies that impact rural community development; the constraints and opportunities they provide; interaction among government institutions, decision makers, and interest groups; associated influence on rural sustainability. *Preq:* Admission to certificate or PhD program in Policy Studies or consent of instructor.

PO ST 861 Space Policy 3(3,0) Space science technology, civilian and military government programs, and private-sector activities. Case studies of long-term space policy issues impacting remote sensing, communications, and manned space stations. Examination of origins of programs and evolution of associated policy issues from a national and international perspective. *Preq:* Admission to certificate or PhD program in Policy Studies or consent of instructor.

PO ST (C R P) 870 Seminar in Sustainable Development 3(3,0) Concept of sustainable development traced from its historical roots through the popularization of the term in the international development literature; scientific base and the application of sustainability through economic sectors and building practice. Students conduct individual/group research projects.

PO ST 890 Directed Study in Public Policy 3(3,0) Students pursue readings and research in individual public policy topics under the direction of a Policy Studies faculty member. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.

PO ST 893 Internship in Policy Analysis 3(3,0)

Twelve-week supervised internship with an approved public or private entity focusing on policy analysis. Monthly reports by student and agency are required. To be taken Pass/Fail only. *Preq:* Two semesters of coursework in Policy Studies program.

PO ST 898 Policy Analysis Workshop 3(0,6)

Provides experience with contemporary policy issues. Students work in small groups with clients compiling information, developing policy options, and conducting analysis to address a policy issue. White paper is prepared analyzing policy options and making recommendations to policy makers. Typically taken in fourth semester. *Preq:* Three semesters of coursework in Policy Studies program.

PO ST 899 Selected Topics in Policy Studies 3(3,0)

Intensive investigation of selected current and emerging public policy issues emphasizing current literature and results of current research. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.

PO ST 904 Policy Analysis Seminar I 2(2,0)

Seminar module focusing on research methodology with readings and discussion. *Preq:* Three semesters of coursework in Policy Studies program.

PO ST 905 Policy Analysis Seminar II 1(1,0)

Seminar involving student research with articles prepared for a professional audience and presented as part of the seminar. *Preq:* PO ST 904, three semesters of coursework in Policy Studies program.

PO ST 991 Doctoral Dissertation Research 1-18**POLITICAL SCIENCE**

Courses listed in brackets (e.g., PO SC 702 [POLI 502]) are offered by the University of South Carolina for students enrolled in the Master of Public Administration program.

PO SC 609 Directed Study in American Politics

1-3(1-3,0) Supervised reading and/or research in selected areas of American government. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

PO SC 616 Interest Groups and Social Movements

3(3,0) Empirical and normative examination of the origins, roles, and influence of interest groups and social movements in the United States and of the relationships among interest groups, social movements, and democratic theory. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 621 Public Policy 3(3,0)

Introduction to the major approaches to public policy making in American government. Topics include theories and models of policy making, the identification of policy problems, agenda setting, the formulation and adoption of policy, implementation, and program evaluation. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 623 Urban Politics 3(3,0) Examines the nature and scope of politics in urban communities and offers an analysis of urban governance, especially in the interaction of public authority and private institutions in metropolitan areas. Emphasis is on the structure, processes, and problems challenging governments in urban America. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 624 Federalism and Intergovernmental Relations 3(3,0) Introduction to historical, theoretical, legal, and fiscal aspects of constitutionally divided government. Federal, state, and local division of responsibility for public services is emphasized along with the emerging devolution of those responsibilities from the federal government to states and localities. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 627 Public Management 3(3,0) Examination of emerging management problems and issues facing federal, state, and local government and the application of management principles, practices, and techniques of public administration. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 628 National Security Policy 3(3,0) National security threats and policy decision making. Issues covered include weapons of mass destruction, terrorism, organized crime, narcotics, arms control, intelligence, and homeland security. Students deliberate and assess threat priorities and crisis management. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.

PO SC 629 Global Issues 3(3,0) Analysis, assessment, and management of the principal threats facing global security today. Topics include rogue nations, regional superpowers, alliances, organized crime, illegal weapons proliferation, and corruption. Emphasis is on the strategies available to the international community for dealing with these threats. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.

PO SC 637 American Constitutional Law: Rights and Liberties 3(3,0) Examination and analysis of Supreme Court decisions and other legal materials in the areas of civil rights and civil liberties, with an emphasis on freedom of speech, freedom of religion, equal protection of the laws, and privacy rights. *Preq:* Junior standing or consent of instructor.

PO SC 638 American Constitutional Law: Structures of Government 3(3,0) Examination and analysis of Supreme Court decisions and other legal materials in the areas of national power, federalism, the separation of powers, and the role of the judiciary. *Preq:* Junior standing or consent of instructor.

PO SC 642 Political Parties and Elections 3(3,0) Study of the distinctive features of the American two-party system with emphasis on presidential elections. Parties are examined as formal organizations, coalitions of voters and interest groups, coordinators of nomination and election processes, and managers of policy-making institutions. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 654 Southern Politics 3(3,0) Examination of the unique political environment of the American South, with emphasis on the events and social forces which have shaped politics in the region since World War II. Course material is approached from a variety of perspectives, including history, literature, social themes, and political culture. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 657 Political Terrorism 3(3,0) Examination and analysis of the international phenomenon of terrorism in terms of origins, operations, philosophy, and objectives. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.

PO SC 658 Political Leadership 3(3,0) Comparative examination of political leaders focusing particularly on types, methods, and consequences of leadership and on the relationship between leaders and followers. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC 661 American Diplomacy and Politics 3(3,0) Analyzes the process of making and implementing strategies to protect and promote American national interests. Focuses on the role of government agencies and executive-legislative relations, as well as the participation and influence of interest groups and the media. Includes a five-day seminar in Washington, DC. *Preq:* PO SC 363 or consent of instructor.

PO SC 680 Gender and Politics 3(3,0) Examination of the role of gender in politics in the United States and in other countries. Particular emphasis on the role of women in electoral politics, the impact of nationalist violence, and development policies on women's lives, and on women's rights as human rights. *Preq:* PO SC 101, 102, or 104, Junior standing, or consent of instructor.

PO SC (LANG) 685 Global Affairs and Governments 3(3,0) Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics is provided.

PO SC 689 Selected Topics 1-3(1-3,0) Intensive examination of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.

PO SC 702 [POLI 502] Research Methods for Public Administration 3(3,0) Use of social science research methods for addressing issues in public management and policy; research design; measurement; sampling and polling; various aspects of locating, collecting, and processing data, including survey design and archive searches.

PO SC 821 [POLI 770] Perspectives on Public Administration 3(3,0) Study and practice of public administration in the United States in the 20th century; historical development of the field of public administration; current approaches to the study and practice of public administration.

PO SC 822 [POLI 774] Public Policy Process 3(3,0) Major models of policy making including incrementalism, rationalism, pluralism, and elitism; selected areas of public policy including transportation, poverty, energy, and the environment.

PO SC 827 [POLI 773] Public Personnel Administration 3(3,0) Organization, techniques and theories of personnel management; interpersonal relations in organizations; personnel change and development; changing conditions in the public service; educational specializations, unions, collective bargaining, etc.; ethics for the public service.

PO SC 829 [POLI 775] Public Financial Management 3(3,0) Organization and techniques of governmental financial management; budgetary theories; intergovernmental financial relations.

PO SC 830 Constitutional Law for Public Administration 3(3,0) Principles of American constitutional law; legal issues related to public administration including delegation of power, separation of powers, due process, and civil rights and liberties. May not be taken for credit by students who have taken PO SC 632 or 633 or their equivalents.

PO SC 834 Administrative Law 3(3,0) Legislative, adjudicatory, and general policy-making powers of administrative agencies and regulatory commissions; the scope of judicial review of administrative action. Directed primarily toward the analysis of the political nature of bureaucracy.

PO SC 841 [POLI 771] Public Data Analysis 3(3,0) Various aspects of database management, storage, and retrieval; data description; univariate, bivariate, and multivariate analysis in policy studies and decision-making theory. *Preq:* EX ST 301, MTHSC 301, or equivalent.

PO SC 860 [POLI 761] American Government 3(3,0) Literature of the American political system, its institutions and processes.

PO SC 862 Administrative Leadership 3(3,0) Foundations of leadership in public organizations; personal and organizational values underlying decision processes in the public service.

PO SC 863 [POLI 772] Contemporary Administrative Organizations 3(3,0) Problems, processes, and theories of communication, decision-making, agency planning, and control in administrative agencies.

PO SC 867 State Government Administration 3(3,0) State government problems and policy issues emphasizing the modernization of government institutions and comparative state politics.

PO SC 868 [POLI 768] Local Government Administration 3(3,0) Administration of local government from the perspective of the professional administrator; the growth of the manager form of local government; the role of local government administrators with regard to policy making, management, and the delivery of services.

PO SC 877 [POLI 777] Public Policy Evaluation Seminar 3(3,0) Conceptual and analytic issues in policy and program evaluation including problem definition, goal setting, and criteria formulation; design of evaluation research; indicator design; treatment of uncertainty; and special problems raised by constraints of the political context.

PO SC 878 [POLI 778] Selected Topics in Public Administration 3(3,0) In-depth study of an applied problem in public administration as seen through the practitioner's eyes; the methods used to address these problems.

PO SC 879 [POLI 779] Internship in Public Administration 1-3(1-3,0) Internship with a government agency requiring a written report detailing the experience.

PO SC 880 [POLI 753] Capstone Seminar in Public Administration 3(3,0) Term project integrating the material from other courses in the analysis of a contemporary public administration problem. Field work and applied project required. *Preq:* Thirty credit hours toward MPA degree and consent of instructor.

POLYMER AND FIBER CHEMISTRY

PFC 615 Introduction to Polymer Science and Engineering 3(3,0) Chemistry of monomers and polymers and the chemical and physical properties of polymers are discussed emphasizing fiber forming, synthetic polymers. Includes molecular characterization, structure, morphology, and mechanical properties as they relate to the design of polymer systems for end uses in textiles, geotextiles, plastics, and fiber-reinforced composite materials. *Preq:* CH 201; 224 or 330; PFC 304; or consent of instructor.

PFC 616 Chemical Preparation of Textiles 3(2,3) Chemicals used in the preparation of fabric for dyeing and finishing. Oxidizing and reducing agents and their control and effect on various fibers. Colloidal and surface active properties of various compounds and the fundamental factors influencing these properties.

PFC 657 Dyeing and Finishing I 3(3,0) Physical, chemical, and mechanical principles behind the application of colors and finishes to textiles. Requires an appreciation of fiber chemistry and morphology, dye and finish structures, and reactivity and mechanical principles behind the equipment used to effect transfer of these chemicals onto the textile substrate.

PFC 658 Dyeing and Finishing II 3(3,0) Kinetics and equilibria of dyeing processes. The use of conductivity, diffusion, and other methods for measuring absorption of isotherms and dyeing rates and the general thermodynamic relationships applicable to dyeing operations. Fiber properties such as zeta potential, dye site, and relative amorphous area available are included.

PFC 661 Surface Phenomena in Fiber Science 3(3,0) Introduction to surface phenomena focusing on fiber science. Fundamentals of interfacial phenomena embrace thermodynamics of surfaces, physics of adhesion, wetting, and finishing emphasizing specific features associated with interactions of liquids and chemicals with fibers and fibrous materials. *Preq:* Junior standing in engineering or science.

PFC 811 Polymer Science I 3(3,0) Fundamentals of polymer chemistry. Chemistry and synthesis of monomers and polymers in relation to thermodynamics, kinetics, and mechanisms of polymerization reactions emphasizing fiber-forming polymers, plastics, and composite matrix materials. Offered fall semester only.

PFC 812 Polymer Science II 3(3,0) Chemical structure and properties of polymers. Polymer solution properties, the viscoelastic state, and the crystalline morphology of polymeric materials. Current theories for describing polymer thermal transitions, molecular weight, molecular weight distributions, and transport phenomena in polymeric systems, as well as interfacial phenomena. Offered spring semester only.

PFC 830 Multicomponent Polymeric Materials 3(3,0) Principles of advanced multicomponent polymeric materials and systems based on the following topics: different polymer-polymer and polymer-nonpolymer combinations; multicomponent materials synthesis, fabrication, properties, and applications; modification and instrumental characterization of polymer surfaces and interfaces; functional coatings, nanocomposites, adhesives, nanodevices, polymer blends and composites, interpenetrating polymeric networks, and block-copolymers. *Preq:* Introductory polymer course or consent of instructor.

PFC 840 Analytical Methods in Textile and Polymer Science 4(3,3) Use of chemical and physical instrumental methods to characterize polymeric materials in textile and polymer science; basic principles and unique problems encountered when techniques such as IR, NMR, GC, LC, MS, GC/MS and thermal analysis, microscopy, and tensile testing are applied to polymeric materials. Offered spring semester only. *Preq:* Consent of instructor.

PFC 891 Master's Thesis Research 1-12

PSYCHOLOGY

PSYCH 626 Advanced Physiological Psychology 3(3,0) Advanced studies in the biological basis of behavior with emphasis on functional neuroanatomy and endocrinology. Topics may vary. May not be repeated for credit. *Preq:* PSYCH 324 or consent of instructor.

PSYCH 662 Psychology and Culture 3(3,0) Seminar examining the cultural context in which psychological theories and research are generated and psychological perspectives on human diversity. Topics include the philosophical positions influencing psychological theory and research; methodological issues in the study of diversity; historical and contemporary perspectives; and cross-cultural psychological research in selected content areas. *Preq:* PSYCH 310 or consent of instructor.

PSYCH 680 Health Psychology 3(3,0) Study of the role of health-related behaviors in the prevention, development, and/or exacerbation of health problems. Emphasis is on the biopsychosocial model and its application in the assessment, treatment, and prevention of health problems. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course or consent of instructor.

PSYCH 683 Abnormal Psychology 3(3,0) Introduction to the diagnosis and treatment of mental illness. Uses current diagnostic standards for mental disorders as a framework for understanding the symptoms, causes, and treatments of the most commonly observed maladaptive behaviors. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course or consent of instructor.

- PSYCH 689 Selected Topics 3(3,0)** Seminar in current topics in psychology. Topics vary from semester to semester and are announced prior to each semester's registration. May be repeated once for credit, but only if different topics are covered. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course or consent of instructor.
- PSYCH 810 Research Design and Quantitative Methods I 3(3,0)** Overview of applied data analysis in industrial and other work-related settings. Analysis techniques focus on the General Linear Model approach to ANOVA and regression. *Preq:* Six credits of statistics, research methods or equivalent.
- PSYCH 811 Research Design and Quantitative Methods II 3(3,0)** Research methodologies; experimental, quasi-experimental, and nonexperimental designs emphasizing applied psychological research; scientific method; basic versus applied research; technical writing; grant writing and ethics. *Preq:* PSYCH 810.
- PSYCH 813 Research Design and Quantitative Methods III 3(3,0)** Advanced course in applications of multivariate data analysis in industrial and other work-related settings. Topics include the major advanced and multivariate data analytic tools needed for research in applied psychology. *Preq:* PSYCH 810 or consent of instructor.
- PSYCH 815 Advanced Studies in Systems and Theories 3(3,0)** Foundations of contemporary psychology, origins of major theories, conceptions of scientific knowledge implicit in them, and reasons for accepting or rejecting them. *Preq:* PSYCH 415 or consent of instructor.
- PSYCH 822 Human Perception and Performance 3(3,0)** Basic research on human perception as applied to task performance; vision and audition in adults; basic knowledge of human sensory and perceptual characteristics as applied to such tasks as machine operation, task performance, etc.
- PSYCH 823 Perception, Cognition, and Technology 3(3,0)** Fundamentals of sensory and perceptual processes focusing on human vision and audition. Emphasis is on perceptual aspects of applications and communication in electronic and traditional media. Topics include perception of speech, time, depth, color, and motion in natural and virtual environments, as well as psychophysics, attention, eye movements, and reading. *Preq:* Enrollment in MFAC degree program or consent of instructor.
- PSYCH 833 Advanced Cognitive Psychology 3(3,0)** Research and theory concerning perception, memory, reasoning, problem solving, knowledge representation, psychology of language, semantics, attention, concept formation, and other high-level mental processes. Applications of these areas are considered.
- PSYCH 835 Advanced Human Factors Psychology 3(3,0)** Foundation from which to study interactions between human beings and systems in order to maximize safety, performance, and user satisfaction. Integration and application of basic research and theory in sensation, perception, cognition, and motor control. *Preq:* Consent of instructor.
- PSYCH 837 Ergonomics for Applied Psychology 3(3,0)** Perception and action capabilities of humans as they relate to the design of machines and environments; biomechanics, anthropometry, human movement and work, and the perceptual supports action.
- PSYCH 840 Usability Analysis and Crew Assessment 3(3,0)** Hands-on exposure to human factors methods for evaluating the usability of computer interfaces and assessing team performance in fast-paced tasks. May include cognitive task analysis, heuristic evaluation, usability testing, sequential data analysis, cognitive modeling, workload and situation-awareness measurement, measurement of team knowledge, operating simulators. *Preq:* PSYCH 810 or 835 or consent of instructor.
- PSYCH 845 Advanced Studies in Adulthood and Aging 3(3,0)** Human development from young adulthood through late adulthood. Biological, cognitive, personality development, and social development are examined from the perspective of several major theoretical frameworks. *Preq:* PSYCH 345 or consent of instructor.
- PSYCH 852 Advanced Studies in Social Psychology 3(3,0)** Human social behavior from the perspective of the individual as a participant in social relationships; contemporary theories of human social behavior and human behavior in social settings. *Preq:* PSYCH 352 or consent of instructor.
- PSYCH 860 Psychology of Training and Evaluation 3(3,0)** Evaluation issues such as criteria development, organizational assessment, process, and outcome criteria along with instructional methodologies such as fairness in training, special populations, second careers, hard-core unemployment, and ethics of organizational and industrial change. *Preq:* A course in industrial psychology, personnel psychology, or equivalent.
- PSYCH 861 Personnel Psychology 3(3,0)** Theory, techniques, and legal issues involved in the effective matching of individuals' needs, preferences, skills, and abilities with the needs and preferences of organizations. Topics include research methods, prediction issues, tests and other predictors, decision making, and job evaluation. *Preq:* PSYCH 810.
- PSYCH 862 Organizational Psychology 3(3,0)** Investigation of forms of organizational structure and basic theories of organizations. Includes research and theories on human behavior in organizations including motivation, leadership, and job satisfaction. Discusses relationships between theories and research on human behavior and organization development and change. *Preq:* A course in industrial/organizational psychology or equivalent.
- PSYCH 863 Work Motivation and Satisfaction 3(3,0)** Explanations for absenteeism, productivity, job satisfaction, and withdrawal, as well as their interrelations. Methods of measuring attitudes and opinions and general theories of human motivation. *Preq:* A course in industrial/organizational psychology or equivalent.
- PSYCH 864 Performance Appraisal 3(3,0)** Job measurement and the psychological processes involved in performance appraisal. Current methods, theory, and applications in the measurement of job performance. Training in the development and evaluation of performance appraisal systems. *Preq:* PSYCH 364 or consent of instructor.
- PSYCH 866 Attitude Measurement Theory 3(3,0)** Classic and contemporary approaches to attitude theory, measurement, and scaling techniques. Theories of job satisfaction. Measurement of attitudes toward work. *Preq:* PSYCH 471 or consent of instructor.
- PSYCH 867 Legal Issues in Personnel 3(3,0)** Discrimination law and its relevance to the practice of industrial/organizational psychology. Compliance with Title 7, the Age Discrimination in Employment Act, and the Americans with Disabilities Act. *Preq:* PSYCH 861 and 871 or consent of instructor.
- PSYCH 868 Leadership in Organizations 3(3,0)** Theories of leadership and current leadership research. Theoretical approaches include trait, behavioral, contingency, transactional, and transformational approaches. Current leadership issues may include leadership perceptions, gender and leadership, and executive succession. *Preq:* A course in industrial/organizational psychology or equivalent.
- PSYCH 869 Advanced Personnel Selection 3(3,0)** Advanced seminar covering details of personnel selection techniques used in organizations. Techniques covered may include biodata, cognitive and physical ability tests, personality tests, interviews, and assessment centers. *Preq:* PSYCH 861.
- PSYCH 871 Psychological Tests and Measurement 3(3,0)** Advanced survey of psychological test development, evaluation, and utilization in organizational and research settings; professional guidelines for the practice of testing in industrial/organizational psychology and legal guidelines for using tests in industry. *Preq:* Consent of instructor.
- PSYCH 873 Structural Equation Modeling in Applied Psychology 3(3,0)** Fundamentals of the statistical techniques involved in structural equation modeling (SEM) in applied psychology. SEM is a regression-based technique that incorporates elements of path analysis, confirmatory factor analysis, and structural models. *Preq:* PSYCH 810 or consent of instructor.
- PSYCH 882 Survey of Occupational Health Psychology 3(3,0)** Issues in the newly developing field of occupational health psychology; integration of knowledge bases from human factors, industrial-organizational, health psychology, and related disciplines; biopsychosocial perspective where students develop problem-solving skills and interdisciplinary knowledge. *Preq:* Prior psychology coursework or consent of instructor.
- PSYCH 883 Advanced Studies in Abnormal Psychology 3(3,0)** Seminar on the etiology and classification of abnormal behavior; empirical and theoretical issues in the understanding of mental disorders; cultural influences on judgment of abnormality; in-depth examination of specific psychological disorders. *Preq:* PSYCH 483 or consent of instructor.

PSYCH 885 Organizational Stress 3(3,0) Considers stressors in the workplace that have the capacity to undermine an individual's well-being and performance. Addresses comprehensive models of organizational stress, methodological challenges in studying workplace stress, factors that reduce the negative impact of stress, and organizational interventions to reduce the negative consequences.

PSYCH 891 Master's Thesis Research 1-3

PSYCH 895 Applied Psychology Internship 3-6(0,3-6) Supervised field experience in industry, business, or government. Site location, on-site supervision, and credit hours must be approved in advance by graduate coordinator.

PSYCH 897 Special Problems in Applied Psychology 1-3 Study of a particular topic under the direction of a faculty member. Specific program is organized by student and faculty member and submitted to graduate coordinator for approval. Project is not used to support MS thesis or dissertation. May be repeated for a maximum of 21 credits.

PSYCH 899 Selected Topics 3(3,0) Selected current and classic topics not covered in other courses. May be repeated for credit.

PSYCH 991 Doctoral Dissertation Research 1-9

READING

READ 860 Reading Instruction in the Elementary School 3(3,0) Knowledge and skills necessary for teaching reading to varied types of elementary school learners. *Preq:* Consent of instructor.

READ 861 Fundamentals of Basic Reading 3(3,0) Historical progression of the teaching of reading; current theories and reading practices; teaching basic reading skills.

READ 862 Clinical Research in Reading 3(3,0) Reading research and literature; original investigation in such problems as development of reading skills and attitudes, clinical procedures, and techniques is required. *Preq:* READ 861.

READ 863 Organizing and Supervising Reading Programs 3(3,0) Supervisory problems with planning reading programs; analysis of methods and materials of teaching; evaluation of reading programs. *Preq:* One of the following: READ 860, 861, 864, 865, 869.

READ 864 Teaching Secondary School Reading 3(3,0) Methods and materials for secondary reading programs in developmental, corrective, remedial, adapted, content, and recreational areas.

READ 865 Evaluation and Remediation of Reading Problems 3(2,3) Remedial methods and materials for teaching reading; use of diagnostic instruments and interpretation of test results. Students participate in laboratory/field experience and prepare case studies with summary of diagnosis emphasizing remediation procedures. *Preq:* READ 860, 861, or 864.

READ 866 Practicum in Reading 3(2,2) Supervised practicum emphasizing diagnostic and remedial work with readers in public schools. *Preq:* READ 865, consent of instructor.

READ 867 Middle School Reading 3(3,0) Techniques, materials, and theories for teaching reading to middle school students emphasizing correlating reading skills into the content area. *Preq:* Education major or consent of instructor.

READ 868 Using Literature and Technology for Reading Instruction 3(3,3) Provides early childhood, elementary, and middle school teachers with theory and knowledge needed to utilize technological and library resources and make appropriate literature selections for the teaching of reading.

READ 869 Integrated Approach to Reading and Writing Instruction 3(3,0) Understanding of the reading/writing processes for early childhood and elementary teachers; investigation of the whole language approach in the classroom. *Preq:* READ 861 or equivalent.

READ 870 Early Literacy: Strategic Reading and Writing Instruction 3(3,0) Use of the theoretical base of the Reading Recovery program to modify instructional practices to include generalizable instructional procedures. *Preq:* READ 860 or equivalent.

READ 871 Literacy Across the Curriculum 3(3,0) Use of the theoretical base of the Reading Recovery program to modify instructional practices to include reading and writing activities in all aspects of K-5 curriculum. *Preq:* READ 860 or equivalent and 870.

READ 872 Guided Reading and Guided Writing 3(3,0) Use of the techniques of Guided Reading, Shared Writing, and Interactive Writing appropriately in classroom situations. Demonstration of how the difficulty level of teaching practice must change over time as students move from dependence on assistance to independence during the reading and writing processes. *Preq:* READ 860 or equivalent and 871.

READ 873 Models for Balanced Literacy 3(3,0) Prepares classroom teachers to organize K-5 classrooms for balanced literacy instruction. Participants apply classroom organization procedures in actual K-5 classrooms. *Preq:* READ 860 or equivalent, 865, and 872.

READ 874 Principles and Strategies for Teaching English Speakers of Other Languages 3(3,0) Helps participants develop culturally and linguistically responsive classrooms with instructional strategies for teaching the language acquisition process within the context of academics supportive of English language learners (ELLs) and their learning needs. *Preq:* Graduate standing in Education or consent of instructor.

READ 880 Reading Recovery Teacher I 3(3,0) First in a two-semester, two-course sequence designed to prepare teachers to implement and teach a Reading Recovery Program. Issues related to reading theory and process, instructional processes, program implementation, and evaluation. *Preq:* Consent of instructor. *Coreq:* READ 882.

READ 881 Reading Recovery Teacher II 3(3,0) Second in a two-course sequence designed to prepare teachers to implement and teach in a Reading Recovery Program. Issues related to reading theory and process, instructional process, program implementation, and evaluation. *Preq:* Admission into the Clemson Reading Recovery Program, READ 880, 882. *Coreq:* READ 883.

READ 882 Reading Recovery Teacher Practicum I 3(0,9) Teaching experience allowing teachers to develop and practice responsibilities of implementing and teaching first grade children in a Reading Recovery program. Participants implement content studied in READ 880. *Preq:* Consent of instructor. *Coreq:* READ 880.

READ 883 Reading Recovery Teacher Practicum II 3(0,9) Teaching experience and practice in implementing and teaching in a Reading Recovery Program. Participants implement content studied in READ 881. *Preq:* Admission into the Clemson University Reading Recovery Program, READ 880, 882. *Coreq:* READ 881.

READ 884 Reading Recovery Clinical I 3(3,0) First in a two-course sequence aimed at providing leadership experiences in implementing a Reading Recovery Program in an elementary school setting. *Preq:* Admission into the Clemson University Reading Recovery Teacher Leader program. *Coreq:* READ 886, 937.

READ 885 Reading Recovery Clinical II 3(3,0) Second in a two-course sequence to provide leadership experiences in implementing a Reading Recovery Program in an elementary school setting. *Preq:* Admission into the Clemson University Reading Recovery Teacher Leader program. *Coreq:* READ 887, 938.

READ 886 Reading Recovery Teacher Leader Practicum I 3(0,9) First in a two-course sequence designed to prepare Reading Recovery Teacher Leaders to implement a school-based program, supervise teachers, and carry out responsibilities related to maintaining a Reading Recovery site. *Preq:* Admission into the Clemson University Reading Recovery Teacher Leader program. *Coreq:* READ 884, 937.

READ 887 Reading Recovery Teacher Leader Practicum II 3(0,9) Second in a two-course sequence designed to prepare Reading Recovery Teacher Leaders to implement a school-based program, supervise teachers, and carry out responsibilities related to maintaining a Reading Recovery site. *Preq:* Admission into the Clemson University Reading Recovery Teacher Leader program. *Coreq:* READ 885, 938.

READ 937 Reading Recovery Theory I 3(3,0) First of a two-course sequence designed to examine theoretical principles of the reading process as applied in the Reading Recovery Program. Issues related to program implementation and systematic program changes. *Preq:* Consent of instructor. *Coreq:* READ 884, 886.

READ 938 Reading Recovery Theory II 3(3,0) Second of a two-course sequence designed to examine theoretical principles of the reading process as applied in the Reading Recovery program. Issues related to program implementation and systematic program changes. *Preq:* Consent of instructor. *Coreq:* READ 885, 887.

READ 939 Theoretical Models of Reading 3(3,0) Psychological basis of the reading process; principles applied in teaching reading. *Preq:* READ 860 or 861 or consent of instructor.

READ 940 Advanced Diagnosis and Remediation in Reading 3(2,3) Advanced diagnosis and remediation in reading; review of diagnostic instruments and instructional materials. *Preq:* READ 860 or 861; 865; or consent of instructor.

READ 941 Advanced Practicum in Reading 3(2,3) Diagnosis and remediation testing; remediation. Extensive case studies with recommendation for the classroom teacher are required. *Preq:* READ 940 and consent of instructor.

READ 942 Teaching Reading Through a Literature Emphasis 3(3,0) Strategies for integrating literature into the traditional reading program. *Preq:* An introductory reading class or equivalent.

READ 943 The Reading-Writing Connection: An Integrated Approach 3(3,0) Theoretical bases and practical techniques for teaching reading and writing in an integrated manner; reading and writing as processes; basic skills instruction in a coordinated program; multiple subject areas; use of student interest and ability. *Preq:* Basic reading methods course.

READ 944 Reading Research: Review and Critique of the Literature 3(3,0) Historical and contemporary research in reading and related literacy fields. *Preq:* Admission to the PhD program in Curriculum and Instruction.

READ 945 Special Problems in Reading Education 3(1,4) Individual study of a specific topic in reading. Students may choose from a large diversity of topics. *Preq:* READ 860 or 861; READ 862, 865, ED F 808; or consent of instructor.

REAL ESTATE DEVELOPMENT

RED 800 Real Estate Development Process 3(3,0) Real estate and land development process from the developer's perspective. Cases and lectures are presented by leading experts in the development industry. Emphasizes participants of the development team and how to become a developer/"master builder" to create a superior built environment. *Preq:* Consent of instructor.

RED 801 Real Estate Market Analysis 3(3,0) Processes and data sources used to analyze the supply and demand for various building types. Explores demographic, technological, and economic trends affecting markets. General market analysis supply and demand approaches, including the use of GIS, are developed and applied primarily to residential, retail, and office markets at specific sites. *Preq:* Consent of instructor.

RED 802 Real Estate Development Field Tour Seminar 3(0,9) Examines the processes of creating quality development within the risk-reward framework focusing on design feasibility from the perspectives of the development team. Approximate two-week tour of the South Carolina Coast or other environs visits approximately forty developments and the key actors involved. To be taken Pass/Fail only. *Preq:* MRED student or consent of instructor.

RED 803 Public-Private Partnership Development 3(3,0) Focuses on public-private partnerships in the structuring, negotiating, and implementing the design, development, construction, and management of buildings and areas. Emphasis is on redevelopment/rehab and infill development; incentive tools and techniques, and market and feasibility issues for development within the risk-reward framework. *Preq:* RED 800 and consent of instructor.

RED 804 Practicum in Residential and Master Planned/Resort Communities 3(3,0) Exploration of the residential development process, especially for large-scale subdivisions and master planned/resort communities. Guest speakers, case studies, and field visits are used. Capstone preliminary feasibility analysis for a real world proposed development is completed by diverse student teams. *Preq:* Consent of instructor.

RED 805 Practicum in Commercial Development 3(3,0) Exploration of the commercial development process, especially for office and retail properties. Guest speakers, case studies, and field visits are used. Capstone preliminary feasibility analysis is completed by diverse student teams for a real world proposed development. *Preq:* Consent of instructor.

RED 810 Real Estate Seminar Roundtable 1(1,0) Weekly course which brings students and premier real estate professionals together through on-site or videoconference sessions. Presentations and discussions occur regarding cutting-edge projects and industry issues from around the country and internationally. May be repeated for a maximum of two credits. To be taken Pass/Fail only. *Preq:* Enrollment in MRED program or consent of instructor.

RED 811 Summer Internship in Real Estate Development 3(0,9) Preplanned, preapproved, faculty-supervised internship designed to give students on-the-job learning in support of classroom education. Internships must be no less than ten full-time, consecutive weeks with same internship provider. Ancillary study abroad experience or two, three-credit classes in place of internship requirement are possible with approval of MRED Director. To be taken Pass/Fail only.

RED 889 Selected Topics 3(3,0) Topics emphasizing current literature and results of current research. May be repeated for a maximum of nine credits, but only if different topics are covered. *Preq:* Consent of instructor.

RED 890 Directed Study 1-3(0,3-9) Students pursue individual professional interests under guidance of individual faculty as approved by MRED Director. Offered for elective credit for students in MRED program. May be repeated for a maximum of six credits.

RELIGION

REL 601 Studies in Biblical Literature and Religion 3(3,0) Critical examination of a selected topic in biblical studies. Topics vary from year to year. May be repeated once for credit. *Preq:* Consent of instructor.

REL 602 Studies in Religion 3(3,0) Thorough examination of a selected topic in one or more of the religious traditions of the world or of religious life in a particular region. Topics vary from year to year. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

REL 604 History of Early Christianity 3(3,0) Study of the history, social and doctrinal, of early Christianity up to 600 A.D. *Preq:* Consent of instructor.

REL 635 Religious Institutions in Community Life 3(3,0) Explores the particular significance of religious organizations as core institutions in American communities and examines their involvement with community political and social structures.

RHETORICS, COMMUNICATION, AND INFORMATION DESIGN

RCID 801 Histories of Rhetorics 3(3,0) Details historical beginnings from preplatonics, Sophists, Plato, Aristotle to early work of K. Burke (c. 1940). Attention is given to primary-secondary works, including historiographical principles of rhetorics, "the sister arts" (ut pictura poesis, ecphrasis), and techne (as human faculty and mechanical technology). *Preq:* RCID major or consent of instructor.

RCID 802 Cultural Research Methods 3(3,0) Continuation of RCID 801, from 1940 to the present. Focuses on rhetorical inventions as traditional memory and innovative counter-memory. Includes such theorists as K. Burke, G. Ulmer, and P. Miller. Includes algorithmic, heuristic, aleatory procedures; classical, modern, postmodern topoi and ethnographies/grammatologies; gestural, oral (aural), literate, and electratae logics; graphic/filmic collage-montage; "rhythm science," and sampling-remixing. *Preq:* RCID 801.

RCID 803 Empirical Research Methods 3(3,0) Study of assumptions-applications of empirical method in research. Includes sampling techniques, measurement, reliability, validity in collecting-analyzing data, using parametric-nonparametric statistical procedures. Considers approaches to content studies as well as survey and quasi-experimental research. Discusses philosophic writings of scholars such as Popper and Kuhn and content-specific work of Lazarsfeld, Lasswell, Hovland, among others. *Preq:* RCID major or consent of instructor.

RCID 804 Visual Rhetorics 3(3,0) Examines post-1945 modes of visual rhetoric and differing critical perspectives on their functions. Attention is given to key texts and visual creations to gain awareness of how visual codes operate in interior worlds and public life. Topics include the Challenge of Abstraction, Culture of Display, Body as Marketing Tool. *Preq:* RCID major or consent of instructor.

RCID 805 Rhetorics, Communication, Information Technologies 3(3,0) Hands-on examination of communication technologies used widely in academic and industry settings. Focuses on such intermedia as audio, video, Web, MOOs, Blogs, serious computer games, and all emerging technologies. *Preq:* RCID major or consent of instructor.

RCID 810 Pedagogy, Administration, and Assessment 3(3,0) Theory and praxis of professional communication in academic instruction and selected methods of pedagogical and programmatic assessment. Emphasizes communication-intermedia across the curriculum, academic program administration, and scholarship of teaching and learning. May be repeated for a maximum of six credits. *Preq:* RCID major or consent of instructor.

RCID 811 Perspectives in Information Designs 3(3,0) Offers multiple historical and theoretical perspectives for designing and presenting information in visual, oral, print, and digital media. Students apply humanistic-rhetorical models to these media and design multimedia projects that demonstrate transactions among theoretical perspectives. May include such models as homeostasis, autopoiesis, and virtuality. *Preq:* RCID major, RCID 801, or consent of instructor.

RCID 812 Cultural Critiques of Mechanical Reproductions 3(3,0) Study of critiques and ethics of simulation and sham realities, balanced with counter-critiques/counter-ethics. Considers the “death” of reality and the birth of third order “virtualities.” May include such theorists and commentators as Plato, W. Benjamin, M. Heidegger, J. Baudrillard, R. Barthes, P. Virilio, K. Hayles, A. Fausto-Sterling, F. Kittler, G. Deleuze, A. Ronell, M. Taylor. *Preq:* RCID major or consent of instructor.

RCID 813 Special Topics 3(3,0) Study of varying topics determined by such rubrics as history, method, criticism, place, time, subjectivity, models, memory, styles; or determined by such permutations and combinations of rubrics as ethos-gender-sex, theory-practice, rhetoric-poetics, politics-poetics, techne-technology, cultural-digital studies, analog-digital. May be repeated for a maximum of nine credits, but only if different topics are covered. *Preq:* RCID 802, 803, or consent of program director.

RCID 831 Independent Research and Study 3(3,0) Supervised reading in areas and concentrations where there is no comparable seminar or coursework. May be repeated for a maximum of nine credits. *Preq:* RCID 802, 803, 804, 805, five RCID cognate seminars, and consent of program director and chair of advisory committee.

RCID 833 Graduate Readings 3(3,0) Independent research/study focusing on preparation of dissertation project, with two support areas. May be repeated for a maximum of nine credits. *Preq:* RCID 802, 803, 804, 805, five RCID cognate seminars, and consent of program director and chair of advisory committee.

RCID 880 Applied Experience in Research and Communication in Studio 3(3,0) Students apply their seminar work systematically to individual research projects in a primary area and two support areas. Includes an introduction to applied research in a variety of places, both actual and virtual (archives, labs, studios), and to ever-changing notions of intellectual property and creative commons. May be repeated for a maximum of six credits. *Preq:* RCID 802, 803, 804, 805, four RCID cognate (elective) seminars.

RCID 991 Doctoral Dissertation Research 1–18

RURAL SOCIOLOGY

R S (SOC) 601 Human Ecology 3(3,0) Analysis of the interrelationships among the physical world, modifications in natural environments, human settlement patterns, and institutions that both encourage and regulate environmental modification. Emphasis is on conditions whereby natural resources become public policy concerns. Offered spring semester only. *Preq:* Sophomore standing.

R S (SOC) 659 The Community 3(3,0) Close analysis of the development of contemporary communities and their place in society. Continuing effects of industrialization, migration, and technological change on community location and structure are examined. Structural relations of social class, status, and the associations among institutions are explored.

R S (SOC) 671 Demography 3(3,0) See Soc 671.

R S 881 Special Problems in Rural Social Research 1-3(0,2-6) Recent research problems and literature emphasizing research design, analysis, theoretical generalizations, and application programs. May be repeated for a maximum of six credits. *Preq:* Six credit hours of 600-level sociology or rural sociology courses or consent of instructor.

SECONDARY EDUCATION

EDSEC 637 Technology in Secondary Mathematics 3(3,0) Students learn how to integrate calculators, data collectors, and computers in the secondary mathematics curriculum. They solve problems from middle school, Algebra I, Geometry, and Algebra II courses. *Preq:* Second semester Junior standing, admission to the professional level.

EDSEC 765 Secondary School Curriculum 3(3,1) Principles, techniques, and trends in secondary school curriculum development and evaluation.

EDSEC 770 Science Laboratory and Field Instruction 3(3,0) Methods of designing and conducting laboratory and field learning activities in secondary science courses. *Preq:* Undergraduate science teaching methods course or consent of instructor.

EDSEC 803 Advanced Methods of Teaching in the Secondary School 3(3,1) Principles and practices involved in promoting effective active learning in secondary schools.

EDSEC 811 Middle Grades Language Arts Methods/Practicum 3(2,4) Development of instructional practices appropriate for middle grades language arts teachers; familiarization with curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 812 Middle Grades Social Studies Methods/Practicum 3(2,4) Development of instructional practices appropriate for middle grades social studies teachers; familiarization with curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 813 Middle Grades Math Methods/Practicum 3(2,4) Development of instructional practices appropriate for middle grades mathematics teachers; familiarization with curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 814 Middle Grades Science Methods/Practicum 3(2,4) Development of instructional practices appropriate for middle grades science teachers; familiarization with curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 821 Middle Grades Language Arts Methods/Student Teaching 3(2,4) Continued development of instructional practices appropriate for middle grades language arts teachers; familiarization with additional curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 822 Middle Grades Social Studies Methods/Student Teaching 3(2,4) Continued development of instructional practices appropriate for middle grades social studies teachers; familiarization with additional curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 823 Middle Grades Math Methods/Student Teaching 3(2,4) Continued development of instructional practices appropriate for middle grades math teachers; familiarization with additional curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 824 Middle Grades Science Methods/Student Teaching 3(2,4) Continued development of instructional practices appropriate for middle grades science teachers; familiarization with additional curriculum materials. Includes field work in local schools. *Preq:* Admission to MAT program.

EDSEC 841 Advanced Studies in the Teaching of Secondary School English 3(3,1) Methods of teaching secondary school English based on research and review of current literature. *Preq:* EDSEC 424 or equivalent, master's degree, or consent of instructor.

EDSEC 842 Advanced Studies in the Teaching of Secondary School Mathematics 3(3,1) Relationship between mathematics teaching theory and practice as shown in the research literature. Emphasis is on inquiry and other student-centered strategies. Issues and techniques in secondary mathematics. *Preq:* EDSEC 426 or equivalent, master's degree, or consent of instructor.

EDSEC 843 Advanced Studies in the Teaching of Secondary School Science 3(3,1) Methods of science teaching theory and practice as shown by current research literature. Emphasis is on laboratory, inquiry, and other student-centered teaching strategies. Techniques in science curriculum development. Issues in science teaching. Science teaching leadership skills. *Preq:* EDSEC 427 or equivalent, master's degree, or consent of instructor.

EDSEC 844 Advanced Studies in the Teaching of Secondary School Social Studies 3(3,1) Social studies teaching strategies derived from major theories of learning and contemporary research; curricular issues in social studies education. *Preq:* EDSEC 428 or equivalent, master's degree, or consent of instructor.

EDSEC 846 Current Literature in English Education 3(3,1) Research literature in English education; examination of literature in research methods and curriculum in English teaching. *Preq:* A methods course in English education.

EDSEC 847 Current Literature in Mathematics Teaching 3(3,1) Examination of literature in both the research and curriculum in mathematics education. *Preq:* A graduate teaching methods course or consent of instructor.

EDSEC 848 Current Literature in Science Teaching 3(3,1) Recent literature of science education; examination of literature in both the research and curriculum in secondary science teaching. *Preq:* A graduate teaching methods course or consent of instructor.

EDSEC 849 Current Literature in Social Studies Teaching 3(3,1) Examines recent literature in social studies education, in both curriculum and instruction. *Preq:* A graduate teaching methods course or consent of instructor.

SOCIOLOGY

SOC (R S) 601 Human Ecology 3(3,0) See R S 601.

SOC 604 Sociological Theory 3(3,0) Survey of the development of sociological theory. Required of all sociology majors. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 614 Policy and Social Change 3(3,0) Uses the sociological perspective to examine policy development, implementation, and evaluation in the public and private sectors. Specifically, focuses on values and ethics and the effects of social change efforts on the outcomes of policy formation, social planning and implementation. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 633 Globalization and Social Change 3(3,0) Examination of the social and historical causes of development and underdevelopment in societies. Various sociological theories of development are reviewed. Selected countries are examined in an international context. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 635 Leadership and Team Building 3(2,3) Introduction to leadership and the process of building effective teams. Examines various sociological perspectives on leadership and their role in developing and maintaining various types of groups. Students are actively involved in the educational process through experiential learning opportunities. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC (R S) 659 The Community 3(3,0) See R S 659.

SOC 660 Race, Ethnicity, and Class 3(3,0) Investigation of sociological perspectives on race, ethnic relations, and social stratification. Analysis of the impact of social class on minority movements. Not open to students who have taken SOC 431. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 663 Sociology of Parenting 3(3,0) Sociology of parenting, child rearing, parenting styles, and outcomes; social change and parenting; variations by sex, race, and class; cross-cultural comparisons; research-based with applied orientation. *Preq:* SOC 201, Junior standing.

SOC (R S) 671 Demography 3(3,0) Demographic concepts, theory, and research methods for vital statistics, migration, and population distribution and projections. Collection and processing of demographic data and organization of demographic data systems. Offered fall semester only. *Preq:* ANTH 201 or R S 301 or SOC 201.

SOC 680 Medical Sociology 3(3,0) Sociocultural factors in the etiology and treatment of physical illness; medical occupations and professions; organization of health-care delivery systems. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 681 Aging and Death 3(3,0) Sociological orientation to aging populations focusing on the impact of health care, welfare, and retirement systems. Includes dying as a social phenomenon, suicide, euthanasia, funerals. Not open to students who have taken SOC 383. *Preq:* SOC 201 and Junior standing or consent of instructor.

SOC 684 Child Abuse and Treatment 3(3,0) Comprehensive examination of child abuse, neglect, and exploitation as major social problems; causes, effects, and prevalence of physical, sexual, and emotional maltreatment; definitional controversies; social policy and legal considerations; therapeutic approaches for children and their caretakers; child maltreatment and the judicial system. *Preq:* SOC 201 and Senior standing or consent of instructor.

SOC 693 Sociology of Corrections 3(3,0) Analysis of correctional alternatives. Topics include sentencing strategies and their impact, prison populations (male, female, and juvenile), inmate social structures, treatment and custody issues, community based alternatives (probation, parole, electronic monitoring, and work release), and correctional management issues. *Preq:* SOC 390 or consent of instructor.

SOC 694 Sociology of Organized Crimes 3(3,0) Examines the multifarious aspects of criminal organizations, namely their structure, methods, and networks. Specific topics may include white-collar crime and traditional, nontraditional, and transnational organized crime. *Preq:* SOC 201 or consent of instructor.

SOC 803 Survey Designs for Applied Social Research 4(3,2) Survey research design principles, procedures, and techniques used in applied sociology; instrumentation; data collection, management, and interpretation. Offered fall semester only. *Preq:* SOC (R S) 303 or equivalent.

SOC 805 Evaluation Research 3(3,0) Research methods and techniques of computer-assisted data management and analyses used in evaluating policies, operation, organization, and effectiveness of social programs in the private and public sectors; microcomputer software packages available for these purposes. Offered spring semester only. *Preq:* SOC 803.

SOC 807 Advanced Research Methods 3(3,0) Advanced methods in social research; measuring techniques and data analysis strategies; practical experience in various phases of social research. Offered spring semester only. *Preq:* SOC 803.

SOC 810 Theoretical Models in Applied Social Research 3(3,0) Comparative analysis of theoretical models in sociology and their uses in applied research; uses of these models in research concerned with the processes of industrial and economic growth and development. *Preq:* SOC 404 or equivalent.

SOC 830 Human Systems Development: Organizations and Society 3(3,0) Complex organizations such as human systems with primary focus on development and change, interorganizational relations and the influence of these structures on the community life. Offered fall semester only. *Preq:* SOC 430 or equivalent.

SOC 836 Environmental Sociology 3(2,3) Introduction to environmental sociology; relationship among human behavior, society, and the environment; focuses on the natural rather than the built environment; U.S. and global issues.

SOC 891 Master's Thesis Research 1-12

SOC 892 Selected Topics in Sociology 3(3,0) Current topics in applied sociology not covered in other graduate courses. May be repeated once for credit.

SOC 895 Field Experience 3-6 Supervised full-time work experience in a public agency or private enterprise to gain planning, research, and policy experience. May not be repeated for credit. To be taken Pass/Fail only. Offered summer session only. *Preq:* 12 hours of 800-level coursework in sociology.

SOC 896 Independent Study 1-3(1-3,0) Individual readings or research in a topic area selected according to a student's interests or program needs. May be repeated for a maximum of six credits. *Preq:* Approval of director of graduate studies.

SOC 897 Departmental Research and Professional Development Seminar 1(1,0) Presentation of current research by Department of Sociology faculty, staff, graduate students, and visiting researchers. Professional development seminars related to the research process, internships, and employment opportunities. May be repeated for a maximum of four credits. To be taken Pass/Fail only.

SOILS AND SUSTAINABLE CROP SYSTEMS

SSCS 645 Regulatory Issues and Policies 1(1,0) Introduction to regulations of agricultural practices and implementation of novel technologies and products. Emphasizes patenting biotechnology inventions and ethical issues. Includes survey of state and governmental agencies with responsibilities to avoid risk to humans, non-target organisms, and preservation of food safety, agricultural resources, and natural ecosystems.

SSCS 650 Agricultural Biosystems and Risk Assessment 1(1,0) In-depth discussion of recent articles on agricultural biotechnology and related issues. Independent and comprehensive literature survey and critical discussions on introduction of modified organisms into biological systems, agricultural adoption, and bio-risk assessment. Discussions relate to scientific discovery, application, and regulatory issues of agricultural biotechnology.

SSCS 651 Agricultural Biotechnology and Global Society 1(1,0) In-depth discussion of recent articles on agricultural biotechnology and related global issues. Includes independent and comprehensive literature survey and critical discussions on implementation of biotechnology products in the context of world agricultural production systems and economics. Discusses the role of international agencies and social and ethical issues.

SPANISH

SPAN 151 Spanish for Graduate Students 3(3,0) Intensive program only for graduate students preparing for the reading examination in Spanish. A minimum grade of *B* on final exam will satisfy Graduate School foreign language requirement. To be taken Pass/Fail only. May be repeated once. *Preq:* Graduate standing.

SPAN 699 Special Topics 3(3,0) Study of timely or special topics in Spanish. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of department chair.

SPECIAL EDUCATION

ED SP 669 Characteristics of Individuals with Emotional and Behavioral Disorders 3(3,0) Addresses the characteristics of individuals with emotional and behavioral disorders. Consideration is given to historical and legal aspects, definitions, comprehensive assessment, and the impact of school, home, culture, and society on individuals with behavior disorders. Research findings in the field of behavior disorders are emphasized. *Preq:* ED SP 370.

ED SP 670 Characteristics of Individuals with Learning Disabilities 3(3,0) Provides specific knowledge of definitions, evaluation procedures, cognitive, social, academic, and functional skills of individuals with learning disabilities across the lifespan. *Preq:* ED SP 370.

ED SP 672 Characteristics of Individuals with Mental Retardation 3(3,0) Characteristics of mental retardation across the lifespan; learning, behavioral, and developmental aspects are examined. *Preq:* ED SP 370.

ED SP 673 Educational Procedures for Individuals with Mental Retardation 3(3,0) Identification, selection, and preparation of functional curriculum materials and pedagogy for teaching students with mental retardation. A multidisciplinary, student-centered approach to program planning provides the framework. *Preq:* ED SP 472.

ED SP 674 Procedures for Individuals with Emotional and Behavioral Disorders 3(3,0) Assists students in developing specific strategies for teaching individuals with emotional and behavioral disorders, utilizing preventive measures, expanding skills in behavior analysis, and implementing the least restrictive intervention warranted. Includes programmatic considerations, social skill instruction, curriculum selection, IEP development, and effective transition. *Preq:* ED SP 469.

ED SP 675 Educational Procedures for Individuals with Learning Disabilities 3(3,0) Provides knowledge of educational evaluation and instructional procedures to improve outcomes for individuals with learning disabilities. *Preq:* ED SP 470 or consent of instructor.

ED SP 676 Practicum in Learning Disabilities 3(2,3) Addresses content knowledge, skills, and professional values for successful teaching of students with learning disabilities. Focuses on teacher-directed instruction and the use of critical instructional factors, the use of recommended practices for individuals with learning disabilities, and the measurement and analysis of student performance data. *Preq:* ED SP 470, 475; completion of student teaching.

ED SP 678 Practicum in Emotional and Behavioral Disorders 3(2,3) Addresses content knowledge, performance skills, and professional values for successful teaching of students with emotional and behavioral disorders. Focuses on teacher-directed instruction and the use of critical instructional factors, the use of recommended practice for students with disabilities, and the measurement and analysis of student performance data. *Preq:* ED SP 474; completion of student teaching.

ED SP 679 Practicum in Mental Retardation 3(2,3) Addresses content knowledge, performance skills, and professional values for successful teaching of students with mental retardation. Focuses on teacher-directed instruction and the use of critical instructional factors, the use of recommended practices for students with disabilities, and the measurement and analysis of student performance data. *Preq:* ED SP 473; completion of student teaching.

ED SP 738 Selected Topics in Special Education 1-3(1-3,0) Specific master's-level special education topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered.

ED SP 739 Independent Study in Special Education 1-3(1-3,0) Master's-level study of selected topics in special education under the direction of a faculty member chosen by the student; development of a course of study different from any existing courses and designed for the individual student. May be repeated for a maximum of six credits, but only if different topics are covered.

ED SP 760 Social Development and Guidance of Young Children in Inclusive Settings 3(3,0) Focuses on the social development and guidance of very young children—infants, toddlers, and preschoolers—in inclusive early childhood settings. Explores best practices for teachers of infants, toddlers, preschool, and primary age children in diverse education and care settings.

ED SP 820 Language Arts Instruction for Individuals with Disabilities 3(3,1) Research-based methods for instructing individuals with disabilities. Includes principles of effective language arts instruction in reading, writing, speaking, and listening skills. *Preq:* A course in reading methods or consent of instructor.

ED SP 821 Educational Assessment of Individuals with Disabilities 3(3,1) Introduction to the assessment process in special education by addressing procedural safeguards; data collection via informal and standardized procedures; issues in assessment; psychometric properties of standardized tests; and administration, scoring, and interpretation of selected instruments. *Preq:* ED SP 370 or consent of instructor.

ED SP 822 Teaching Mathematics to Individuals with Disabilities 3(3,1) Procedures for teaching mathematics to individuals with disabilities using direct instruction as an approach to assessment, instructional planning, and evaluation. Research in mathematics instruction for individuals with disabilities and mathematics program. *Preq:* ED SP 370 or consent of instructor.

ED SP 823 Teaching Individuals with Disabilities in Integrated Settings 3(3,1) Strategies for teaching individuals with disabilities in integrated settings; appropriate instruction, accommodations, natural supports, collaboration, and consultation. *Preq:* ED SP 370 or consent of instructor.

ED SP 840 Transition Education and Services for Individuals with Disabilities 3(3,1) Postsecondary options for individuals with disabilities; educational programs and services which support their transition from school to life. *Preq:* ED SP 370 or consent of instructor.

ED SP 841 Instructional Strategies for Individuals with Disabilities in Secondary School Settings 3(3,1) Instructional procedures for teaching individuals with disabilities in middle and high schools. Research-validated practices in learning strategies, content-area instruction, functional skills, and community-based instruction. *Preq:* ED SP 370 or consent of instructor.

ED SP 853 Legal and Policy Issues in Special Education 3(3,1) The impact of legislation-IDEA, Section 504 and litigation on special education; six major principles of special education law; interpretation of court cases; residential placements; discipline; extended school year services; compensatory education; inclusion; strategies to minimize litigation and trends in special education. *Preq:* ED SP 370 or consent of instructor.

ED SP 854 Applied Behavior Analysis 3(3,1) Class members accurately recognize, observe, record, and chart inappropriate behaviors; develop behavioral plans based on functional assessment data; determine behavioral objectives; apply behavior analysis principles; and foster student self-management skills. *Preq:* ED SP 370.

ED SP (ED, ED F) 894 Directed Research 1-4(1-4,0) See ED 894.

ED SP 930 Advanced Studies in Special Education 3(3,1) Examines historical, psychological, and sociological foundations of special education emphasizing current state and federal legislation. Includes investigation of case law and policy that impact special education. *Preq:* ED L 725, ED SP 853, or consent of instructor.

ED SP 931 Advanced Research in Learning Disabilities 3(3,1) Investigates history, theory, research, and practice pertaining to selected issues in methods and curriculum within the field of learning disabilities. Employs research-based interventions in the preparation, selection, and adaptation of instruction for students with learning disabilities. *Prq:* ED F 778 and ED SP 821 or consent of instructor.

ED SP 932 Advanced Research in Emotional/Behavioral Disorders 3(3,1) History, theory, research, and practice pertaining to selected issues in the fields of emotional/behavioral disorders. Influence of various theoretical approaches in the field. Research-based interventions and curriculum development. *Prq:* ED SP 821.

ED SP 933 Advanced Research in Mental Retardation 3(3,0) History, theory, research, and practice pertaining to selected issues in the field of mental retardation; historical treatment; theoretical approaches; research-based interventions; community-based and lifespan curriculum development for individuals with mental retardation. *Prq:* Graduate standing, ED SP 821.

ED SP 934 Program Models, Evaluation, and Current Trends in Special Education 3(3,1) Program models, program evaluation, current trends, and issues in programming that impact the growth of special education. *Prq:* ED SP 930.

ED SP (ED, ED F) 980 Internship in Curriculum and Instruction 1-6(0,3-18) See ED 980.

ED SP (ED, ED F) 991 Doctoral Dissertation Research 1-18 See ED 991.

TEXTILES

TEXT 616 Nonwoven Structures 3(2,2) Nonwoven fabric structures, their manufacture, properties, and applications. Methods of nonwoven fabric formation, resultant material characteristics and end-use applications are examined. *Prq:* TEXT 201.

TEXT 622 Properties of Textile Structures 3(2,2) Yarn and fabric properties, their scientific significance and analysis. Dimensional, structural, and mechanical interrelationships are established and evaluated.

TEXT 626 Instrumentation 3(3,0) Principles of industrial and process instrumentation and control as applied in the textile industry; static and dynamic characteristics of measurement devices; transducer principles and techniques of their application for measurement of physical properties such as pressure, temperature, flow, weight, etc.; principles of process controllers; applications of computers in textile process control.

TEXT 645 Special Topics in Textile, Fiber, and Polymer Science 1-3(1-3,0) Special topics in textile, fiber, and polymer sciences. A coenrollment course for similar courses in other departments, such as for those students involved in CAEFF projects and CH E 445. There may be different sections in a term to cover different topics. May be repeated for a maximum of nine credits, but only if different topics are covered. *Prq:* Consent of instructor.

TEXT 660 Textile Processes 3(3,0) Survey of machinery and processes of textile manufacturing from fiber formation through fabric finishing. For students with a nontextile background.

TEXT 672 Textile International Trade 3(3,0) Analyzes the current structure of the international textile trade including imports, exports, tariffs, and trade requirements. Field experience with local firms is used to enhance students' understanding. *Prq:* Senior standing or consent of instructor.

TEXT 675 Textile Marketing 3(3,0) Examination of the activities involved in the distribution of textile products in today's market. Emphasis is placed on the role of consumer research and the analysis of fashion in the design and promotion of textile products.

TEXT 821 Fiber Physics I 3(3,0) Fiber physical properties and their relationship to fiber structure; methods of investigating fiber structure and physical properties; theories of viscoelastic behavior and thermal properties; models of fiber structure. Offered fall semester only.

TEXT 822 Fiber Physics II 3(3,0) Extension of TEXT 821, providing a more in-depth study of the mathematics of polymer fiber viscoelasticity and the solid state thermodynamics of polymeric systems; properties of copolymers; polymer optical and electrical properties; radiation physics of polymers. Offered spring semester only. *Prq:* MTHSC 208 and TEXT 821 or consent of instructor.

TEXT 830 Textile Physics 3(3,0) Physical principles underlying manufacturing environments in which fibers, yarns, and fabrics are produced. Physical and mathematical techniques are developed for the study and analysis of the textile plant environment, controls, and energy requirements. Offered fall semester only.

TEXT 835 Textile Structures I 3(3,0) Pioneering works relating fiber properties to yarn properties; yarn geometry, fiber arrangements in twisted yarns, extension and breakage of continuous filament yarns, and deformation of staple fiber yarns.

TEXT 866 Fiber Formation 3(3,0) Formation of fibers by wet, dry, and melt spinning are studied in depth with emphasis on rheology of solutions and melts, fiber structure, stretching and drawing processes, and the interrelationships of polymer properties and processes that determine fiber properties. Offered spring semester only.

TEXT 880 Selected Topics 3(3,0) Topics not covered in other textile chemistry or textile science courses.

TEXT 891 Master's Thesis Research 1-12

TEXT 991 Doctoral Dissertation Research 1-12

THEATRE

THEA (ENGL) 630 Dramatic Literature II 3(3,0) See ENGL 630.

THEA (ENGL) 647 Playwriting Workshop 3(0,3) Workshop in the creative writing of plays. May be repeated once. *Prq:* THEA (ENGL) 347 or consent of instructor.

THEA 672 Improvisation: Interpreting and Developing Texts 3(3,0) Practical applications using drama as a learning tool to strengthen writing skills, motivate collaboration, and heighten analytical skills. Students use improvisation to analyze texts and to revise original work, consider theory and research of contemporary scholars, and develop approaches to literature and composition based on readings and drama experiences. *Prq:* Senior standing or consent of instructor.

THEA 687 Stage Lighting I 3(2,1) Theory and practice of stage lighting through an understanding of various lighting instruments, lighting control systems, and execution of lighting designs.

THEA 697 Scene Painting 3(2,1) Practical study of basic painting techniques for the theatre including layout, proper use of materials, painting styles, and texturing techniques.

THEA 699 Independent Studies 1-3(1-3,0) Tutorial work for students with special interests outside the scope of existing courses. May be repeated for a maximum of six credits. *Prq:* Consent of department chair.

VOCATIONAL/TECHNICAL EDUCATION

VT ED 810 Foundations of Vocational and Technical Education 3(3,0) Evolution of vocational and technical education during the 20th century and current trends; sociological, psychological, and philosophical theories underlying current objectives; definition of broad parameters of the field.

VT ED 812 Vocational and Technical Program Finance 3(3,0) National, state, and local legislation governing financial support of vocational/technical programs; development of budget, audit, and financial administrative plans and systems. *Prq:* VT ED 810 and ED L 745 or equivalent.

VT ED 833 Curriculum Construction in Vocational and Technical Education 3(3,0) Students develop a specific course in a selected vocational and technical education area by specifying performance goals and building around these objectives. *Prq:* AG ED 640 or CTE 670 or equivalent.

VT ED 850 Programs, Concepts, and Issues in Vocational and Technical Education 3(3,0) Current activities and debates in vocational and technical education; traditional and innovative programs, career education, school finance, disadvantaged students, handicapped youth, sex equality, and other specialized programs.

VT ED 861 Administration and Supervision in Vocational and Technical Education 3(3,0) Principles and practices for administering and supervising vocational and technical schools and classes under federal vocational acts, state regulations, and local policies. *Prq:* VT ED 810 or consent of instructor.

VT ED 876 College Teaching 3(3,0) Instructional practices; curriculum; techniques of organizing and planning learning experiences; analysis of teaching strategies and systems.

VT ED 882 Seminar 1(1,0) Current issues and problems and proposed research projects.

VT ED 893 Advanced Research Design and Analysis 3(3,0) Emphasis on the dissertation from the proposal to the fully developed outline of all chapters. Required of all doctoral candidates in the vocational/technical education program. *Preq:* AG ED (CTE, ED) 889 or equivalent.

VT ED (ED L) 955 The Two-Year College 3(3,0) See ED L 955.

VT ED 980 Internship in Vocational/Technical Education 1-6 (0,3-18) Internship in which students gain experience working in a chosen area of specialization in vocational/technical education; field experience activities must be planned to build competence in the student's field of specialization. To be taken Pass/Fail only. *Preq:* Consent of the major advisor.

VT ED 991 Doctoral Dissertation Research 1-12

WILDLIFE AND FISHERIES BIOLOGY

W F B 610 Wildlife Management Techniques 3(1,6) Covers field and laboratory methods commonly used in wildlife management and research. Students interact with wildlife professionals. Topics include research methodology, estimating wildlife population characteristics, condition measures, and food habits; species determinations, sex and age, capture; population monitoring methods, GIS and mapping techniques, habitat evaluation and improvement. *Preq:* Junior standing; one year of general biology.

W F B 612 Wildlife Management 3(2,3) Basic principles and general practices of wildlife management and conservation are covered. Major problems concerning the management of wildlife resources, with emphasis on upland game species. Laboratory work includes practical work on the Clemson University woodlands and field trips to areas where wildlife management is being practiced.

W F B 614 Wildlife Nutritional Ecology 3(3,0) Concepts of how terrestrial wildlife obtains and utilizes energy and nutrients in wild ecosystems are taught. Energy and nutrient availability are discussed in the ecological context of distribution, flow, and cycling in natural and modified foraging areas. Physiology of digestion for major homeotherms. Offered spring semester only. *Preq:* FOR 415 or W F B 412.

W F B 616 Fishery Biology 3(2,3) Principles underlying freshwater fish production, major groups of freshwater fishes and their habitats. Topics include identification, age and growth, fecundity, food habits, populations estimation, environmental evaluation, management practices, and fish culture. *Preq:* One year of introductory biology, Junior standing.

W F B 630 Wildlife Conservation Policy 3(3,0) Deals with the ecological rationale and management implications of public policy designed for the conservation of American wildlife resources. Emphasis is on managed-land issues. *Preq:* W F B 350 or consent of the instructor.

W F B 644 Wildlife Damage Management 3(2,3) Covers the philosophical, sociological, ecological, and economic basis for controlling damage caused by animals problem wildlife populations. Emphasis is on fundamentals of prevention and control of damage caused by vertebrate species, especially mammals and birds. Includes interaction with federal and state agencies and private consultants. *Preq:* One year of introductory biology.

W F B 650 Aquaculture 3(3,0) Basic aquacultural techniques applied to freshwater and marine organisms; past and present culture of finfishes and shellfishes around the world; principles underlying fish production; water quality, feeding and nutrition as they influence production of cultured aquatic organisms. *Preq:* One year of general biology, Junior standing.

W F B 660 Warmwater Fish Diseases 2(2,0) Study of diseases in warmwater fish including infectious and noninfectious processes. *Preq:* One year of general biology, Junior standing, consent of instructor.

W F B 662 Wetland Wildlife Biology 3(3,0) Study of wetland wildlife habitats, emphasizing classification by physical, chemical, and biological characteristics; importance of wetland habitat for management and production of wetland wildlife species. Offered fall semester only. *Preq:* BIOL 104/106 or 111.

W F B (BIOSC, ENT) 669 Aquatic Insects 3(1,6) See ENT 669.

W F B 712 Wildlife Conservation for Teachers 2-3(2-3,0) Principles and practices of wildlife conservation providing an overview of wildlife diversity, ecology, and management in the state; population census, wildlife identification, capture and habitat management of game and nongame species. For in-service teachers only. *Preq:* Consent of instructor.

W F B 809 Seminar in Wildlife and Fisheries Science 1(1,0) Current literature and research in fisheries and wildlife sciences. At least one presentation is required. May be repeated for a maximum of four credits.

W F B 810 Publishing in Natural Resource Journals 2(2,0) Principles of preparing research manuscripts for publication in natural resource journals including searching the literature, communicating with editors, responding to reviews, publication ethics, and performing peer reviews. Offered spring semester of odd-numbered years only.

W F B 815 Principles of Wildlife Biology 3(2,3) Theories and principles applicable to wildlife biology emphasizing upland game species. Offered fall semester of even-numbered years only.

W F B 818 Waterfowl Ecology and Management 3(2,3) Identification, ecology, and management of waterfowl. Laboratory work includes demonstration and application of relevant waterfowl management techniques, current literature topics, and field trips. Offered fall semester of odd-numbered years only. *Preq:* BIOSC 441 or W F B 412 or consent of instructor.

W F B 840 Fish Management 3(2,3) Principles and techniques of managing aquatic systems for recreational and/or commercial fishing, emphasizing streams, rivers, estuaries, and impoundments. Laboratory work includes demonstration and application of management techniques and field trips to observe management practices. Offered fall semester of odd-numbered years only. *Preq:* W F B 416 or consent of instructor.

W F B 860 Diagnostic Procedures of Warmwater Fish Diseases 2(1,2) Warmwater fish disease diagnostic procedures employing proper protocol to be followed by a fish disease diagnostician. Offered summer session of odd-numbered years only. *Coreq:* W F B 460 or consent of instructor.

W F B 861 Selected Topics 1-4(0-4,0-12) Current areas of aquaculture, fisheries, and wildlife management and research. May be repeated for credit. *Preq:* Consent of instructor.

W F B 863 Special Problems in Wildlife and Fisheries Biology 1-3(0,3-9) Research not related to a thesis. Credit varies with problems selected. *Preq:* Consent of instructor.

W F B 891 Master's Thesis Research 1-12

W F B 991 Doctoral Dissertaton Research 1-18

WOMEN'S STUDIES

W S 659 Selected Topics in Women's Studies 1-3(1-3,0) Topics change from semester to semester and are announced prior to registration. May be repeated for a maximum of six credits, but only if different topics are covered.