PA 621 QUANTITATIVE METHODS OF RESEARCH. (3)
A survey of behavioral science research methods for the public administrator. Emphasis is placed upon problem selection and identification, research design, and data analytic techniques. Prereq: MPA or MHA program status; prereq or concur: completion of MPA or MHA computer skills program requirement. (Same as HA 621.)

PA 622 PUBLIC PROGRAM EVALUATION. (3)
This course is designed to provide students with the conceptual and analytical tools to evaluate the effectiveness of public programs and policies. The focus will be on program monitoring and evaluation. Of particular concern will be program process and outcome measurement; quasi-experimental design; multiple regression analysis; and analysis of variance models. Prereq: PA 621.

PA 623 DECISION ANALYSIS. (3)
An introduction to organizational decision making under conditions of uncertainty, risk, and certainty. Concepts of analysis from the areas of economics, mathematics, and statistics will be utilized in terms of administrative decision making in public administration. Prereq: PA 621. (Same as HA 623.)

PA 625 PUBLIC MANAGEMENT COMPUTER APPLICATIONS.

PA 628 PERSONNEL MANAGEMENT IN THE PUBLIC SECTOR. (3)
The course will present an overview of career development, human resource planning, staffing, training and development in the public sector. Prereq: MPA program status; consent of instructor.

PA 631 PUBLIC FINANCIAL MANAGEMENT. (3)
An analysis of budget structure and process; revenue structure and administration; and public capital acquisition and debt management. This course emphasizes an applied focus and comparative analysis of alternative budget, revenue, and debt management structures and strategies. Prereq: MPA program status; prereq or concur: completion of MPA or MHA computer skills program requirement.

PA 632 PUBLIC FUNDS MANAGEMENT. (3)
A study of the management of public funds including the accumulation, management and investment of such funds and the accounting for those transactions. It will also include topics such as fund accounting, cash forecasting, cash management practices and public funds investment strategies. Prereq: MPA or MHA program status; prereq or concur: completion of MPA or MHA computer skills program requirement. (Same as HA 632.)

PA 636 HEALTH ECONOMICS. (3)
This course applies general theoretical principles of economics to the health care sector. The basic approach is to recognize the importance of scarcity and incentives, allowing for differences peculiar to health. The demand and supply of health and medical care are examined as they involve physicians, nurses and hospitals. The competitiveness of their markets, health insurance and the role of government are explored. Special topics include regulation and planning, benefit-cost analysis, and reform health plans. Prereq: PA 652, HA 601, HA 621, MHA or MPA program status. (Same as ECO/HA/HSM 636.)

PA 637 HEALTH FINANCE. (3)
This course applies general principles of finance to the financial management of health care institutions. The major financial incentives which dictate how health care is delivered are studied and proposals to change these incentives are explored. Prereq: MHA/MPA program status and HA 601, HA 621, PA 623, HA 635. (Same as FIN/HA/HSM 637.)

PA 639 MANAGEMENT CONTROL SYSTEMS IN NON-PROFIT ORGANIZATIONS.

PA 641 POLITICAL ENVIRONMENT OF PUBLIC ORGANIZATIONS. (3)
A study of those aspects of political and legal systems that particularly affect the administration of public agencies. Emphasis on party systems, legislative and executive processes, administrative law, and judicial review of administration. Prereq: MPA program status.

PA 642 PUBLIC ORGANIZATION THEORY AND BEHAVIOR. (3)
A course which examines the interaction of both external and internal resources and constraints upon the administrative decision processes in a number of public organizational settings. The objective is an understanding of the practice of administration in public organizations. Prereq: MPA or MHA program status and HA 601. (Same as HA 642.)

PA 651 THE POLICY PROCESS. (3)
Broad-based course in public policy formulation and social planning. Emphasis is on the parameters of policy formulation as well as the social planning and impact variables. Both policy processes and relevant content areas will be stressed. Prereq: MPA program status.

PA 652 PUBLIC POLICY ECONOMICS. (3)
Principles and practices of economical resource management in the governmental sector: tax and expenditure types, intergovernmental fiscal cooperation, debt financing, budgeting and financial planning. Prereq: MPA or MHA program status and HA 601 and HA 621. (Same as ECO/HA 652.)

PA 653 LOCAL ECONOMIC DEVELOPMENT. (3)
The course develops the capacity to employ the theories, practices and philosophies of economic development as applied to local areas. The primary geographic focus of the course is the rural south-east of the United States, but examples will be drawn from rural areas in other developed countries. Prereq: Graduate status in agricultural economics, public administration, economics, or consent of instructor. (Same as AEC 653.)

PA 656 HEALTH PROGRAM EVALUATION. (3)
A study of the tools necessary for planning and evaluating health programs: planning systems, needs assessment methodologies, data analysis skills, the epidemiologic method, effectiveness and efficiency evaluation. An overview of trends and requirements leading to increased emphasis on planning and program accountability. Prereq: MHA/ MPA program status, HA 601, HA 621, PA 623, and HA 635. (Same as HA 656.)

PA 671 OVERVIEW OF THE HEALTH CARE DELIVERY SYSTEM. (3)
An introduction to the health care delivery system in the United States, including its composition, functioning, the interrelationships of organizations and professional groups within the system in various settings, health care terminology, and major problems and issues in the delivery of health services. Prereq: MHA/MPA program status. (Same as HA/HSM 601.)

PA 673 HEALTH POLICY DEVELOPMENT. (3)
An analysis of the development and implementation of health policy on a national, state, local and organizational level. The course will focus on issue and policy analysis, formal and informal processes of policy development and the issues, values and political and community factors affecting policy development and program implementation. Prereq: HA 601 and one of the following courses: HA 611, 621, or 622 and MHA/MPA program status. (Same as HA 673.)

PA 680 BENEFIT-COST ANALYSIS. (3)
Principles, practices and applications of applied welfare analysis are the content of this course. The basic theory of benefit-cost analysis is presented and the relevance of implementation analysis in policy analysis is established. Prereq: PA 652. (Same as ECO 680.)

PA 711 INTERNSHIP IN PUBLIC ADMINISTRATION. (3)
Practical field experience in an administrative setting under the direction of an academic and a workplace supervisor. Prereq: MPA program status or consent of instructor.

PA 722 POLICY AND PROGRAM EVALUATION. (3)
This is a doctoral course concerning policy and program evaluation. Major emphasis will be given to specifying the relationship between evaluation and management functions, evaluation concepts and processes and research methods applicable to evaluation systems and processes. Prereq: MKT 762 or PS 671, or equivalent and Ph.D. program status or consent of instructor.

PA 727 ENVIRONMENTAL ECONOMICS, REGULATION AND POLICY. (3)
This course takes a balanced practitioner approach to the problems of the environment and environmental regulation. Efficiency aspects will be developed carefully, so as to provide a background for an extensive coverage of various available alternative policies. Prereq: PA 652 and MPA or economics program status or consent of instructor. (Same as ECO 684.)

PA 731 FISCAL AND BUDGETARY POLICY. (3)
This course examines public budgeting and finance in the public sector. Included is an analysis of economic, managerial, and political approaches to public budgeting and finance. These approaches are then used to analyze several current topics in public finance. Prereq: PA 631 or equivalent, and Ph.D. program status or consent of instructor.

PA 742 THEORY OF PUBLIC ORGANIZATIONS. (3)
This course provides doctoral students an in-depth knowledge of the various aspects of public organization theory. It will attempt to integrate the work on public organizations which is currently spread over the fields of organization theory and behavior, executive and bureaucratic politics and public choice economics. Prereq: PA 642 or equivalent, and Ph.D. program status or consent of instructor.
PA 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying examinations.

PA 751 PUBLIC POLICY FORMULATION AND IMPLEMENTATION. (3)
The major goals of this course are to examine how public issues become policy proposals, how various proposals are filtered into (or out of) the political process, shaped by political institutions and rules, and the process by which policy is implemented. Prereq: PA 651, or equivalent and Ph.D. program status or consent of instructor.

PA 752 THE ECONOMICS OF POLICY ANALYSIS. (3)
This course examines economic approaches to policy analysis. Included is an analysis of the major concepts of economic analysis and their application to a number of policy problems. Prereq: PA 652 or equivalent, and Ph.D. program status or consent of instructor. (Same as ECO 752.)

PA 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

PA 775 SPECIAL TOPICS IN HEALTH ADMINISTRATION. (1-3)
An analysis of selected issues with special significance for health administration. Prereq: MPA/MHA program status. (Same as HA/HSM 775.)

PA 785 INDEPENDENT STUDY IN HEALTH ADMINISTRATION. (1-3)
Supervised individual research on a topic related to health administration selected by the student. May be repeated to a maximum of six credits. Prereq: Consent of instructor. (Same as HA/HSM 785.)

PA 795 SPECIAL TOPICS IN PUBLIC ADMINISTRATION. (1-3)
Analysis of specialized topics in public administration of particular interest to practitioners. May be repeated to a maximum of six credits. Prereq: MPA program status or consent of instructor.

PA 796 INDEPENDENT STUDY IN PUBLIC ADMINISTRATION. (1-3)
Tutorial course of directed readings, discussion, and analysis of special topics on public administration. May be repeated to a maximum of six credits. Prereq: MPA program status and consent of instructor.

PAS 824 CLINICAL PRACTICUM IN PHYSICIAN ASSISTANT STUDIES. (1-6)
This field assignment offers supervised clinical experience appropriate to the PA student’s chosen area of practice. May be repeated to a maximum of 12 credits. Studio, 40 hours per week. Prereq: Enrollment in Physician Assistant Program.

PAS 850 CLINICAL METHODS. (3)
This course is designed to provide a general overview of the clinical methods utilized in patient care experiences involving patient evaluation and management skills. Lecture, two hours; laboratory, three hours. Prereq: Enrollment in the Physician Assistant Program.

PAS 851 INTRODUCTION TO THE PA PROFESSION. (2)
This course provides an overview of selected health care delivery issues affecting primary care physician assistants. The first half of the semester is devoted to examination of the history and evolution of the PA profession, current PA practice demographics and regulations, principles of quality assurance, risk management, and medical literature evaluation. The second half of the semester is devoted to the study of the ethical dimensions of PA practice. Topics include moral principles and ethical theories, as well as a series of seminar discussions on contemporary ethical issues confronting primary care providers in the 20th and 21st centuries. Prereq: Enrollment in the Physician Assistant Program.

PAS 853 INTRODUCTION TO HEALTH AND DISEASE. (3)
An overview of the etiology, distribution, and prevention of basic disease processes. Prereq: Enrollment in Physician Assistant Program.

PAS 854 CLINICAL LECTURE SERIES I. (3)
A study of common diseases and disorders seen in primary care medical practice. Emphasis is placed on identifying the etiology, clinical presentation, laboratory, and x-ray abnormalities, management, and prevention of disease/disorders of the cardiovascular, pulmonary, renal, gastrointestinal, hematological, endocrine, and neurological systems. Prereq: Enrollment in the Physician Assistant Studies Program.

PAS 855 PSYCHOSOCIAL FACTORS IN PRIMARY HEALTH CARE. (3)
This course focuses on psychosocial factors which play an important role in the development and treatment of common primary health care problems. Prereq: Admission to Physician Assistant Program.

PAS 856 PATIENT EVALUATION AND MANAGEMENT. (3)
A combination of formal presentations, laboratory practice sessions, and supervised patient care experiences involving patient evaluation and management skills. Lecture, one hour; laboratory, five hours per week. Prereq: Enrollment in Physician Assistant Program or consent of instructor.

PAS 857 CLINICAL LABORATORY PROCEDURES. (3)
This is a laboratory course covering common laboratory procedures performed in the primary care clinical setting. Emphasis will be placed on performing and interpreting basic clinical tests. Lecture, two hours; laboratory, three hours per week. Prereq: Enrollment in the Physician Assistant Studies Program.

PAS 858 CLINICAL LECTURE SERIES II. (3)
A study of common disease and disorders seen in primary care medical practice. Emphasis is placed on identifying the etiology, clinical presentation, laboratory and x-ray abnormalities, management and prevention of diseases/disorders seen in orthopedics, dermatology, emergency medicine, pediatrics, and obstetrics and gynecology. Prereq: Enrollment in the Physician Assistant Studies Program and successful completion of PAS 854.

PAS 860 FAMILY MEDICINE CLERKSHIP. (5)
This is a five-week clinical course designed to provide the student physician assistant experience associated with family medicine. The student will have the opportunity to function in either an office-based or clinical setting supervised by a family physician. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 861 PEDIATRIC CLERKSHIP. (5)
This is a five-week clinical course designed to acquaint the student physician assistant with clinical experience in evaluating pediatric patients. The student will have the opportunity to function within a pediatric practice under medical supervision. Emphasis will be placed on the diagnosis and management of diseases of children. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 862 OBSTETRICS AND GYNECOLOGY CLERKSHIP. (5)
This is a five-week course designed to provide the student physician assistant experiences in the care of the obstetrical patient involving prenatal labor and delivery and post-partum care under medical supervision. Emphasis will be placed on gynecologic problems commonly seen in primary care settings. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 863 SURGERY CLERKSHIP. (5)
This is a five-week clinical course that provides the student physician assistant experiences in the management of patients with surgical problems. Emphasis will be placed on the central principles of surgery. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 867 PRECEPTORSHIP I. (4)
Provides the PA student with the opportunity to integrate his previous year of didactic education and seven months of clinical course work into a functioning system. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.
PAS 868 PRECEPTORSHIP II. (4)
This course provides the student with the opportunity to integrate his previous year of didactic education and seven months of clinical course work into a functioning system. This course is a continuation of Preceptorship I. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 869 INTERNAL MEDICINE CLERKSHIP. (5)
This course provides the student with an experience in evaluating the adult patient with the variety of acute and chronic problems seen in an outpatient setting. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 870 EMERGENCY MEDICINE CLERKSHIP. (5)
This course provides the student with training in triaging, evaluating and managing patients with a wide variety of complaints seen in an emergency room setting. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 871 PSYCHIATRIC CLERKSHIP. (5)
This course provides the student with an experience in evaluating psycho-social problems and mental health in an outpatient setting, and observation of the ongoing management of these problems. An assigned textbook and specified reading assignments will be required. In addition, students will be required to successfully pass practical as well as written examinations on course content. Prereq: Successful completion of the junior year and enrollment in the Physician Assistant Program.

PAS 872 PRACTICAL THERAPEUTICS. (3)
The purpose of this course is to provide the student with an understanding of the practical use of drugs utilized in primary care. Prereq: Enrollment in the Physician Assistant Program.

PAS 880 SEMINAR IN PHYSICIAN ASSISTANT STUDIES. (1-3)
A study of selected topics and contemporary issues regarding the delivery of health care services by physician assistants. May be repeated to a maximum of six credits. Prereq: Enrollment in Physician Assistant Program or consent of instructor.

PAT Pathology

PAT 598 CLINICAL MICROBIOLOGY. (3)
An introduction to the concepts of clinical microbiology through a survey of the microbial diseases of man using an organ system approach. Prereq: BIO 208 and 209, BIO 476G recommended, CHE 230 or 236, or consent of instructor. (Same as MI 598.)

PAT 660 CLINICAL TOXICOLOGY AND DRUG MONITORING. (3)
A lecture and demonstration course designed to acquaint the student with the two main areas of clinical toxicology. The first part of the course will cover the scope of the drug abuse problem in the U.S.A. and detail the emerging role of the clinical toxicologist in dealing with a wide variety of analytical and medicolegal problems associated with illicit drug detection. The second part of the course will cover the rapidly expanding area of clinical toxicology which deals with the monitoring of therapeutic drugs as they relate to the appropriate clinical management of patients. Prereq: BCH 501 and 502, PHA 521 and 522, or equivalent consent of instructor. (Same as TOX 660.)

PAT 665 THE FORENSIC APPLICATION OF DNA TYPING METHODS. (3)
A lecture course that will give the student comprehensive exposure to the methods of molecular biology that enable the detection and analysis of polymorphic regions in DNA. Emphasis is placed on the application of these techniques to the biological fluids and tissues that are often the byproducts of violent crimes.

PAT 823 MECHANISMS OF DISEASE AND TREATMENT/PATHOLOGY. (10)
This is a course in basic mechanisms of disease causation and specific diseases of the organ systems. It introduces fundamental disease processes and the pathophysiology of major diseases affecting each of the organ systems. It stresses how disease alters normal structure and function and is closely integrated with PAT 824. Various teaching methodologies utilized include lectures, small group discussions, workshops, case studies, and computer-assisted instruction. Lecture, 20 hours per week. Prereq: Admission to second year of medical curriculum. (Same as MD 823.)
PER 661 MODERN CONCEPTS IN PERIODONTICS. (2)
A seminar course designed to present the present understanding of the etiology of periodontal disease and current techniques for treatment of periodontal problems. Prereq: Admission to a postdoctoral program of the College of Dentistry or consent of course director.

PER 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PER 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated for a total of 12 hours. Prereq: Admission to the Periodontics postdoctoral program and consent of director of graduate studies.

PER 770 TREATMENT PLANNING SEMINAR. (2)
In this seminar course, graduate students present and discuss diagnosis, prognosis, ideal treatment plans and alternative treatment plans for patients with periodontal disease. Each student gives at least eight case presentations. May be repeated to a maximum of eight credits. Lecture, 40 hours. Prereq: Admission to the Periodontics postdoctoral program or consent of course director.

PER 772 PERIODONTAL BIOLOGY AND PATHOLOGY. (2)
Seminar discussions, review and evaluation of the literature covering periodontal anatomy, periodontal biology, the pathology of periodontal diseases and etiological factors in periodontal disease. The subject area will be covered in four semesters. May be repeated four times for a maximum of eight credits. Lecture, 40 hours. Prereq: Admission to the Periodontics postdoctoral program or consent of course director.

PER 774 PERIODONTICS SURGICAL SEMINAR. (1)
In this seminar course participants present, discuss and critique surgical procedures that have been accomplished in the clinic. Reading assignments from the literature augment the clinical discussions and students are encouraged to use the literature to justify their procedures. Cases are presented on a rotating basis. May be repeated to a maximum of four credits. Prereq: Admission to Periodontics postdoctoral program or consent of course director.

PER 776 PERIODONTAL THERAPY SEMINAR. (1)
This is an advanced series of seminars on the clinical aspects of periodontal therapy. During the course, the students will learn about various modalities of periodontal therapy as presented in the periodontal literature, e.g., mucogingival treatment, implants and curettage. May be repeated to a maximum of two credits. Prereq: Admission to the Periodontics postdoctoral program or consent of course director.

PER 790 RESEARCH IN PERIODONTICS. (1-3)
This course involves direct student participation in a research project. Projects and thesis are approved by the course director and may be clinical, laboratory experimental or related to dental education. Projects may include original or ongoing research within the Department of Periodontics or other departments of the Medical Center. May be repeated to a maximum of six credits. Prereq: Admission to the Periodontics postdoctoral program and consent of the department involved.

PER 820 PERIODONTICS II. (1)
This course presents the components of the first stages of periodontal therapy. Emphasis is on diagnosis, prognosis, treatment planning and treatment of the periodontally involved patient. The student is also introduced to the principles of periodontal surgery. Lecture, 25 hours; laboratory, two hours. Prereq: PER 810 or consent of course director.

PER 821 CLINICAL PERIODONTICS II. (2)
This is a course designed to provide the student with clinical experience so that he can obtain a minimal competence in the applications of periodontal procedures. Therapeutic procedures involving initial periodontal therapy will be performed by each student. Clinic, 50 hours. Prereq: PER 811, or consent of instructor.

PER 830 PERIODONTICS III. (1)
This is a surgically oriented course which presents information necessary for the diagnosis, treatment planning and treatment of surgical cases. The information gained is applied to planning treatment for actual surgical cases. Lecture, 24 hours; laboratory, six hours. Prereq: PER 820 or consent of course director.

PER 831 CLINICAL PERIODONTICS III. (2)
This is a clinical course which offers the student the opportunity to treat patients with more advanced periodontal disease. Therapeutic procedures will be performed by each student as his patients’ needs dictate. Clinic, 50 hours. Prereq: PER 821; corequisite: PER 830; or consent of instructor.

PER 841 CLINICAL PERIODONTICS IV. (4)
This clinical course is a continuation of PER 831. The student receives further instruction and experience in diagnosing, planning treatment and treating patients with periodontitis and mucogingival problems. Prereq: PER 830 and PER 831, or consent of instructor.

PER 850 PERIODONTICS ELECTIVE.
PGY 560 PATHOPHYSIOLOGY: INTEGRATIVE STUDY IN PHYSIOLOGY AND MEDICINE. (1)
This course aims at the development of an integrative conception of the human organism, and involves the study of medical case histories. The complex network of physiologic interactions which underlie disease states is investigated. The physiologic bases of health, illness, dying, and death are explored. May be repeated to a maximum of three credits. Prereq: PGY 412G, PGY 502 or consent of instructor.

PGY 590 CELLULAR AND MOLECULAR PHYSIOLOGY. (4)
This course will focus on the cellular and molecular physiology of inter- and intracellular communication. In particular, it will provide an overview of established and emerging intracellular signaling mechanisms which utilize (i) cyclic nucleotides (cAMP, cGMP), (ii) calcium, (iii) insulin and insulinotrophic metabolism: cyclic AMP/ribose, (iv) transmembrane ion fluxes (voltage- and receptor-operated channels), (v) tyrosine kinases, and (vi) nuclear transcription factors. The material will be presented in a number of formats including didactic lecture and group discussions of selected readings. Prereq: PGY 412G, PGY 502 or consent of instructor. (Same as MI 590.)

PGY 601 MAMMALIAN ENDOCRINOLOGY. (3)
An introduction to the basic anatomy, physiology and biochemistry of endocrine systems with emphasis on mechanisms of hormone synthesis, secretion and action. Lectures and reading assignments will focus on endocrine function in mammalian species, including laboratory animals, humans and livestock. Prereq: BCH 401G and BIO 350 or equivalents. (Same as ASC 601.)

PGY 602 READINGS IN SYSTEMS, CELLULAR AND MOLECULAR PHYSIOLOGY. (3)
A critical evaluation at the advanced level of the literature of the major mammalian physiological systems at the organ, cellular and molecular level. The course is intended to be taken with and to complement PGY 502. It includes a critical reading of the primary literature. Prereq: One year each of physics, general chemistry, PGY 206 or equivalent.

PGY 604 ADVANCED CARDIOVASCULAR PHYSIOLOGY. (3)
The objective of this course is to examine in-depth the various functions of the cardiovascular system and their proposed mechanisms. Prereq: PGY 502 or consent of instructor.

PGY 605 PRINCIPLES OF NEUROBIOLOGY. (4)
The objective of this course is to provide graduate students of diverse backgrounds with an introduction and overview of neurobiology. Areas covered will include neuronal and glial cell biology, neurotransmitters, signaling mechanisms, neuroanatomy, and neuronal development. The course is designed to provide a broad overview of each of the areas and introduce students to current research questions. The course will consist of lectures and informal presentations in a 'Journal Club' format. The course will be interdisciplinary and will be of interest to graduate students in anatomy, biology, biochemistry, immunology, pharmacy, pharmacology, physiology, psychology and toxicology and to neurology and neurosurgery residents. Prereq: Introductory biochemistry course, or equivalent, and/or consent of instructor. (Same as ANA/BCH/NEU/PHA 605.)

PGY 606 ADVANCED NEUROPHYSIOLOGY. (3)
Electrical analysis of nerve fibers and synapse; nerve impulse theories, reflexes, metabolism and central nervous function are considered from the cybernetic viewpoint. Prereq: PGY 502 or consent of instructor.

PGY 607 HORMONAL CONTROL MECHANISMS (Subtitle required). (3)
Advanced study of the hormonal aspects of the physiologic regulation of vertebrate organ systems. One or two specific areas of endocrinology will be selected by the instructor. Emphasis will be placed on critical analysis and discussion of the experimental basis for current theories of the mechanisms whereby hormones modulate physiologic processes. Readings will be taken from the literature. May be repeated to a maximum of six credits. Prereq: PGY 502, PGY 549 or their equivalent.

PGY 608 ADVANCED RENAL PHYSIOLOGY. (3)
This course will examine in-depth the physiology and pathophysiology of the renal system, as well as provide an understanding of advanced renal physiological techniques. Prereq: PGY 412G, PGY 502 or consent of instructor.

PGY 609 ADVANCED RESPIRATORY PHYSIOLOGY. (3)
This course will examine in-depth the physiology and pathophysiology of the respiratory system. Prereq: PGY 412G, PGY 502 or consent of instructor.

PGY 610 EXPERIMENTAL PHYSIOLOGY. (4)
This course will introduce students to the nature of physiological experimentation, and provide an opportunity to gain first-hand experience in conducting experiments which illustrate fundamental physiological concepts. Laboratory, eight hours per week. Prereq: PGY 502 or consent of instructor.

PGY 613 BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course introduces students to major topics in behavioral ecology and comparative neurobiology with an emphasis on inter-relationships between these fields. Topics to be covered vary each semester, but typically include: the optimality approach to understanding behavior, predator-prey behavior, mating and social behavior, behavioral genetics, neural circuits and behavior, sensory biology, neural development, and neural plasticity. Prereq: Permission of the instructor. (Same as ANA/BIO/ENT/PSY 613.)

PGY 614 TECHNIQUES IN BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course provides students with instruction and experience in the experimental research techniques employed in the study of behavioral ecology and comparative neurobiology with emphasis on the integration of these approaches for understanding animal behavior. Each student will carry out three small research projects in the laboratories of three of the participating faculty. Techniques to be covered include: molecular and genetic methods, neuroanatomical and neurophysiological techniques, and field and laboratory methods for quantifying behavior and studying effects of social and environmental influences on behavior. Prereq: Permission of the instructor. (Same as ANA/BIO/ENT/PSY 614.)

PGY 615 SEMINAR IN TEACHING MEDICAL SCIENCE (MED SCIENCE TEACHING I). (1)
A one (1) credit seminar course in which issues related to the theory and practice of life science education will be discussed in a Socratic manner. May be repeated to a maximum of three credits. Prereq: Current enrollment in a life science graduate program.

PGY 616 PRACTICUM IN TEACHING MEDICAL SCIENCE (MED SCIENCE TEACHING II). (2)
A two (2) credit experimental course in which students will directly participate in the teaching of Physiology under supervised conditions. May be repeated to a maximum of six credits. Prereq: PGY 615 may be taken concurrently.

PGY 618 MOLECULAR NEUROBIOLOGY. (4)
This course provides knowledge base and analytical skills in the field of molecular neurobiology. An in-depth introduction to current technologies, their rationale and limitations, will be the focus to address normal brain function and neuropathological conditions. Prereq: BCH 501, 502, NEU 605, or consent of instructor. (Same as ANA/BCH/NEU/PHA 605.)

PGY 627 PROSEMINAR IN PHYSIOLOGICAL PSYCHOLOGY. (3)
An intensive examination of theories, methods of investigation, and current developments in the field of physiological psychology. Prereq: Graduate standing or consent of instructor. (Same as PSY 627.)

PGY 630 ADVANCED TOPICS IN PHYSIOLOGY. (1-3)
Contemporary topics in physiology. Course designed to utilize the special research interests of resident and visiting faculty. May be repeated to a maximum of six credits. Prereq: PGY 502 or consent of instructor.

PGY 638 DEVELOPMENTAL NEUROBIOLOGY. (3)
An explanation of the processes which contribute to the development of the nervous system. Neurophysiological, cell biological and molecular approaches to cell differentiation, neuronal pathfinding and synapse formation and stabilization will be explored and discussed. Examples will be drawn from both vertebrate and invertebrate preparations. Prereq: BIO 535 or consent of instructor. (Same as ANA/BIO/PSY 638.)

PGY 650 ANIMAL PHYSIOLOGY LABORATORY. (2)
Hands-on laboratory exercises in animal physiology. Prereq: Previous or concurrent enrollment in BIO 550. (Same as BIO 650.)

PGY 660 BIOLOGY OF REPRODUCTION. (3)
Advanced study of current topics in reproductive biology. The course is comprised equally of student-led discussions and lectures given by faculty with research expertise in selected topics. Readings will be taken from current and classic literature. Topics covered include (but are not limited to) molecular and cellular endocrinology, hormone receptors and mechanism of action, reproductive neuroendocrinology, reproductive behavior, gametogenesis, fertilization, sexual differentiation, puberty, menopause and environmental effects on reproduction. Emphasis will be placed on the analysis and understanding of the experimental basis for current concepts in reproductive biology. Prereq: ASC/GY 601 and ASC 364 or BIO/PGY 502 or consent of instructor. (Same as ASC 660 and ASC 660.)

PGY 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

KEY: # = new course  * = course changed  † = course dropped  ¶ = course removed from Bulletin due to inactivity
Approved elective:

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<td>PHG 740</td>
<td>DISSERTATION RESEARCH</td>
<td>Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.</td>
</tr>
<tr>
<td>PHG 767</td>
<td>TOPICAL SEMINAR IN BEHAVIORAL NEUROSCIENCE</td>
<td>A study of selected topics in behavioral neuroscience with emphasis on recent research and theory. May be repeated to a maximum of nine credits. Prereq: Consent of instructor. This course may be elected to fulfill requirements in the psychology and physiology graduate programs. (Same as PSY 767.)</td>
</tr>
<tr>
<td>PHG 768</td>
<td>RESIDENCE CREDIT FOR THE MASTER'S DEGREE</td>
<td>May be repeated to a maximum of 12 hours.</td>
</tr>
<tr>
<td>PHG 769</td>
<td>RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE</td>
<td>May be repeated indefinitely.</td>
</tr>
<tr>
<td>PHG 771</td>
<td>PROSEMINAR IN CELL PHYSIOLOGY</td>
<td>A comprehensive discussion of topics in cellular physiology and biophysics using advanced texts and readings in the original literature. Includes such topics as biological membranes, transport mechanisms, effects of hormones on membranes. Prereq: Graduate student in physiology and biophysics or consent of Director of Graduate Study.</td>
</tr>
<tr>
<td>PHG 774</td>
<td>GRADUATE SEMINAR IN PHYSIOLOGY</td>
<td>(1)</td>
</tr>
<tr>
<td>PHG 791</td>
<td>RESEARCH IN PHYSIOLOGY</td>
<td>May be repeated to a maximum of 15 credits. Prereq: Consent of instructor.</td>
</tr>
<tr>
<td>PHG 814</td>
<td>PRINCIPLES OF HUMAN PHYSIOLOGY FOR DENTAL STUDENTS</td>
<td>This course enables student dentists to understand the basic principles of human physiology, especially as it relates to the practice of dentistry. The introduction of the course presents the basic physiology of cells, conducting and contracting tissues, lining and secretory tissues, and other special tissues. The course focuses on the major physiological systems and presents them at the system, cellular, and molecular levels; and emphasizes those aspects particularly relevant to dentistry — dentin sensitivity, dental and pulpal pain, muscle dysfunction, ischemic and, hypertensive heart disease, oral manifestations of endocrine abnormalities, temperature regulation, calcium-phosphate homeostasis, and the dental mineralized tissues. Upon successful completion of the course, student dentists will be able to rationally and scientifically apply basic cell, tissue, organ, and organ system function to clinical decision-making. Lectures with assigned reading: 68 hours. Prereq: OBI 812 or consent of the course director. (Same as OBI 814.)</td>
</tr>
<tr>
<td>PHG 815</td>
<td>FIRST-YEAR ELECTIVE, PHYSIOLOGY</td>
<td>(1-3) With the advice and approval of his or her faculty adviser, the first-year student may choose approved electives offered by the Department of Physiology and Biophysics. The intent is to provide the student an opportunity for exploration and study in an area which supplements and/or complements required course work in the first-year curriculum. Pass-fail only. Prereq: Admission to first year, College of Medicine.</td>
</tr>
<tr>
<td>PHG 818</td>
<td>HUMAN FUNCTION</td>
<td>(8) The course provides in-depth instruction on the physiological mechanisms of body function from the single cell to the organism level. The course is taught by medical scientists and clinicians. Teaching methodologies include didactic and Socratic lectures, small group discussions, demonstrations and live model and computer simulated laboratories. Lecture, 20 hours per week. Prereq: Admission to Medical School (first year). (Same as MD 818.)</td>
</tr>
<tr>
<td>PHG 825</td>
<td>SECOND-YEAR ELECTIVE, PHYSIOLOGY</td>
<td>(1-4) With the advice and approval of his or her faculty adviser, the second-year student may choose approved electives offered by the Department of Physiology and Biophysics. The intent is to provide the student an opportunity for exploration and study in an area which supplements and/or complements required course work in the second-year curriculum. Pass-fail only. Prereq: Admission to second-year medical curriculum and approval of adviser.</td>
</tr>
<tr>
<td>PHG 850-898</td>
<td>FOURTH-YEAR ELECTIVE FOR MEDICAL STUDENTS</td>
<td>(1-6) With the advice and approval of the faculty adviser and the Student Progress and Promotions Committee, the fourth-year student may choose approved electives offered by the various departments in the College of Medicine. The intent is to provide the student an opportunity to develop his fund of knowledge and clinical competence. Prereq: Admission to the fourth year, College of Medicine and/or permission of the Student Progress and Promotions Committee.</td>
</tr>
</tbody>
</table>

**PHG 850 RESEARCH IN PHYSIOLOGY**

**PHG 852 SYSTEMS PHARMACOLOGY**

This course is aimed to give a fundamental understanding of the pharmacodynamic action of drugs most commonly used in medical practice. Prereq: PHG 850; consent of instructor.

**PHG 853 PHARMACOLOGY OF ORGANS AND SYSTEMS**

Discussion of the pharmacodynamic principles underlying the action of cardiovascular, renal, gastrointestinal, and hematologic drugs, as well as drugs used in the treatment of infections. In addition, cancer chemotherapy drugs, drugs for treating artherosclerosis, principles of toxicology and drug metabolism and kinetics are discussed. Lecture, 77 hours; demonstration, four hours. Prereq: BCH 501 and 502, and PGY 502 or/and consent of faculty.

**PHG 855 MECHANISMS OF NEUROLOGIC DISEASE**

The objective of this course is to provide graduate students of diverse backgrounds with an introduction and overview of neurobiology. Topics covered will include neuronal and glial cell biology, neurotransmitters, signaling mechanisms, neuroanatomy, and neuronal development. The course is designed to provide a brief overview of each of the areas and introduce students to current research questions. The course will consist of lectures and informal presentations in a ‘Journal Club’ format. The course will be interdisciplinary and will be of interest to graduate students in anatomy, biology, biochemistry, immunology, pharmacy, pharmacology, physiology, psychology and toxicology and to neurology and neurosurgery residents. Prereq: Introductory biochemistry course, or equivalent, and consent of instructor. (Same as ANA/BCH/NER/PGY 605.)

**PHG 856 MECHANISMS OF NEUROLOGIC DISEASE**

The objective of this course is to provide graduate students of diverse backgrounds with an introduction and overview of current problems and controversies in neurobiology and clinical neurology. The course will cover a variety of illnesses including epilepsy, neurodegenerative diseases, stroke, psychiatric illness, pain, diseases of immune origin, motor dysfunction and inherited disorders. Prereq: ANA/BCH/NER/PGY/PHG 605 or consent of instructor. (Same as ANA/NER 606.)

**PHG 857 QUANTITATIVE PHARMACODYNAMICS: PHARMACOKINETICS**

Quantitative treatment of dynamics of drug absorption, distribution, metabolism and excretion, including development of both mathematical models and model-independent approaches for describing these processes. Prereq: PHR 802 (or equivalent), MA 114 and consent of instructor. (Same as PHR 612.)

**PHG 858 ADVANCED PHARMACODYNAMICS**

Small group discussion course for students of the natural sciences who, using drugs as research tools, wish to understand the basis of drug therapy. The principles and mechanism of drug action on biochemical and physiological systems is emphasized. Prereq: Consent of instructor.

**PHG 859 SPECIAL TOPICS IN PHARMACOLOGY**

(1-3) Detailed examination of current, significant topics in pharmacology such as: contemporary neuroscience methodology, molecular and cellular pharmacodynamics, transmembrane signaling. Course is designed to offer flexibility to students in different tracks, different emphasis in a given year and to utilize the special research interests in resident and visiting investigators. May be repeated to a maximum of six credits. Prereq: Consent of course director.

**PHG 860 PHARMACOLOGY OF CARDIOVASCULAR DRUG THERAPY**

PHARMACOLOGY

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PH 640 MOLECULAR PHARMACOLOGY. (3)
The intent of this course is to describe the molecular aspects of a variety of physiological systems that are subject to pharmacological manipulation. Emphasis will be on the molecular genetics, biochemistry, and subcellular organization and biology of these systems, and on the pharmacological techniques used to study these systems. Genetic diseases associated with these systems will also be described. The course will focus on areas of research which represent the forefront of modern pharmacological investigation. Prereq: PHA 522, PGY 502, BCH 501, 502, or consent of instructor. (Same as PHR/TOX 649.)

PH 658 ADVANCED NEUROPHARMACOLOGY. (3)
A study of the general theories of the mode of action of drugs upon nervous tissue and a review of the effects of anesthetics, sedatives, hypnotics, anesthetics, tranquilizers, psychotomimetics, analgesics, antidepressants, anti-convulsants and drugs affecting motor dyskinasias upon neurons, synapses and functional components of the central nervous system. Prereq: PGY 412G or equivalent and PHA 522 or equivalent; consent of instructor.

PH 663 DRUG METABOLISM AND DISPOSITION. (2)
Drug metabolism and disposition. Lectures and discussion of the chemistry and biochemistry of drug biotransformation with emphasis on the mixed-function oxidase system. Prereq: BCH 401G or 501, 502 or consent of instructor. (Same as TOX 663.)

PH 670 CHEMICAL CARCINOGENESIS. (3)
Lectures and discussion of the chemical and biochemical reactions of chemical carcinogens and their metabolites. Prereq: CHE 232, PHR 400; or BCH 501, 502. (Same as TOX 670.)

PH 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PH 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

PH 750 RESEARCH IN PHARMACOLOGY. (1-5)
May be repeated to a maximum of 15 credits.

PH 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

PH 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

PH 770 SEMINAR IN PHARMACOLOGY. (1)
May be repeated indefinitely.

PH 779 MEMBRANE SCIENCES COLLOQUIUM. (1)
Outstanding membrane scientists present their current research on biological and/or synthetic membranes. Students read a pertinent paper by the speaker prior to his/her talk and write a short paper on the talk; especially important is relevance of the main points of the talk to membrane science in general and the student’s own research in particular. May be repeated to a maximum of six credits. (Same as BCH/CHE/CME/PHR 779.)

PH 815 FIRST-YEAR ELECTIVE, PHARMACOLOGY. (1-4)
With the advice and approval of his or her faculty adviser, the second-year student may choose approved electives offered by the Department of Pharmacology. The intent is to provide the student an opportunity for exploration and study in an area which supplements and/or complements required course work in the second-year curriculum. Pass-fail only. Prereq: Admission to second-year medical curriculum and approval of adviser.

PH 840 CLINICAL DENTAL PHARMACOLOGY. (1)
This course will reinforce to fourth-year dental students the principles of basic and applied pharmacology enabling them to evaluate and manage patients with systemic and oral diseases. The course will be given before the Dental National Board Examination. This should help the students review for the pharmacology portion of the examination. Advances in drug therapy that have occurred since the basic pharmacology courses will be discussed. The course will be presented in both lecture and case presentation format to help the students understand and recognize the importance of pharmacologic agents in the management of their patients. Lecture: 16 hours. Prereq: OBI 812, OBI 814, OBI 822, OBI 826, CDS 821 CDS 831, and ODM 831. (Same as OBI 840.)

PH 842 ADVANCED CLINICAL PHARMACOLOGY AND ANESTHESIOLOGY. (6)
This course uses lectures, interactive small groups, and firsthand experience to introduce anesthesiology as it relates to pharmacology and physiology. The course also teaches pharmacology and therapeutics utilizing clinical cases. Students develop their own personal formularies during the course. Laboratory, 40 hours per week. Prereq: Admission to fourth year of medical curriculum. (Same as MD 842.)

PHI Philosophy

PHI 100 INTRODUCTION TO PHILOSOPHY: KNOWLEDGE AND REALITY. (3)
An introduction to philosophical studies with emphasis on issues of knowing, reality, and meaning related to human existence.

PHI 120 INTRODUCTORY LOGIC. (3)
A course which treats argumentation, syllogistic, and sentential logic. The focus will be on the use of formal methods in the construction and criticism of actual arguments, the aim being to inculcate standards of good reasoning, e.g., clarity, consistency and validity. Credit is not given to students who already have credit for PHI 320.

PHI 130 INTRODUCTION TO PHILOSOPHY: MORALITY AND SOCIETY. (3)
An introduction to philosophical studies with emphasis on a critical study of principles of moral action and social and political values.

PHI 211 INTRODUCTORY LOGIC. (3)
A course which treats argumentation, syllogistic, and sentential logic. The focus will be on the use of formal methods in the construction and criticism of actual arguments, the aim being to inculcate standards of good reasoning, e.g., clarity, consistency and validity. Credit is not given to students who already have credit for PHI 320.

PHI 212 INTRODUCTORY LOGIC. (3)
A course which treats argumentation, syllogistic, and sentential logic. The focus will be on the use of formal methods in the construction and criticism of actual arguments, the aim being to inculcate standards of good reasoning, e.g., clarity, consistency and validity. Credit is not given to students who already have credit for PHI 320.

PHI 251 PHILOSOPHY AND CLASSICAL PHYSICS. (3)
An historical introduction to the philosophical background of classical physics as the latter was developed by thinkers like Isaac Newton and James Clerk Maxwell. Concentrating on metaphysics and the philosophy of scientific method, this course includes a study of scientists and philosophers like Aristotle, Copernicus, Galileo, Leibniz, and Faraday. Prereq or concur: PHY 231 or consent of instructor.

PHI 260 HISTORY OF PHILOSOPHY I: FROM GREEK BEGINNINGS TO THE MIDDLE AGES. (3)
An introductory study of the development of Western philosophy from ancient through late medieval times including systematic work in logic, metaphysics, epistemology and ethics by such philosophers as Plato, Aristotle, Augustine and Aquinas.

PHI 270 HISTORY OF PHILOSOPHY II: FROM THE RENAISSANCE TO THE PRESENT ERA. (3)
An introductory study of the development of Western philosophy from early modern to recent times including systematic work in logic, metaphysics, epistemology and ethics by such philosophers as Occam, Descartes, Hume and Kant.

PHI 300 UNDERGRADUATE SEMINAR. (3)
An intensive study of special topics in philosophy with emphasis on current scholarship. The focus may be interdisciplinary or interdepartmental. Prerequisites appropriate to the specific topic will be listed in the schedule book for each offering. May be repeated to a maximum of six hours.

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Key: # = new course * = course changed † = course dropped ¶ = course removed from Bulletin due to inactivity
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHI 305</td>
<td>HEALTH CARE ETHICS.</td>
<td>(3)</td>
<td>A consideration of the ethical issues and difficult choices generated or made acute by advances in biology, technology, and medicine. Typical issues include: informed consent, healer-patient relationships, truth telling, confidentiality, problem of birth defects, abortion, placebos and health, allocation of scarce medical resources, genetic research and experimentation, cost containment in health care, accountability of health care professionals, care of the dying, and death.</td>
</tr>
<tr>
<td>PHI 310</td>
<td>PHILOSOPHY OF HUMAN NATURE.</td>
<td>(3)</td>
<td>A course introducing philosophy at the upper division level which studies various issues involved in analyzing what it means to be human, in the interest of developing a coherent conception of man. Answers will be sought to questions like these: Is there a human nature? What would differentiate the properly human from the nonhuman? What kind of relations tie a human being to environment, society, and history?</td>
</tr>
<tr>
<td>PHI 317</td>
<td>EXISTENTIALIST THOUGHT AND LITERATURE.</td>
<td>(3)</td>
<td>A survey of existentialism as a literary movement as well as a philosophical one, with emphasis upon their intersection and interaction. The course will trace the emergence of existentialist themes in modern thought and culture, and will analyze and assess the movements’ continuing significance.</td>
</tr>
<tr>
<td>PHI 320</td>
<td>SYMBOLIC LOGIC I.</td>
<td>(3)</td>
<td>A systematic study of sentential logic, elementary quantification, and the logic of identity. The student will acquire specific skills in symbolic methods of analysis which are necessary for further study in logic as well as useful for addressing complex issues in philosophy and other areas.</td>
</tr>
<tr>
<td>PHI 330</td>
<td>PROFESSIONAL ETHICS.</td>
<td>(3)</td>
<td>A study of ethical issues related to professional roles, especially those of physicians and lawyers. Among the topics to be considered are the nature and justification of professional responsibilities and duties; obligations of professions to society; the professional-client relationship and its rights and obligations; enforcement of codes of ethics.</td>
</tr>
<tr>
<td>PHI 333</td>
<td>AGRICULTURAL ETHICS.</td>
<td>(3)</td>
<td>This course examines the moral dilemmas which arise from the production, distribution and consumption of food in modern societies. Various theoretical positions, such as Libertarianism, Utilitarianism, Egalitarianism, are examined. In addition the course will consider how the right of everyone to an adequate diet can be justified as well as what that right implies for public policy decisions.</td>
</tr>
<tr>
<td>PHI 335</td>
<td>THE INDIVIDUAL AND SOCIETY.</td>
<td>(3)</td>
<td>An examination of several incompatible views concerning the relation between the individual and society, including radical individualism and collectivism, as well as more moderate theories. Attention will be given to contemporary as well as classical spokesmen for these views and emphasis will be placed upon relating these theories to contemporary social, cultural, and political issues.</td>
</tr>
<tr>
<td>PHI 337</td>
<td>INTRODUCTION TO LEGAL PHILOSOPHY.</td>
<td>(3)</td>
<td>A general introduction to basic concepts, institutions, and mechanisms of law. Understanding of the legal system and its methods is promoted through discussion of topics which include: basic legal reasoning, the function of the legal process, fundamental legal concepts and categories (such as property, crime, and contract).</td>
</tr>
<tr>
<td>PHI 338</td>
<td>MORALITY AND BUSINESS.</td>
<td>(3)</td>
<td>An introduction to business ethics. Emphasis on causes and solutions to the oppression of women. Topics may include philosophical perspectives and gender roles, images of women in society, violence against women, and reproductive choices.</td>
</tr>
<tr>
<td>PHI 340</td>
<td>INTRODUCTION TO FEMINISM AND PHILOSOPH.</td>
<td>(3)</td>
<td>Introduction to basic feminist thought from a philosophical perspective. Emphasis on various questions in metaphysics, epistemology, logic, and value theory, such as: the nature of the self; the role of perspectives in knowledge; the nature of reason and the criteria for justification in argumentation; feminist theories of morality and feminist theories of social justice.</td>
</tr>
<tr>
<td>PHI 343</td>
<td>ASIAN PHILOSOPHY.</td>
<td>(3)</td>
<td>An introduction to the main concepts, assumptions, problems and texts of one or more Asian philosophical traditions, such as Hinduism, Buddhism, Taoism, and Confucianism.</td>
</tr>
<tr>
<td>PHI 350</td>
<td>DEATH, DYING AND THE QUALITY OF LIFE.</td>
<td>(3)</td>
<td>A philosophical and interdisciplinary investigation of a cluster of prominent issues about the meaning of life and death, caring for dying persons, and the quality of life of the terminally ill. Among topics included are: death definitions and criteria; allowing to die vs. killing; euthanasia and suicide; life prolongation, ethics of care of the terminally ill; and rights of the dying.</td>
</tr>
<tr>
<td>PHI 361</td>
<td>BIOLOGY AND SOCIETY.</td>
<td>(3)</td>
<td>A study of the implications of biology for understanding and changing society. Emphasis is on sociobiology and the value of viewing social behavior as a product of adaptive evolution by natural selection. Representative philosophical issues include biological constraints on human nature and society, genetic engineering, reductionism, the scientific method, and bioethics. Prereq: A college course in biology or consent of instructor.</td>
</tr>
<tr>
<td>PHI 395</td>
<td>INDEPENDENT WORK.</td>
<td>(3)</td>
<td>Open only to students who have distinguished themselves in philosophy or in allied subjects. May be repeated to a maximum of 12 credits. Prereq: Major and standing of 3.0 or in department.</td>
</tr>
<tr>
<td>PHI 399</td>
<td>EXPERIENTIAL LEARNING.</td>
<td>(1-6)</td>
<td>To provide the opportunity for students to earn credit for work-study experience. The student must work with a faculty member to describe the nature of the experience, the work to be performed, the accompanying philosophical reflection and study, appropriate course credit for the work, and criteria by which the work may be evaluated. This information must be written and filed in the Philosophy Department and the Office for Experiential Education prior to the student’s registration for the course. May be repeated to a maximum of 12 credits. Pass-fail only. Prereq: Consent of instructor and department chairperson; completion of a departmental learning agreement.</td>
</tr>
<tr>
<td>PHI 500</td>
<td>TOPICS IN PHILOSOPHY (Subtitle required).</td>
<td>(3)</td>
<td>Topics that cross traditional systematic or historical lines in philosophy or that relate philosophy to topics or periods in other disciplines. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>PHI 520</td>
<td>SYMBOLIC LOGIC II.</td>
<td>(3)</td>
<td>An intermediate course in symbolic logic which reviews sentential logic, develops further the logic of quantification, and introduces metalogical issues such as the construction, consistency, and completeness of deductive systems. Prereq: PHI 320 or consent of instructor.</td>
</tr>
<tr>
<td>PHI 540</td>
<td>FEMINIST PHILOSOPHY.</td>
<td>(3)</td>
<td>An introduction to feminist philosophical theory, including feminist treatments of various questions in metaphysics, epistemology, logic, and value theory, such as: the nature of the self; the role of perspectives in knowledge; the nature of reason and the criteria for justification in argumentation; feminist theories of morality and feminist theories of social justice.</td>
</tr>
<tr>
<td>PHI 503</td>
<td>TOPICS IN ANCIENT PHILOSOPHY.</td>
<td>(3)</td>
<td>A study of representative texts and issues in Ancient Philosophy with special attention to historical continuity and the interrelations of thinkers and problems. Possible Topics: Pre-Socratic Philosophers, Plato, Aristotle, Stoicism, Epicureanism, Scepticism. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>PHI 504</td>
<td>ISLAMIC AND JEWISH PHILOSOPHY AND THE CLASSICAL TRADITION.</td>
<td>(3)</td>
<td>A study of representative texts and issues in Islamic and Jewish philosophy with special attention to the historical continuity with the Greek philosophical tradition and the interrelations of thinkers and problems. Possible topics: the commensurability of philosophy and (revealed) law, the creation or eternity of the world, the nature of prophecy, the human good, the nature of God and divine language. Prereq: PHI 260 or consent of instructor.</td>
</tr>
<tr>
<td>PHI 506</td>
<td>TOPICS IN MEDIEVAL PHILOSOPHY.</td>
<td>(3)</td>
<td>An investigation of issues in Medieval Philosophy. Topics will be chosen which illustrate continuity both with Ancient Greek Sources and with problems in Modern Philosophy. Possible Topics: Neo-Platonism, Faith and Reason, Freedom and Determinism, Universalism, The Existence of God, Renaissance reactions. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>PHI 509</td>
<td>TOPICS IN THE HISTORY OF MODERN PHILOSOPHY.</td>
<td>(3)</td>
<td>A selective study of representative issues and texts in modern philosophy, with special emphasis upon historical continuity and interrelation of thinkers and problems. Possible topics: British empiricism; Leibniz and Locke; Descartes and his critics; Hobbes and Rousseau; Hume and Kant; philosophy and the rise of modern science. May be repeated to a maximum of six credits.</td>
</tr>
<tr>
<td>PHI 513</td>
<td>NINETEENTH CENTURY PHILOSOPHY.</td>
<td>(3)</td>
<td>An examination of the major topics and trends in 19th century philosophy. Prereq: PHI 270 or consent of instructor.</td>
</tr>
</tbody>
</table>
PHI 514 AMERICAN PHILOSOPHY. (3)
A study of the development of philosophy in America from colonial to recent times with attention to religious, political, literary and scientific influences on American thought. The focus will be on the pragmatic spirit that was the moving force from 19th century idealism to 20th century naturalism, with emphasis on the works of such thinkers as Royce, Peirce, James and Dewey.

PHI 515 CONTEMPORARY PHILOSOPHY: THE ANALYTIC TURN. (3)
A survey of several 20th century philosophical movements, such as logical positivism and ordinary language philosophy, whose members agree that careful attention to language is one of the keys to the resolution of philosophical problems. The works of representative thinkers such as Moore, Russell, the Vienna Circle, Wittgenstein and Austin will be studied.

PHI 516 CONTEMPORARY PHILOSOPHY: PHENOMENOLOGICAL DIRECTIONS. (3)
A study of 20th century philosophies represented by the works of thinkers such as Husserl and Heidegger, Gadamer and Ricoeur, Habermas and Apel. Generally based in reflection on human experience, these philosophies undertake a radical criticism of common conceptions of human nature while variously emphasizing rationality, ontology, language, or social and historical context. Prereq: PHI 270 or consent of instructor.

PHI 517 EXISTENTIALISMS. (3)
A systematic study of the fundamental concepts and problems of existentialism. Readings selected from such philosophers as Kierkegaard, Nietzsche, Sartre, Marcel, Heidegger, and Jaspers.

GROUP B

PHI 530 ETHICAL THEORY. (3)
A study of ethical theories by detailed examination of a few selected works. Theories considered may include naturalism, intuitionism, noncognitivism, utilitarianism, universalizability, and natural law.

PHI 535 SOCIAL AND POLITICAL PHILOSOPHY. (3)
A critical examination of some philosophical problems concerning the nature and evaluation of social and political organizations. For example, questions concerning the nature, justification, and limits of political power may be explored in connection with a study of important classical positions. Prereq: One course in philosophy.

PHI 537 PHILOSOPHY OF LAW. (3)
Concept of law; relations between law and morals; nature of legal reasoning; analysis of legal concepts; justification of punishment. Pass/fail basis only for law students. (Same as LAW 837.)

PHI 545 PHILOSOPHY OF RELIGION. (3)
An analysis of the philosophical issues raised by religion, such as the problem of religious knowledge, the nature of religious language, science and religion, concepts of God, death, and evil.

PHI 592 AESTHETICS. (3)
Problems of method in aesthetics; major types of aesthetic theory. Aesthetic materials of the arts in literature, music, and the space arts. Form and types of form. Meaning in the arts. Interrelations of the arts. Lectures, discussions, reports. (Same as A--H 592.)

GROUP C

PHI 550 PHILOSOPHICAL PROBLEMS IN KNOWLEDGE AND REALITY. (3)
Critical examination of issues regarding the foundations of knowledge, the nature of reality and the relation between the two. Evidence, belief, certainty, perception and justification will be among problems considered. Understandings of truth, existence, causality, freedom, time, space and matter will also be attended to. Prereq: PHI 100 or PHI 260 or PHI 270 or equivalent.

PHI 560 PHILOSOPHY OF SCIENTIFIC METHOD. (3)
An examination of the logical and epistemological foundations of empirical science, including fundamentals of concept formation, criteria of cognitive significance, issues of explanation, interpretation, and prediction, and testing and confirmation of theories and laws. Prereq: PHI 120 or equivalent or consent of instructor.

PHI 561 PHILOSOPHICAL PROBLEMS IN THE NATURAL SCIENCES (Subtitle required). (3)
A systematic examination of selected conceptual and/or metaphysical problems in the natural sciences. Possible topics include: reductionism, teleology, causality and determinism, the structure of space-time, and the “anthropic principle” in cosmology. Prereq: PHI 120 or PHI 320, or two semesters of natural sciences or consent of instructor.
PHR Pharmacy

PHR 222 DRUGS, MEDICINES, AND SOCIETY. (3)
The course is designed to enable the university graduate to be sufficiently sophisticated in his understanding of the physiological and behavioral effects of medicines, environmental toxicants, and psychoactive chemicals so that he may make informed decisions regarding their use in his life, home and community. This course provides such information in the context of drug use and abuse, drug action on the body, control, use and misuse in a modern society. (Note: It is felt that this course might be of particular interest to freshmen.)

PHR 336 PHYSIOLOGIC BASIS FOR THERAPEUTICS I. (4)
Basic concepts of human anatomy and physiology integrated with an introduction to pathophysiology and the pharmacodynamics of typical drugs. Strong emphasis is placed on homeostasis, cell and nerve function and the organization of the central and autonomic nervous systems. Lecture, four hours. Prereq: BIO 104, 105; CHE 232 and PHY 203.

PHR 337 PHYSIOLOGIC BASIS FOR THERAPEUTICS II. (3)
A continuation of PHR 336 involving the integrated physiology of the cardiovascular, renal and pulmonary systems with an introduction to the pathophysiology of each system and the pharmacodynamics of typical drugs. Lecture, three hours. Prereq: PHR 336.

PHR 340 PRINCIPLES OF MEDICINAL CHEMISTRY. (4)
A course designed to introduce the fundamental concepts of the application of chemical principles to the study of medicinal agents. Basic heterocyclic chemistry as is needed to develop the chemistry of pharmaceutically active molecules. Physicochemical properties of drugs and their relation to physiological activity, and fundamental consideration of the metabolic changes in drug molecules are major areas of development of the course presentation. Prereq or concur: PHR 400.

PHR 395 INDEPENDENT WORK IN PHARMACEUTICAL CHEMISTRY. (1-3)
Selected problems of interest from the general field of pharmaceutical chemistry. May be repeated to a maximum of six credits. Prereq: Pharmacy major and standing of 3.0 in major. Consent of instructor.

PHR 400 BIOCHEMISTRY. (4)
A fundamental course in the chemistry and interrelationships of carbohydrates, lipids, and proteins, as well as the role of enzymes, vitamins, and hormones in physiological processes. Prereq: CHE 232, 233, or equivalent.

PHR 474 INDEPENDENT PROBLEMS IN TOXICOLOGY. (1-3)
Selected problems requiring literature and laboratory research are designed to meet specific needs of graduate minors in toxicology and satisfy professional elective requirements for pharmacy students. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 475 INDEPENDENT PROBLEMS IN PHARMACOGNOSY. (1-3)
Selected problems requiring literature and laboratory research are designed to meet specific needs of graduate minors in pharmacognosy and satisfy professional elective requirements for pharmacy students. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 476 INDEPENDENT PROBLEMS IN PHARMACOLOGY. (1-3)
Selected problems requiring literature and laboratory research are designed to meet specific needs of graduate minors in pharmacology and satisfy professional elective requirements for pharmacy students. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 510 MODERN METHODS IN PHARMACEUTICAL ANALYSIS. (5)
A course which deals with the application of modern analytical methods, primarily instrumental methods, in the determination of the structure, purity, and quality of drugs and pharmaceuticals. Laboratory exercises include analysis of raw materials and finished dosage forms. Lecture, three hours; laboratory, four hours. Prereq: CHE 226.

PHR 520 SPECIAL TOPICS IN PHARMACY LAW. (2)
Discussion of the legal framework and special legal issues in pharmacy practice. Topics will include application of antitrust laws to pharmacy, patent and trademark issues relevant to pharmacy, legal issues related to prescription drug insurance programs, professional liability and legislative issues such as drug product selection. Prereq: PHR 831.

PHR 530 RADIOPHARMACEUTICS. (3)

PHR 545 STERILE PARENTERALS AND DEVICES. (2-3)
The course will describe the fundamental concepts, principles and techniques involved in the characterization, development, evaluation and preparation of sterile products. Lecture, two credits; lecture with laboratory, three credits. Prereq: PHR 846 and PHR 825 or equivalent and consent of instructor.

PHR 595 INDEPENDENT PROBLEMS IN PHARMACY ADMINISTRATION. (1-3)
Selected problems of interest in the areas of behavioral, economic, ethical, historical, legal, psychological and social aspects of pharmacy. Methods may include literature search, surveys, field studies and experimental design. The course may serve as a professional elective for the pharmacy student and as a graduate course for the graduate student. May be repeated for a maximum of six credits. Prereq: Consent of the instructor.

PHR 612 QUANTITATIVE PHARMACODYNAMICS: PHARMACOKINETICS. (3)
Quantitative treatment of dynamics of drug absorption, distribution, metabolism and excretion, including development of both mathematical models and model-independent approaches for describing these processes. Prereq: PHR 802 (or equivalent), MA 114 and consent of instructor. (Same as PHA 612.)

PHR 620 NATURAL PRODUCTS CHEMISTRY. (3)
Chemistry of natural products. A course designed to establish a bridge between organic chemistry, biochemistry and biology in terms of such areas as biogenesis, biotransformations, isolation, degradation, structure elucidation, and synthesis of natural products of interest as medicinal agents. Prereq: PHR 400 or equivalent and consent of instructor.

PHR 622 ADVANCED BIOPHARMACEUTICS. (2)
An advanced treatment of the factors affecting drug availability from dosage forms and the influence of the route of administration and the dosage regimen on drug availability. Prereq: PHR 612.

PHR 630 PHARMACEUTICAL RATE PROCESSES. (3)
Kinetics of reactions of pharmaceutical interest; mechanisms of drug decomposition and theoretical approaches to stabilization and preservation; accelerated stability analysis. Prereq: Physical chemistry and chemical kinetics.

PHR 631 EQUILIBRIUM PHENOMENA IN PHARMACEUTICAL SYSTEMS. (3)
An advanced study in special topics of a physical chemical nature which are applicable to pharmacy, with special emphasis on physical properties and molecular structure, solubility, complexation and equilibria in solution. Prereq: Physical chemistry.

PHR 645 NEUROTOXICOLOGY. (2)
Multidisciplinary discussions of the major sites and mechanisms of drug/chemical-induced nervous system toxicity. Presentations by faculty and graduate students. Prereq: BCH 501 and 502, PGY 502 and PHA 522 or equivalent and consent of instructor. (Same as TOX 645.)
PHR 647 INTRODUCTION TO MOLECULAR PHARMACOTHERAPEUTICS. (3)
A discussion of the development of potential therapeutic entities using molecular biotechnology. Recent advances in the design and delivery of target-specific treatments such as special peptides, monoclonal antibodies and gene therapies will be the primary focus. Prereq: BCH 501 and 502, BCH 401G or equivalent or consent of instructor.

PHR 649 MOLECULAR PHARMACOLOGY. (3)
The intent of this course is to describe the molecular aspects of a variety of physiological systems that are subject to pharmacological manipulation. Emphasis will be on the molecular genetics, biochemistry, and subcellular organization and biology of these systems, and on the pharmacological techniques used to study these systems. Genetic diseases associated with these systems will also be described. The course will focus on areas of research which represent the forefront of modern pharmacological investigation. Prereq: PHA 522, PGY 502, BCH 501, 502, or consent of instructor. (Same as PHA/TOX 649.)

PHR 664 THEORY AND PRACTICE OF DRUG METABOLISM. (3)
A broad overview of the chemistry of drug biotransformation with emphasis on experimental considerations and analytic methodology for the isolation and identification of metabolites and the study of metabolic processes. Prereq: BCH 501 and CHE 538 or consent of instructor.

PHR 668 PSYCHOTHERAPEUTICS FOR ADVANCED NURSING PRACTICE. (3)
This course provides advanced background in psychotherapies for psychiatric/mental health nurse practitioners. Psychiatric disorders and their pharmacotherapy are addressed with emphasis on indications for use, mechanisms of action, side effects, pharmacokinetics and nursing management problems. Prereq: Graduate standing in nursing or permission of instructor. (Same as NUR 668.)

PHR 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PHR 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

*PHR 760 TOPICS IN PHARMACEUTICAL SCIENCES. (1-4)
This course deals with emerging concepts in pharmaceutical sciences which are not being covered in other courses. May be repeated to a maximum of 10 hours. Prereq: Consent of instructor.

PHR 762 BIOORGANIC MECHANISMS. (3)
An in-depth discussion on the bioorganic chemistry aspects of the active sites of enzymes and drug receptors, the molecular basis of drug design, and principles of drug metabolism. Within these topics, the mode of action of some of the major coenzymes and drugs will be discussed from a mechanistic chemistry point of view. Prereq: CHE 538, CHE 633, BCH 501 or consent of instructor.

PHR 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

PHR 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE. (0-12)
May be repeated indefinitely.

PHR 774 GRADUATE SEMINAR IN PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS. (1)
Reports and discussion of current research and literature of general interest in the area of pharmacology and experimental therapeutics. The grade will be based on the presentation of the required annual seminar which will be objectively evaluated by the Faculty of the Division of Pharmacology and Experimental Therapeutics. May be repeated to a maximum of eight credits. Prereq: Graduate standing.

PHR 776 SEMINAR IN PHARMACEUTICAL SCIENCES I. (1)
Reports and discussion of pertinent research and literature in the pharmaceutical sciences. Required of all graduate students. Prereq: Graduate standing.

PHR 778 SEMINAR IN PHARMACEUTICAL SCIENCES II. (1)
Reports and discussion of current research and literature in the pharmaceutical sciences. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 779 MEMBRANE SCIENCES COLLOQUIUM. (1)
Outstanding membrane scientists present their current research on biological and/or synthetic membranes. Students read a pertinent paper by the speaker prior to his/her talk and write a short paper on the talk; especially important is relevance of the main points of the talk to membrane science in general and the student’s own research in particular. May be repeated to a maximum of six credits. (Same as BCH/CHM/CMH/PHA 779.)

PHR 780 SPECIAL PROBLEMS IN PHARMACEUTICAL SCIENCES. (1-6)
Selected problems of laboratory or literature nature in which a student pursues a topic of interest to him under the supervision of a faculty member particularly qualified in that area. May be repeated once. Prereq: Consent of instructor.

PHR 790 RESEARCH IN PHARMACEUTICAL SCIENCES. (1-12)
Research work to be conducted in selected areas of pharmaceutical sciences. Prereq: Approval of student’s special committee and consent of instructor.

PHR 804 PHARMACOGENETICS I: ANALYSIS AND PHYSICAL PHARMACY. (4)
A study of the analytical techniques commonly used to conduct drug quality assurance and determine drug concentrations in biologic fluids. Emphasis is placed on combined standards, pharmaceutical literature and the physical chemical principles of drug dosage form design. Demonstration of competence in pharmaceutical calculations by examination is required for passing the course.

PHR 805 PHARMACOGENETICS II: DRUG DELIVERY SYSTEMS. (4)
A continuation of PHR 804, concentrating on contemporary drug delivery systems, principles of compounding, and methods of manufacture. Emphasis is placed on the design, function, use, and evaluation of modern drug delivery systems. Laboratory experiences are directed toward a study of the analytical and physical-chemical aspects of dosage form design and quality assurance. Lecture, three hours; laboratory, four hours. Prereq: PHR 804.

PHR 806 PHARMACEUTICS III: BIOPHARMACEUTICS AND PHARMACOKINETICS. (4)
A continuation of PHR 805, concentrating on the physical-chemical principles underlying in vivo dosage form performance and the absorption, distribution, metabolism, and excretion of drugs. Emphasis is placed on the biopharmaceutics of drug product performance and the pharmacokinetic calculation of dosage regimens. Lecture, three hours; laboratory, four hours. Prereq: PHR 805.

PHR 811 COMPUTER APPLICATIONS IN PHARMACY. (2)
A course designed to educate students in the basic knowledge of attitudes and skills required to meet the pharmaceutical needs of the elderly. Topics include discussions of the aging process, physiological and psychological changes in the elderly, how these changes influence patient compliance and the responses to drug and nondrug treatments, monitoring drug use in long-term care facilities, and special community services available to the elderly. Prereq: PHR 849, 852, 853, 854 and 856 or permission of instructor.

PHR 812 COMMUNICATION SKILLS FOR PHARMACISTS. (3)
An analysis and application of the factors that promote or hinder successful communication between pharmacists and patients, pharmacists and the general public, and pharmacists and other health care personnel. The course is designed to make the student more aware of the importance of the role of communication in interpersonal interaction and the consequences of poor communication. The primary focus is to improve upon the student’s ability to communicate effectively in specific situations. Prereq: BSC 331, and PHR 831.

PHR 813 GERIATRIC PHARMACY. (3)
A course designed to educate students in the basic knowledge of attitudes and skills required to meet the pharmaceutical needs of the elderly. Topics include discussions of the aging process, physiological and psychological changes in the elderly, how these changes influence patient compliance and the responses to drug and nondrug treatments, monitoring drug use in long-term care facilities, and special community services available to the elderly. Prereq: PHR 849, 852, 853, 854 and 856 or permission of instructor.

PHR 826 INTRODUCTION TO NUCLEAR PHARMACY. (3)
The subject matter in this course includes: an introduction to basic atomic structure, radioactivity, detection of radiation, interactions of radiation with matter, radiation safety, dosimetry, the major emphasis being placed on radiation biological and nuclear medicine instrumentation. Prereq: PHR 806 and consent of instructor.

PHR 828 NUCLEAR PHARMACY EXTERNSHIP. (4, 8, 12, or 16)
This externship provides the student with an integrated practice experience in the provision of nuclear pharmaceutical services in various practice settings. Each four-credit block consists of four weeks of full time (40 hr/week) directed externship experience. The student may elect the externship experience in blocks of four credits. May be repeated to a maximum of 16 credits. Prereq: PHR 827 and consent of instructor.
PHR 831 PHARMACY MANAGEMENT AND HEALTH CARE SYSTEMS.  (4)
An introduction to the basic concepts, principles and methods of pharmacy management applicable to all practice settings with emphasis on practice alternatives, management approaches and styles, organizational principles, behavior and forms, personnel, purchasing and inventory control, pricing, professional fees, and pharmacy services and patronage. Topics are discussed within the framework of the health care delivery system in the United States, and the role of the pharmacist within these systems and within professional organizations. Prereq: BSC 331, PHR 303.

PHR 832 ADVANCED COMMUNITY PRACTICE MANAGEMENT.  (2)
A study of the principles and methods unique to the management of a community pharmacy, building on previous foundations and focusing on the entrepreneurial aspects of management. Prereq: PHR 831 and consent of instructor.

PHR 833 ADVANCED INSTITUTIONAL PRACTICE MANAGEMENT.  (2)
Application of management principles to institutional and group practices. Emphasis is on the acquisition, distribution and control of drugs by pharmacists in the institutional practice settings and the justification, establishment and evaluation of clinical pharmacy services. Prereq: PHR 831, PHR 848.

PHR 835 PHARMACEUTICAL LAW.  (3)
A study of important legislation, regulations and rulings related to the practice of pharmacy. Prereq: PHR 831.

PHR 848 INSTITUTIONAL PRACTICE AND STERILE PRODUCTS.  (4)
An introduction to the practice of pharmacy in institutional settings and clinics. Emphasis is placed on principles of parental drug preparation, home health care and the delivery of pharmaceutical services in group practices. Lecture with some laboratory experiences and demonstrations. Prereq: PHR 805; coreq: PHR 849.

PHR 849 DISPENSING PHARMACEUTICALS.  (3)
A discussion of the principles of dispensing medications with emphasis on patient counseling, patient monitoring, drug interactions and physical-chemical incompatibilities involved in compounding. Lecture; two hours; laboratory, three hours. Prereq: PHR 806, PHR 830; coreq: PHR 848.

PHR 850 PHARMACOTHERAPEUTICS: IMMUNE SYSTEMS.  (4)
A study of the immune systems, immunotherapy, and select autoimmune diseases and their treatment. The course includes a discussion of neoplasias and anti-neoplastic therapy. Prereq or coreq: PHR 337.

PHR 851 PHARMACOTHERAPEUTICS: NERVOUS SYSTEMS.  (5)
A study of human disease processes and rational pharmacotherapeutics relating to the autonomic and central nervous systems. Emphasis is placed on the scientific principles of pathophysiology, pharmacology and toxicology, the incorporation of these principles to the clinical application of modern drug therapy, and how these principles can be utilized in pharmacy practice. Prereq: PHR 805, PHR 340, PHR 337.

PHR 852 PHARMACOTHERAPEUTICS: CARDIOPULMONARY AND RENAL SYSTEMS.  (5)
An extension of PHR 851 dealing primarily with cardiovascular, renal and respiratory pathologies and the agents used in their treatment. Prereq: PHR 851.

PHR 853 PHARMACOTHERAPEUTICS: ENDOCRINE SYSTEMS.  (4)
A study of the physiology, pathology and therapeutics of the endocrine system. A discussion of principles of toxicology and the treatment of exposure to select chemicals is included. Prereq: PHR 337; coreq: PHR 851.

PHR 854 PHARMACOTHERAPEUTICS: NUTRITIONAL AND DERMATOLOGIC SYSTEMS.  (3)
An extension of PHR 851, concentrating on the physiology and major pathologies of the gastrointestinal and dermatologic systems, the agents used in their treatments, and the problems and treatments of nutritional and hematologic disorders. Prereq: PHR 851.

PHR 856 CHEMOTHERAPEUTICS.  (3)
An extension of PHR 851, concentrating on infectious diseases and agents used in their treatment. Prereq: PHR 850, coreq: PHR 806.

PHR 865 DISEASE PROCESSES I.  (5)
An interdisciplinary course in which in-depth study of specific disease processes, especially the quantifiable, pathognomonic parameters permit the student to develop a unique understanding of the pathologic factors influencing clinical drug use. Prereq: PHR 849,852, 853, 854 and 856.

PHR 866 APPLIED THERAPEUTICS I.  (5)
An in-depth integration of patient factors including age, history, concurrent disease states, medications, allergies, renal and hepatic function, and drug product factors including bioavailability, pharmacokinetics, efficacy, toxicity, risk to benefit ratios, and cost in the application of drug therapy to specific patient situations. Also included are discussions of the prominent considerations relative to patient education about their disease and therapy. Prereq: PHR 849, 852, 853, 854 and 856.

PHR 867 DISEASE PROCESSES II.  (4)
A continuation of PHR 865. Prereq: PHR 865.

PHR 868 APPLIED THERAPEUTICS II.  (5)
A continuation of PHR 866, including a presentation of physical assessment techniques necessary for monitoring drug response. Prereq: PHR 866.

PHR 870 CLINICAL ORIENTATION CLERKSHIP.  (8)
This course acquaints the student with the techniques and various considerations involved in the diagnosis and evaluation of disease states and their treatment. It affords the student opportunity to gain an appreciation of the scientific, social, emotional and psychological aspects of illness and provides the student with ability to work with other health professionals. Offered for letter grade credit only (A, B, C, D, E, F). Prereq: PHR 812, 848, 849, 850, 853, 854 and 856.

PHR 872 NONPRESCRIPTION PHARMACEUTICALS AND SUPPLIES.  (4)
A study of various nonprescription pharmaceuticals, medical and surgical supplies, and appliances commonly found in community pharmacy practice. Their evaluation, rational use and therapeutic efficacy will be stressed. The use of home remedies and their limitations in the treatment of minor ailments will be considered. Prereq: PHR 850, PHR 851, PHR 853; coreq: PHR 848, 849, 852, and 854.

PHR 874 DRUG LITERATURE EVALUATION.  (3)
This course apprises the student of the pharmacological and toxicological principles and techniques employed in the clinical evaluation of drugs and enables the student to use more effectively the clinical literature. Prereq: PHR 852, PHR 853, PHR 854 and PHR 856.

PHR 875 CLINICAL PHARMACOKINETICS.  (4)
Application of pharmacokinetic principles to drug dosing on an individual patient basis, with emphasis on those drugs which have narrow therapeutic ranges or have unique pharmacokinetic or pharmacologic properties. Prereq: PHR 806 or consent of instructor.

PHR 881 PHARMACY PRACTICE EXTERNSHIP.  (8)
This externship is designed to provide the student with a faculty-directed, integrated experience in the provision of pharmaceutical services in a variety of patient care settings under the supervision of selected pharmacy practitioners on a one-to-one basis of student to practitioner. This experience includes participation in traditional practice settings and may involve participating in new and innovative pharmacy practice models. The course consists of two four-week rotations which are full-time (not less than 40 hours per week) directed externship experiences. Offered on a pass/fail basis only. Prereq: PHR 849, 850, 853, 854, 856, permission of instructor, and minimum 2.0 pharmacy cumulative GPA.

PHR 882 PHARMACY PRACTICE CLERKSHIP: MEDICINE.  (4)

PHR 883 PHARMACY PRACTICE CLERKSHIP: AMBULATORY CARE.  (4)

PHR 884 PHARMACY PRACTICE CLERKSHIP: SPECIALTY AREAS.  (4)

PHR 885 PHARMACY PRACTICE EXTERNSHIP ELECTIVE.  (4)

PHR 886 PHARMACY PRACTICE CLERKSHIP.  (4)
A structured set of rotations designed to provide clinical experience in the use of drugs for the treatment of diseases. Students will be assigned to a variety of patient care areas on a full-time basis under the supervision of a faculty preceptor. Emphasis is placed on the active participation of the student in the provision of contemporary pharmaceutical care in different environments. The experiences provide the opportunity to integrate material presented in previous courses and stress outcome oriented decision making in clinical situations regarding drug therapy. May be repeated to a maximum of 40 credits. Prereq: PHR 867, 868, 874, 875, minimum 2.0 pharmacy GPA, required immunizations.
PHR 890 CLINICAL PHARMACY SEMINAR. (1) Topics in areas of clinical pharmacy concepts and principles of practice emphasizing the technical and professional knowledge and abilities required for involvement of the pharmacist in the health care team. May be repeated to a maximum of two credits. Prereq: Admission to the Doctor of Pharmacy program.

PHR 892 CLINICAL DRUG COMMUNICATIONS. (1-5) The course is designed as a natural continuation of PHR 874 and serves the specific purpose of providing instruction and experience of such a nature and quality as to promote the professional role of the pharmacist in the communication of clinical pharmacology and therapeutics information. May be repeated to a maximum of 10 credits. Lecture, one hour; laboratory, four 16 hours.

PHR 895 INDEPENDENT PROBLEMS IN CLINICAL PHARMACY. (1-3) Selected problems in patient care, drug information, pharmacy administration, and pharmaceutical technology as related to pharmaceutical services. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 896 INDEPENDENT PROBLEMS IN PHARMACY. (1-3) Selected problems pertaining to the various aspects of pharmacy which may include such problems as pharmaceutical procedures, pharmaceutical formulations, pharmaceutical history, and pharmaceutical economics. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PHR 911 PHYSIOLOGICAL BASIS FOR THERAPEUTICS I. (4) Integrated concepts of human organ system functions with particular emphasis on the physiology of the central and autonomic nervous system, the cellular and molecular mechanisms of neurotransmission and transduction and the response of target issues. The course includes an introduction to the pathopharmacology of each system and the pharmacodynamics of therapeutic agents as a framework for discussion. Variable mixtures of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 912 PHYSIOLOGICAL CHEMISTRY AND MOLECULAR BIOLOGY I. (3) The first of a two course sequence covering integrated concepts of human biochemistry from a physiological viewpoint, functional group chemistry essential to biology, key structural and functional relationships of the biomolecules in living systems, energy metabolism emphasizing inter organ relationships and an in depth discussion of information storage and transfer. The course includes an introduction to common metabolic diseases and the therapeutic agents used in those diseases as a framework for discussion. Variable mixtures of lecture, group discussions and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 913 PHARMACOLOGICAL BASIS OF THERAPEUTICS: ANTIBIOTICS. (3) A study of the pathophysiology and microbiology of infectious diseases concentrating on the pharmacology of the therapeutic agents (antibiotics) used to treat those diseases, including discussions of their rational use. Variable mixture of lectures, discussions and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 914 BASIC PRINCIPLES OF PHARMACEUTICAL SCIENCE: DRUG DESIGN. (3) The first course of a three course sequence dealing with the principles of medicinal chemistry and pharmaceutics. Brief descriptions of the drug development process, routes of administration, dosage forms, literature and biopharmaceutics followed by discussions of the design of molecules to produce safe and effective therapeutic responses in humans and the properties of drug molecules which are important in their formulation into drug products. Variable mixture of lectures, discussions and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 915 NONPRESCRIPTION PHARMACEUTICALS AND SUPPLIES I. (2) A study of various nonprescription pharmaceuticals, medical and surgical supplies and appliances commonly found in ambulatory pharmacy practice sites, their rational use and therapeutic efficacy. Decision making skills for ambulatory patient triage are emphasized. The use of home remedies and their limitations in the treatment of minor ailments is considered. Variable mixture of lecture, discussions and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 916 NONPRESCRIPTION PHARMACEUTICALS AND SUPPLIES II. (2) A continuation of PHR 915. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy and PHR 915.

PHR 919 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE II. (4) A continuously evolving integration of the administrative, legal, ethical, communicative, problem solving, social, behavioral and practical skills required for contemporary and future pharmacy practice often utilizing principles presented in the corequisite courses as the introductory framework for discussion or the basis for the problem cases to be covered. In addition, current topics of debate and controversial issues within health care in general and pharmacy care in particular are studied. This course is the initial offering in a sequence designed to balance the theoretical perspectives of the professional aspects of pharmacy with practical applications while simultaneously creating an environment to nurture the caring aspects of the profession. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development. Coreq: Required PHR 91X series courses.

PHR 921 PHYSIOLOGICAL BASIS FOR THERAPEUTICS II. (4) A continuation of PHR 911 covering integrated concepts of human organ system functions with particular emphasis on the physiology of the cardiovascular, renal, pulmonary and endocrine systems. The course includes an introduction to the pathopharmacology of each system and the pharmacodynamics of prototype therapeutic agents as a framework for discussion. Variable mixture of lecture, group discussions and independent study. Prereq: PHR 911 and admission to the first year, College of Pharmacy.

PHR 922 PHYSIOLOGICAL CHEMISTRY AND MOLECULAR BIOLOGY II. (3) A continuation of PHR 912. Variable mixture of lectures, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy and PHR 912.

PHR 923 PHARMACOLOGICAL BASIS FOR THERAPEUTICS: NUTRITION, HEALTH PROMOTIONS. (3) Consideration of the role of the pharmacist in health promotion and disease prevention including both pharmacologic and non-pharmacologic methods. Major problems of nutrition and certain metabolic chronic disorders for which nutrition plays a pivotal role will be addressed including hypertension, cancer, and eating disorders. In addition the pharmacology of drugs affecting the gastrointestinal tract and drugs used to treat common gastrointestinal problems are discussed. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy.

PHR 924 BASIC PRINCIPLES OF PHARMACEUTICAL SCIENCE: DRUG FORM DESIGN. (3) This is the second course in a three semester sequence dealing with the principles of medicinal chemistry and pharmaceutics. The application of chemical kinetics to drug stability and the application of physical-chemical principles to the formulation of pharmaceutical solutions and solids are discussed. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy and PHR 914.

PHR 926 NONPRESCRIPTION PHARMACEUTICALS AND SUPPLIES II. (2) A continuation of PHR 916. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy and PHR 916.

PHR 929 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE II. (4) A continuation of PHR 919 completing skill development in resolving simple patient/ drug problems and including year one comprehensive skill assessment. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development. Coreq: Required PHR 92X series courses.

*PHR 931 PHARMACOLOGICAL BASIS FOR THERAPEUTICS: NERVOUS SYSTEM. (5) A study of human disease processes and rational pharmacotherapeutics relating to the autonomic, central and peripheral nervous system including a discussion of the factors influencing the development of substance dependence and the strategies for risk reduction. Emphasis is placed on the principles of pathophysiology, pharmacology, toxicology and therapeutics, the incorporation of these principles in the clinical application of modern drug therapy, and how these principles can be utilized in pharmacy practice. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the second year, College of Pharmacy.

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KEY: # = new course * = course changed † = course dropped ¶ = course removed from Bulletin due to inactivity
PHR 932 PHARMACOLOGICAL BASIS FOR THERAPEUTICS: IMMUNOLOGY AND BIOTECHNOLOGY. (3)
A study of the immune system, immunopathologies and select autoimmune diseases and their treatment. Includes a discussion of immunizations, immunology of cancer, neoplasias and an introduction to antineoplastic therapy. The course concludes with a discussion of biotechnology and its application to the production and use of pharmaceuticals, diagnostic agents and advanced therapies. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the second year, College of Pharmacy.

PHR 933 PHARMACOLOGICAL BASIS FOR THERAPEUTICS: ENDOCRINE SYSTEMS. (5)
A study of the pathophysiology of the major disorders affecting the endocrine system concentrating on the pharmacology of the therapeutic agents used to treat those disorders, including discussions of the rational use of endocrine agents and their congenerers in the treatment of non-endocrine diseases. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the second year, College of Pharmacy.

†PHR 937 INTRODUCTION TO PHARMACOKINETICS.

PHR 939 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE III. (6)
A continuation of PHR 929 concentrating on initial skill development in resolving moderately complex patient/drug related problems. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development. Coreq: Required PHR 93X series courses.

PHR 941 PHARMACOLOGICAL BASIS FOR THERAPEUTICS: CARDIOPULMONARY AND RENAL SYSTEMS. (5)
A study of the pathophysiology of the major disorders affecting the cardiovascular, renal and respiratory system concentrating on the pharmacology of the therapeutic agents used to treat those disorders. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the second year, College of Pharmacy and PHR 931.

PHR 944 BASIC PRINCIPLES OF PHARMACEUTICAL SCIENCE: NEW AND NOVEL DOSAGE FORMS. (3)
The last course in a medicinal chemistry and pharmacuetices sequence consisting of a discussion of in vivo testing to establish the bioequivalence of drug products, the application of physical-chemical principles to the formulation of pharmaceutical dispense systems, and a survey of modern drug delivery systems with a review of the scientific principles upon which the processes are based. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the second year, College of Pharmacy.

PHR 947 APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS. (4)
The theoretical and practical considerations of the processes of drug absorption (including dosage formulation), distribution, metabolism and excretion and the mathematical models that describe these events including the calculation of dosage regimens for patients with problems ranging from simple to complex. A variable mixture of compute-assisted learning, formal lecture, interactive lecture and problem-based learning laboratory experiences. Prereq: Admission to the second year, College of Pharmacy and PHR 937.

PHR 948 INTRODUCTORY PHARMACY PRACTICE CLERKSHIP. (4)
An introductory experience in the clinical use of drugs in the diagnosis, treatment and management of diseases. Experiences may involve on call and evening/weekend responsibilities. Offered on a pass/fail basis only. Laboratory, 40 or more hours per week. Prereq: Successful completion of required courses in the 930 series and consent of instructor.

PHR 949 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE IV. (5)
A continuation of PHR 939 completing skill development in resolving moderately complex patient/drug related problems and including a year two comprehensive skill assessment. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development. Coreq: Required PHR 94X series courses.

PHR 951 INTEGRATED THERAPEUTICS I. (7)
Integrated advanced application of pharmaceutical sciences to patient care following an organism/disease state approach and emphasizing the development and implementation of patient-specific pharmacotherapeutic treatment plans. Therapeutic areas are integrated with corresponding applied pharmacokinetic (e.g. cardiovascular pharmacotherapy with pharmacokinetics of digitalis glycosides and antiarrhythmics). Basic science considerations (usually in pharmacology, biochemistry or pharmacometrics) are incorporated within each area to reinforce basic principles and their importance in drug therapy. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the third year, College of Pharmacy; coreq: PHR 952.

PHR 952 DISEASE PROCESSES I. (3)
A comprehensive study of disease following an organism system approach and emphasizing the etiology, pathogenesis and clinical significance of disease processes with a special emphasis on disease processes that are amenable to drug treatment, influence drug disposition and/or are a result of complications of drug therapy. Variable mixture of lecture, group discussion, independent study and autopsy laboratory. Prereq: Admission to the third year, College of Pharmacy.

PHR 959 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE V. (7)
A continuation of PHR 949 concentrating on initial skill development in resolving very complex patient/drug related problems. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development with primary emphasis on problem based learning and further independent learning skill development. Coreq: Required PHR 95X series courses.

PHR 961 INTEGRATED THERAPEUTICS II. (7)
A continuation of PHR 951 Integrated Therapeutics I. Variable mixture of lecture, independent study and group discussion. Prereq: Admission to the third year, College of Pharmacy, PHR 951 and PHR 952; coreq: PHR 962.

PHR 962 DISEASE PROCESSES II. (3)
A continuation of PHR 952 Advanced Pharmacology I. Variable mixture of lecture, group discussion, independent study and autopsy sessions. Prereq: Admission to the third year, College of Pharmacy and PHR 952.

PHR 969 CONTEMPORARY ASPECTS OF PHARMACY PRACTICE VI. (7)
A continuation of PHR 959 concentrating on skill development in resolving very complex patient/drug related problems and including a year three comprehensive skill assessment. Variable mixture of lecture, seminar, group discussion, individual study, laboratory exercises, public service projects and portfolio development with primary emphasis on problem based learning and independent learning skill development. Coreq: Required PHR 96X series courses.

PHR 988 PHARMACY PRACTICE CLERKSHIP. (4)
A clinical experience in the use of drugs in the diagnosis, treatment and management of diseases. Emphasis is placed on a rationale of drug therapy, the provision of contemporary pharmaceutical care services and functioning as a member of an interdisciplinary health care team. Experiences will be obtained in a variety of areas and may involve on call and evening/weekend responsibilities. May be repeated to a maximum of 44 credits. Laboratory, 40 or more hours per week. Prereq: Admission to the fourth year, College of Pharmacy and permission of instructor.

PHR 997 ADVANCED CLINICAL PHARMACOKINETICS AND PHARMACODYNAMICS. (2)
Advanced topics in clinical pharmacokinetics and dynamics theory and practice. Designed for students interested in careers in clinical pharmacokinetics, service, research, industry or education. Variable mixture of lecture, group discussion and independent study. Prereq: Admission to the first year, College of Pharmacy and PHR 947.

PHR 998 PHARMACY PRACTICE CLERKSHIP: MENTORING. (4)
A continuation of PHR 988 but with the additional responsibilities of serving, with the preceptor, as part of a team mentoring students in introductory clerkship experiences and learning the introductory principles of serving as a preceptor. May be repeated to a maximum of eight credits. Laboratory, 40 or more hours per week. Prereq: Successful completion of 24 credits of PHR 988 and permission of instructor.
PHY 105 PHYSICS AND ASTRONOMY TODAY. (1)
This course is intended for freshmen and others who wish to find out what physics is and how it relates to other fields of study. It is especially useful for physics majors or for those considering physics as a major or minor. One demonstration lecture per week presented by various members of the physics faculty. May only be taken on a pass/fail basis.

PHY 130 PHYSICS OF ENERGY. (3)
Energy sources, such as fossil fuels; nuclear, solar and hydro electric power are discussed in the context of the basic laws of physics which govern their uses and limitations. Concepts covered include kinetic and potential energy, heat, radiation, and mass-energy equivalence. Credit is not given to students who already have credit for PHY 201, 211, or 231.

PHY 140 MUSIC ACOUSTICS. (3)
An introduction to certain physical laws governing sound, sources of sound and mediums through which sound travels. Included are acoustical explanations of how musical instruments produce sounds and their characteristic timbres. (Same as MUS 140.)

PHY 151 INTRODUCTION TO PHYSICS. (3)
A lecture demonstration course covering the mechanics of solids, liquids, gases, heat, and sound. Credit is not given to students who already have credit for PHY 201, 211, or 231. Prereq: Two years of high school algebra or MA 108R.

PHY 152 INTRODUCTION TO PHYSICS. (3)
A lecture demonstration course covering electricity, magnetism, optics, atomic and nuclear physics. Credit is not given to students who already have credit for PHY 203, 213 or 232. Prereq: Two years of high school algebra or MA 108R.

*PHY 153 LABORATORY FOR MIDDLE SCHOOL TEACHERS. (1)
Laboratory to accompany PHY 151-152 with experiments and exercises designed especially for students preparing to be middle school teachers. Laboratory, two hours per week. Prereq: PHY 151; coreq: PHY 152.

PHY 160 PHYSICS AND ASTRONOMY FOR ELEMENTARY TEACHERS. (3)
Course sequence (GLY 160-PHY 160 six credit hours) in physical science for prospective elementary teachers. The sequence addresses basic concepts of earth science, astronomy and physics appropriate for elementary teachers and is taught with an emphasis on inquiry-based, laboratory activities. PHY 160 includes the basics of the motion of objects, astronomy by sight, electrical circuits, magnetism and the behavior of light. Lecture, one hour; laboratory, five hours per week. Prereq: GLY 160.

PHY 201 GENERAL PHYSICS. (4)
Same as PHY 211, but without laboratory. Credit is not given to students who already have credit for PHY 211 or 231. Prereq: A working knowledge of algebra and basic trigonometry as obtainable, for example, in MA 109 and MA 112 or demonstrated by an ACT math score of at least 25.

PHY 203 GENERAL PHYSICS. (4)
Same as PHY 213, but without laboratory. Credit is not given to students who already have credit for PHY 213 or 232. Prereq: PHY 201.

#PHY 210 SPECIAL LABORATORY FOR GENERAL PHYSICS PHY 201. (1)
Special laboratory for students who have completed PHY 201 and later determine that they need an accompanying laboratory. Laboratory, two hours per week. Prereq: PHY 201.

PHY 211 GENERAL PHYSICS. (5)
A general course covering the mechanics of solids, liquids, and gases; heat; and sound. Lecture, two hours; recitation, two hours; laboratory, two hours. Credit is not given to students who already have credit for PHY 231 and 241. Prereq: A working knowledge of algebra and basic trigonometry as obtainable, for example, in MA 109 and MA 112 or demonstrated by an ACT math score of at least 25.

#PHY 212 SPECIAL LABORATORY FOR GENERAL PHYSICS PHY 203. (1)
Special laboratory for students who have completed PHY 203 and later determine that they need an accompanying laboratory. Laboratory, two hours per week. Prereq: PHY 203.

PHY 213 GENERAL PHYSICS. (5)
Continuation of PHY 211, covering electricity and magnetism, optics, and modern physics. Lecture, two hours; recitation, two hours; laboratory, two hours. Credit is not given to students who already have credit for 232 and 242. Prereq: PHY 211 or equivalent.

PHY 231 GENERAL UNIVERSITY PHYSICS. (4)
An advanced general course covering the mechanics of solids, liquids, and gases; heat; and sound. Lecture, three hours; recitation, one hour. Prereq or concur: MA 114.

PHY 232 GENERAL UNIVERSITY PHYSICS. (4)
An advanced general course covering electricity, magnetism, and optics. Lecture, three hours; recitation, one hour. Prereq or concur: MA 213.

PHY 241 GENERAL UNIVERSITY PHYSICS LABORATORY. (1)
An advanced general laboratory course with experiments on the mechanics of solids, liquids, and gases; and on heat and sound. Prereq or concur: PHY 231.

PHY 242 GENERAL UNIVERSITY PHYSICS LABORATORY. (1)
An advanced general laboratory course with experiments on electricity, magnetism, and light. This course is prerequisite to other courses in physics and related areas of study. Prereq: PHY 241; concur: PHY 232.

*PHY 308 PRINCIPLES OF OPTICS. (3)
A lecture and problems course covering the basic phenomena of geometrical and physical optics. Topics include matrix formulation of geometrical optics, solutions to the classical wave equation and Fourier analysis. Prereq: PHY 232; concur: MA 214 and PHY 242. With permission of Director of Undergraduate Studies, PHY 231 can be substituted for PHY 232 and PHY 242.

*PHY 361 PRINCIPLES OF MODERN PHYSICS. (3)
An introduction to the principles of special relativity, the foundations of quantum mechanics and selected topics in atomic, nuclear, particle, solid state, and statistical physics. Prereq: PHY 252 or, with permission of the Director of Undergraduate Studies, PHY 213, MA 213.

PHY 395 INDEPENDENT WORK IN PHYSICS. (1-3)
Students may select an approved topic for study under the direction of a faculty member. May be repeated to a maximum of 12 credits. Prereq: Major and a standing of 3.0 in the department.

PHY 401G SPECIAL TOPICS IN PHYSICS AND ASTRONOMY FOR ELEMENTARY AND HIGH SCHOOL TEACHERS. (2-4)
Selected topics in physics and astronomy of special interest to teachers will be discussed. When the course is offered, a specific title with specific credits, the number of hours in lecture-discussion and laboratory will be announced. Lecture/discussion, two-four hours; laboratory, zero-four hours. May be repeated to a maximum of eight credits. Prereq: Open only to elementary school and/or high school teachers; consent of instructor.

*PHY 402G ELECTRONIC INSTRUMENTATION AND MEASUREMENTS. (3)
Elementary treatment of electronic circuits emphasizing laboratory work. Topics include AC circuits, filters, theory and operation of transistors and other semiconductor devices and a simple treatment of operational amplifiers. Lecture, two hours per week; laboratory, three hours per week. Prereq: PHY 242 or EE 305 or consent of instructor. (Same as EE 402G.)

*PHY 404G MECHANICS. (3)
A lecture and problem course covering the fundamental laws of mechanics. Topics include Newton’s Laws, Kepler’s Laws, oscillatory motion and an introduction to Lagrangian methods. Prereq: PHY 232, or with permission of Director of Undergraduate Studies, PHY 213; concur: MA 214.

*PHY 416G ELECTRICITY AND MAGNETISM. (3)
First of two lecture and problem courses covering: the theory of electrostatic fields in the presence of conductors and dielectric materials, magnetic fields due to steady currents in the presence of magnetic materials, electromagnetic induction, and electromagnetic fields due to time-varying currents. Prereq: PHY 308, MA 214. MA 432G recommended.

*PHY 417G ELECTRICITY AND MAGNETISM. (3)
Second of two lecture and problem courses covering: the theory of electrostatic fields in the presence of conductors and dielectric materials, magnetic fields due to steady currents in the presence of magnetic materials, electromagnetic induction, and electromagnetic fields due to time-varying currents. Prereq: PHY 416G.

PHY 422 COMPUTATIONAL PHYSICS LABORATORY. (3)
An introductory laboratory and lecture course covering the application of numerical methods to the solution of problems encountered in mechanics and electrostatics. Lecture, one hour; laboratory, four hours per week. Prereq: PHY 404G or equivalent.
PHY 472G INTERACTION OF RADIATION WITH MATTER. (3)
Basic aspects of the interaction of ionizing radiation with matter. Bohr atom, atomic
spectra, radioactivity, energetics of decay. Sources of radiation, penetration of charged
particles, electromagnetic radiation, and neutrons through matter; excitation and
ionization processes; selected nuclear reactions; basic radiation detection and dosimetry.
Prereq: PHY 213 or 232; MA 114 (may be taken concurrently); or equivalent. (Same as RM 472G.)

PHY 477 PHYSICS AND ASTRONOMY SEMINAR. (1)
Reports and discussion on student research projects and research topics from the literature
of physics and astronomy. May be repeated to a maximum of two credits. Prereq: PHY
361, COM 199 or equivalent.

PHY 504 ADVANCED MECHANICS. (3)
A continuation and extension of PHY 404G. Includes dynamics of a particle, rigid bodies,

PHY 506 METHODS OF THEORETICAL PHYSICS I. (3)
The course and its sequel (MA/PHY 507) are designed to develop, for first-year graduate
students, familiarity with the mathematical tools useful in physics. Topics include
curvilinear coordinates, infinite series, integrating and solving differential equations of
physics, and methods of complex variables. Work with Green's functions, eigenvalues,
matrixes and the calculus of variations are included as a part of MA/PHY 506 and 507.
Prereq: PHY 404G or equivalent. (Same as MA 506.)

PHY 507 METHODS OF THEORETICAL PHYSICS II. (3)
Continuation of MA/PHY 506. Fourier and Laplace Transforms, the special functions
(Bessel, Elliptic, Gamma, etc.) are described. Work with Green's functions, eigenval-
ues, matrices and the calculus of variations are included as a part of MA/PHY 506 and 507.
Prereq: MA/PHY 506. (Same as MA 507.)

PHY 508 OPTICS. (3)

*PHY 520 INTRODUCTION TO QUANTUM MECHANICS. (3)
A lecture and problem course providing an introduction to the concepts and formalism
of quantum mechanics. Primary emphasis is on the Schrodinger equation and its
applications including the simple harmonic oscillator, the square well, the hydrogen
atom, orbital and spin angular momenta, matrix representation of two level systems.
Prereq: PHY 361, MA 214; recommended: MA 322.

PHY 522 HEAT AND THERMODYNAMICS. (3)
A lecture and problem course stressing some of the fundamental principles of heat
phenomena, the laws of thermodynamics, equations of state for ideal and real gases,
continuity, derivation of thermodynamic relations. Prereq: PHY 361 and MA 214.

*PHY 524 SOLID STATE PHYSICS. (3)
Introductory solid state physics with emphasis on the properties of electrons in crystals;
crystal structure, crystal diffraction, reciprocal lattice, lattice vibrations and phonons,
free electron theory, energy bands in solids, semiconductors. Prereq: PHY 520 or consent
of instructor. (Same as EE 524.)

PHY 525 SOLID STATE PHYSICS. (3)
PHY 525 is a continuation of PHY 524. Crystal binding; elastic constants and elastic
waves; superconductivity; ferromagnetism; optical and transport properties of metals,
semiconductors, insulators, and interfaces. Prereq: PHY 524.

PHY 530 EXPERIMENTAL PHYSICS: OPTICS AND SPECTROSCOPY. (2)
An advanced laboratory dealing with the wave nature of light, optical systems,
interference, diffraction, polarization and spectroscopy. Prereq: PHY 508 or PHY 508.

PHY 535 EXPERIMENTAL PHYSICS: ATOMIC AND NUCLEAR. (3)
A combined lecture and laboratory course in which students both learn the statistical
methods by which observational data are analyzed and repeat many of the experiments
which established the quantum-mechanical behavior of atomic and nuclear systems.
Experiments include the quantization of charge, the energy levels of atomic systems,
the wave nature of matter, Compton scattering from electrons, X-ray diffraction, Planck
constant. Lecture, one hour; laboratory, four hours per week. Prereq: PHY 361.

PHY 540 RADIATION HAZARDS AND PROTECTION. (3)
An analysis of common radiation hazards encountered in medicine, research, industry,
and the environment. Regulations and procedures for the safe use of ionizing and
nonionizing radiations. Lecture, two hours; laboratory, two and one-half hours. Prereq:
PHY/RM 472G or consent of instructor. (Same as RM/RAS 545.)

PHY 546 GENERAL MEDICAL RADIOLOGICAL PHYSICS. (3)
The uses and dosimetric aspects of radiation in medicine will be analyzed, including
many basic applications in the fields of diagnostic radiology physics, therapy physics,
and nuclear medical physics. Prereq or concur: RM/PHY 472G or consent of instructor.
(Same as RM/RAS 546.)

*PHY 554 FUNDAMENTALS OF ATOMIC PHYSICS. (3)
A continuation of introductory quantum mechanics with application to atomic systems.
Topics include angular momentum, perturbation theory, variational principles,
interaction of radiation with matter, atomic spectra and the Zeeman and Stark effects.
Prereq: PHY 520.

PHY 555 FUNDAMENTAL NUCLEAR PHYSICS. (3)
Topics covered include nuclear systematics, the nucleon-nucleon-interaction, nuclear
models, radioactivity, nuclear reactions, fission and fusion. Prereq: PHY 520.

PHY 556 FUNDAMENTAL PARTICLE PHYSICS. (3)
Introduction to elementary particle physics. Topics include: particle interactions and
families, the quark model, symmetrics and conservation laws, particle reactions and
decays, quark dynamics, and elements of quantumchromodynamics and electroweak
interactions. Prereq: PHY 520.

PHY 567 INTRODUCTION TO LASERS AND MASERS. (3)
Basic principles of laser action, atomic transitions; population inversion; two-and three-
level systems; optical resonators; pumping methods; applications. Prereq: Engineering
upper division status or consent of instructor. (Same as EE 567.)

PHY 570 SEMINAR ON TEACHING PHYSICS. (1)
A seminar course for teaching assistants focused on developing the art and science of
teaching physics. Journal articles, books and other texts will be studied to serve as sources
of discussion about the teaching and learning activities in the Department of Physics and Astronomy.
Prereq: Consent of instructor.

PHY 571 SEMINAR ON TEACHING PHYSICS LABORATORIES. (1)
A seminar course for teaching assistants focused on developing the art and science of
teaching physics laboratories. Journal articles, books and other texts will be studied to serve as sources of discussion about the teaching and learning activities in the laboratory classes in the Department of Physics and Astronomy.
Prereq: Consent of instructor.

PHY 591 ASTROPHYSICS I - STARS. (3)
Structure of the universe - an overview: hierarchy of objects, the distance ladder. Stellar
structure: hydrostatic equilibrium, energy transport, nuclear energy generation, equilib-
rium solutions. Stellar evolution: nucleosynthesis, evolution off the main sequence,
final stages of stellar life - white dwarfs, supernovae, neutron stars and black holes. Binary
stellar systems. Prereq: PHY 361, PHY 416G, PHY 417G. (Same as AST 591.)

PHY 592 ASTROPHYSICS II - THE GALAXY. (3)
Interstellar matter: gas and dust, interstellar reddening, absorption lines, 21 cm
observations. Phases of the interstellar medium: HII regions, atomic and molecular
clouds. Star formation. Star populations. Galactic structure and dynamics: the galactic
center, spiral structure, rotation curve, dark matter. Prereq: PHY 591. (Same as AST 592.)

PHY 600 SELECTED TOPICS IN ADVANCED PHYSICS. (2-3)
Topics of an advanced and specialized nature such as the theory of angular momentum,
topics in advanced theoretical nuclear physics, topics in advanced statistical mechanics.
May be repeated to a maximum of nine hours. Prereq: Consent of instructor.

PHY 611 ELECTROMAGNETIC THEORY I. (3)
A lecture and problem course treating electrodynamics, boundary conditions, potential
problems, energy in electric and magnetic fields, magnetic materials and Maxwell's
equations. Prereq: PHY 416G; MA 214.

PHY 613 ELECTROMAGNETIC THEORY II. (3)
Continuation and extension of PHY 611. Includes theory of electromagnetic waves and
applications to optical phenomena and radiation. Special theory of relativity and the
covariant treatment of Maxwell's equations will be discussed. Prereq: PHY 611.

PHY 614 QUANTUM MECHANICS I. (3)
A lecture and problem course dealing with the description of quantum systems in the
forms of wave mechanics, matrix mechanics and state vectors. Also includes angular
momentum and its addition, and approximation methods for bound states. Prereq: PHY
520.

PHY 615 QUANTUM MECHANICS II. (3)
Continuation of PHY 614 covering time dependent perturbation theory, symmetry
and invariance principles, and elementary scattering theory including the method of partial
waves. Prereq: PHY 614.
### PLS 651 Atomic Physics

A lecture and problem course dealing with advanced topics in atomic physics, including atomic structure, spectra, and interactions of atoms with charged particles and electromagnetic fields. Topics include Rydberg atoms, ionization processes, electron correlations, laser techniques and general theoretical methods. Prereq: PHY 554, 611 and 614.

### PLS 716 Advanced Quantum Mechanics

A continuation of PHY 615. Topics covered will include the relativistic wave equations, second quantization, quantum electrodynamics. Prereq: PHY 615.

### PLS 748 Master's Thesis Research

Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

### PLS 749 Dissertation Research

Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

### PLS 756 Particle Physics

A lecture-problem course on advanced topics in elementary particle physics. Topics include the quark model and group theory, chiral symmetry of the strong interaction, the parton model and scaling, quantum chromodynamics, electroweak theory, grand unification, and the renormalization group. Prereq: PHY 716.

### PLS 768 Residence Credit for the Master's Degree

May be repeated to a maximum of 12 hours.

### PLS 769 Residence Credit for the Doctor's Degree

May be repeated indefinitely.

### PLS 770 Colloquium

A weekly meeting of the staff and advanced students for the discussion of recent developments in physics and of work in progress in the department. Credit is given to those who satisfactorily present papers. May be repeated to a maximum of eight credits.

### PLS 801 Independent Work in Physics

May be repeated to a maximum of 12 credits.

### PLS 802 Research in Physics

May be repeated to a maximum of six credits.

### PLS 803 Research in Physics

May be repeated to a maximum of 10 credits.

### PLS 100 An Introduction to Horticulture Professions

A survey of horticulture as a profession; to inform students of opportunities and to develop an appreciation of horticultural science as it relates to the human environment. Offered on a pass/fail basis only.

### PLS 104 Plants, Soils, and People: A Global Perspective

A survey of important world grain, oil, fiber, forage, fruit, vegetable and specialty crop plants. Principles of plant, soil and climatic factors governing adaptation and production of these plants are discussed and applied. Intended to provide substantial plant and soil science background for students not majoring in plant and soil science, but is open and should appeal to beginning plant and soil science majors as well.

### PLS 203 Home Horticulture

A general horticulture course encompassing the use of ornamental plants, vegetable and fruit crops, and landscape design for the nonhorticulture major. (May not be used to fulfill horticulture departmental requirements.)

### PLS 210 The Life Processes of Plants

This course is intended to provide a basic understanding of the natural products and processes that shape the nature of modern plants, and govern their interactions with the environment and characteristics unique to plants, and develop a basic understanding of how these plant attributes relate to organismic function. Emphasis will be placed on exploring the nature of the major plant biomes of the Earth, their community dynamics, and how member plants compete for space and other resources. Development of optimal plant strategies for reproductive success, plant interaction with other living systems as well as abiotic factors and their defense from predation and attack will also be considered. (Same as BIO 210.)

### PLS 220 Introduction to Plant Identification

An introduction to the techniques used for plant identification based on over one hundred plants encountered in everyday life. Lecture, one hour; laboratory, four hours per week.

### PLS 300 Woody Horticultural Plants

A detailed study of evergreen and deciduous trees, shrubs, vines, and ground covers occurring in the landscape; their systematic identification, hardness, form, growth habit, size, culture, adaptation to environmental conditions, uses, and outstanding horticultural characteristics. Lecture, three hours; laboratory, three hours. Prereq: PLS 220.

### PLS 303 Herbaceous Horticultural Plants I

The identification and cultural requirements of herbaceous plants. A designated number of annuals, perennials, commercial cut flowers, flowering pot plants, bulbs, and foliage plants readily available in the fall will be covered. Lecture, three hours; laboratory, two hours per week for one half semester. Prereq: PLS 220.

### PLS 304 Herbaceous Horticultural Plants II

The identification and cultural requirements of herbaceous plants. A designated number of annuals, perennials, commercial cut flowers, flowering pot plants, bulbs, and foliage plants readily available in the spring will be covered. Lecture, three hours; laboratory, two hours per week for one half semester. Prereq: PLS 220.

### PLS 340 Floral Design

Design work related to the florist industry. Lecture, two hours; laboratory, two hours per week. Prereq: Junior or Senior standing.

### PLS 352 Nursery Production

An introduction to the production practices of container and field grown nursery stock as they relate to management and operation of a nursery business. A two to three-day field trip is required. Two hours lecture per week; three hours laboratory per week. Prereq or concur: HOR 327 and PLS 465, both of which can be taken concurrently or consent of instructor.

### PLS 366 Fundamentals of Soil Science

Development of concepts and understanding of the properties and processes that are basic to the use and management of soils. Prereq: CHE 105, or consent of instructor.
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**PLS 367 SOIL AND WATER ANALYSIS LABORATORY.** (3)
Introductory laboratory emphasizing fundamental principles in soil science and water quality. Will provide hands-on experience in soil-water research and the written communication of acquired knowledge. Lecture 1.5 hours, laboratory three hours per week. Prereq: PLS 366 or approval of instructor.

**PLS 386 PLANT PRODUCTION SYSTEMS.** (4)
In-depth analysis of the underlying principles of plant production systems. Successful strategies, based on application of the principles developed by lecture and laboratory activities, will be discussed in either agronomic or horticultural contexts. Special attention will be given to minimizing the environmental impact of the plant production techniques employed. Prereq: PLS 366 or consent of instructor.

**PLS 395 SPECIAL PROBLEMS IN AGRONOMY.** (1-4)
May be repeated for a maximum of nine credits. Prereq: Consent of appropriate instructor before registration.

**PLS 399 EXPERIENTIAL LEARNING IN PLANT AND SOIL SCIENCE.** (1-6)
A field-based learning experience in agronomy under the supervision of a faculty member. May be repeated for a maximum of six credits.

**PLS 402 FRUIT CROP PRODUCTION.** (3)
A detailed study of the principles of the care and management of commercial plantings of deciduous fruits (both small and tree). Lecture, two hours; laboratory, two hours per week. Prereq: A course in botany.

**PLS 404 INTEGRATED WEED MANAGEMENT.** (4)
A study of weed management concepts based on the integration of weed biology and ecology data with cultural, biological, and herbicidal control. Lecture, three hours; laboratory, two hours. Prereq: PLS 386.

**PLS 408 TOBACCO.** (3)
History, botany, pathology, entomology, breeding, and culture of tobacco with special emphasis on burley. Prereq: PLS 386 or consent of instructor.

**PLS 410 GROWTH AND DEVELOPMENT OF HORTICULTURE CROPS.** (3)
A study of the physiological basis of growth and development of horticultural crops, with an emphasis on topics specific to horticultural crop management. Lecture, two hours; laboratory, two hours per week. Prereq: PLS 210, CHE 107.

**PLS 412 GRAIN CROPS.** (3)
Study of the grain crops of the world with respect to adaptation, production, management and use. Prereq: PLS 386 or consent of instructor.

**PLS 440 PLANT PROPAGATION.** (3)
A study of the principles and practices involved in producing plants by sexual and asexual methods and to provide the basic skills necessary for using these methods. The interrelationship of plant growth, structure and the environment as they affect the ability to propagate plants by a specific method. Lecture, two hours; laboratory, three hours per week. Prereq: PLS 210 and PLS 410.

**PLS 444 EXPERIMENTAL HIGHER PLANT BIOLOGY.** (4)
This course, offered jointly between the Department of Agronomy and the T.H. Morgan School of Biological Sciences, is intended to convey fundamental insights into how higher plants as experimental systems have provided a sound understanding of important areas of current biological and biochemical thought. A laboratory component is included to supplement the lecture materials. Lecture, three hours; lab, two hours per week. Prereq: BIO 210/PLS 210 or equivalent. (Same as BIO 444.)

**PLS 450G BIOGEOCHEMISTRY.** (3)
A course emphasizing the physical, chemical, and biochemical make-up of soil/water systems and the information required to predict chemical fate in the environment. Emphasis is placed on the relationships describing mineral solubility, sorption and exchange reactions, redox reactions, volatility, and biochemical cycling. Prereq: CHE 105, 107, 115; two semesters of college biology. (Same as NRC 450G.)

**PLS 451 LANDSCAPE MAINTENANCE.** (3)
Discussion of the protection, pruning, repair, and culture of plant material in landscape plantings as well as the diagnosis of plant-related problems and the management principles of landscape maintenance. Lecture, two hours; laboratory, three hours per week. Prereq: HOR 329, PPA 400G, ENT 320.

**PLS 455G WETLAND DELINEATION.** (3)
Basic concepts of natural wetland ecosystems, their importance, functions, and major features used for their identification and classification. Application of basic hydrology, hydrophytic vegetation and hydric soil indicators for identification of jurisdictional wetlands utilizing documentation and analysis of field collected data. Three laboratory exercises and four short field trips required. Prereq: PLS 366 or consent of instructor. (Same as NRC 455G.)

**PLS 456G CONSTRUCTED WETLANDS.** (3)
Important aspects of the functions of natural and constructed wetlands as water purifiers. Principles and mechanisms of the purification process, design, construction, operation and management criteria for efficient usage. Case studies and design problems of constructed wetlands on mining, agricultural, industrial and municipal wastewater treatment applications. Two all day field trips are required. Prereq: PLS 366 or consent of instructor. (Same as NRC 456G.)

**PLS 465 GREENHOUSES AND CONTROLLED ENVIRONMENTS.** (3)
A study of greenhouse structures, coverings, equipment, and the monitoring and regulation of the environment including temperature, light, carbon dioxide, and relative humidity as these factors relate to the commercial production of greenhouse crops. Other types of controlled environments are also included. Lecture, two hours; laboratory, two hours per week. Prereq: PLS 386 and PLS 410 or concurrently.

**PLS 468G SOIL USE AND MANAGEMENT.** (3)
The application of principles related to soils and their management in planning the utilization of land and associated resources. Lecture and discussion. Prereq: PLS 366 or consent of instructor.

**PLS 470G FERTILIZERS AND SOIL FERTILITY.** (3)
Sources and manufacture of fertilizer materials; soil reaction of elements essential for plant growth; effective use of fertilizers for various soil situations. Prereq: PLS 366 and PLS 386 or consent of instructor.

**PLS 475 SEMINAR IN HORTICULTURE.** (1)
An integration of the student’s skills in communication and horticulture. Emphasis will be on oral presentations in a horticulture topic of interest to the student. Six lectures with additional presentations by faculty and guests of the department. Prereq: Senior status.

**PLS 477G LAND TREATMENT OF WASTE.** (3)
Resource management with emphasis on principles and methods of soil application of wastes (agricultural, industrial, and municipal). Topics include chemical and biological systems; soil and plant management; development, monitoring, and record keeping. Prereq: PLS 366. (Same as NRC 477G.)

**PLS 490 TOPICS IN PLANT AND SOIL SCIENCE.** (3)
A capstone course for majors in Plant and Soil Science to be taken near the conclusion of the student’s academic career. The course provides the student the opportunity to integrate knowledge acquired in previous courses in the plant and soil science and support areas. Emphasis will be placed on problem solving, synthesizing and integrating information, critical thinking, group activities, and written and oral communication. Instructional methods may include formal lectures, laboratories or supervised individual research. The specific nature of the course depends upon the student’s Area of Emphasis. Prereq: Senior in Plant and Soil Science.

**PLS 501 RECLAMATION OF DISTURBED LAND.** (3)
Development of concepts, principles, and an understanding of the problems associated with restoring the productivity of soils disturbed by surface mining of coal as well as a limited discussion of reclamation of other types of disturbed soils. One all-day field trip is required. Prereq: PLS 366.

**PLS 502 ECOLOGY OF ECONOMIC PLANTS.** (3)
Study of the physical environment (radiation, temperature, precipitation, and evapotranspiration) in which crops are grown and the effect of the environment on crop growth and yield. Both micro- and macro-climatic relationships are considered.

**PLS 510 FORAGE MANAGEMENT AND UTILIZATION.** (4)
Critical study of grassland plants and the biological and physical factors operative in utilization of natural and cultivated grasslands by domestic animals. Lecture, three hours; laboratory, two hours. Prereq: PLS 366, or consent of instructor.

**PLS 515 TURF MANAGEMENT.** (3)
A study of the selection, culture, and management of certain turf species used for home lawns, golf courses, athletic fields, and highway slopes. Lecture, two hours; laboratory, two hours. Prereq: BIO 106 and PLS 366.
*PLS 520 VEGETABLE CROP MANAGEMENT. (3)
A study of the fundamental principles underlying management of vegetable crops produced in the field and in the greenhouse. Lecture, two hours; laboratory, two hours. Prereq: PLS 386 and PLS 410.

*PLS 525 GREENHOUSE FLORAL CROP MANAGEMENT. (3)
The study of methods of control of flowering and growth of selected flowering pot plants, cut flowers and bedding plants produced commercially in greenhouses. Lecture, two hours; laboratory, two hours. Prereq: PLS 386, PLS 450, PLS 46 or concurrently.

*PLS 556 SEED TECHNOLOGY. (3)
Changes occurring during reproductive development, seed germination and seed deterioration; principles of seed production for forage and grain crops; technical aspects of conditioning, testing, storage and marketing of genetically pure crop seed. Lecture, two hours; laboratory, four hours for 12 weeks. Prereq: PLS 386 or consent of instructor.

*PLS 560 SOIL-PLANT RELATIONSHIPS. (3)
The soil-plant system with emphasis on the soil as an environment for plant roots; nutrient requirements of plants; and nutrient behavior in soils. Prereq: PLS 470G or equivalent, or consent of instructor.

*PLS 564 FOREST SOILS. (3)
The physical, chemical and biological properties of soils as they relate to forest tree growth and the forest community. A study of the genesis, morphology, classification and utilization of soils for forestry. Three class hours per week with occasional extended field trips. Prereq: PLS 366 and PLS 367 and consent of instructor. (Same as FOR 564.)

*PLS 566 SOIL MICROBIOLOGY. (3)
The nature and biochemical activities of soil microflora; their significance in soil genesis and structure and their role in soil fertility. Prereq: PLS 366 or an introductory microbiology course or consent of instructor.

*PLS 567 METHODS IN SOIL MICROBIOLOGY. (1)
Methods in Soil Microbiology will be a laboratory course dedicated to introducing upper division students to the methods and techniques used by microbiologists and other soil scientists to examine organisms, interactions, and processes in soil systems. Laboratory, three hours per week. Prereq: PLS 366 or introductory microbiology course.

*PLS 573 SOIL MORPHOLOGY AND CLASSIFICATION. (3)
Study of concepts of soil horizons, soil profiles and soilscape; morphological, physical, chemical and mineralogical parameters useful in their characterization. Soil forming factors and processes. Basic principles of soil classification. Characterization of selected Kentucky soils and their placement in the modern system; practical field problems in soil identification, characterization and classification. Lecture, two hours; laboratory, three hours per week. Prereq: PLS 366 and PLS 367 or consent of instructor.

*PLS 575 SOIL PHYSICS. (2)
Physical properties of soils and their relationship to chemical, mineralogical, and biological soil properties and to plant growth. Prereq: PLS 366 and PLS 367 and consent of instructor.

*PLS 576 LABORATORY IN SOIL PHYSICS. (1)
Laboratory experiences for the purpose of increasing an understanding of the principles of soil physical measurements and their relationships to chemical, mineralogical and biological soil properties. Laboratory, two hours. Prereq: PLS 575 or concurrent.

*PLS 581 CHEMICAL ANALYSIS OF SOILS AND PLANTS. (4)
Laboratory emphasis on instrumental methods and techniques used in quantitative and qualitative chemical analysis of soil and plant materials and relation of these analyses to physical, chemical and biological systems. Lecture, one hour; discussion, one hour; laboratory, four hours. Prereq: PLS 366 or equivalent, or consent of instructor.

*PLS 582 SPECIAL PROBLEMS IN HORTICULTURE. (1-4)
May be repeated to a maximum of nine credits. Prereq: Consent of instructor.

*PLS 597 SPECIAL TOPICS IN PLANT AND SOIL SCIENCE (Subtitle required). (1-3)
Special topical or experimental courses in crop science, soil science or related areas of horticulture, or plant physiology for graduate and advanced undergraduate students. Special subtitle required and must be approved by the chair of Agronomy or Horticulture. A particular subtitle may be offered twice under PLS 597. Students may not repeat under the same subtitle. Prereq: Permission of instructor.

*PLS 598 SPECIAL PROBLEMS IN AGRONOMY. (1-4)
May be repeated for a maximum of nine credits. Prereq: Consent of instructor.

*PLS 601 SPECIAL TOPICS IN MOLECULAR AND CELLULAR GENETICS. (1)
Each semester five distinguished visitors visit the UK campus to deliver a series of three formal lectures each and participate in numerous informal contacts with graduate students. The emphasis is on the presentation of the most current advances (often unpublished) in selected topics in molecular and cellular genetics. May be repeated to a maximum of six credits. (Same as BCH/BIO/MI/PFA 601.)

*PLS 602 PRINCIPLES OF YIELD PHYSIOLOGY. (3)
Critical study of the physiological factors and processes involved in determining economic yield in grain crops. The focus will be on factors operating at the whole plant and plant community level as opposed to physiological processes at the cellular or subcellular level. A logical, analytical description of the process of economic yield production by grain crops will be developed and related to historical changes in crop yields and the potential for increasing yields in the future. Prereq: PLS 386 and BIO 430G or consent of instructor.

*PLS 605 PHYSIOLOGICAL MECHANISMS IN HORTICULTURAL PLANTS. (3)
A critical evaluation of the recent concepts in certain selected areas of horticultural science. Prereq: BIO 530 or equivalent.

*PLS 619 CYTOGENETICS. (4)
Classical, biochemical and molecular studies of the structure and function of eukaryotic chromosomes. Emphasis is placed on the effects of variation in chromosome type, structure and number on Mendelian genetics and in plant and animal breeding. Lecture, three hours; laboratory, two hours. Prereq: ASC/ABT 360 or BIO 404G. (Same as BIO 619.)

*PLS 620 PLANT MOLECULAR BIOLOGY. (3)
This course is intended to be a treatment of current concepts of plant molecular biology. It will be a literature-based course, supplemented by handouts and reading lists. The course will deal as much as is possible with topics that are unique to plants. Current aspects of molecular biology that are relevant to the course content will be covered in the first part of the course; however, these lectures will not be a review of topics that should have been retained from introductory genetics and biochemistry courses. Also, they will not be a substitute for a molecular biology course. Prereq: One semester of undergraduate genetics and biochemistry or consent of instructor. (Same as BIO 620.)

*PLS 622 PHYSIOLOGY OF PLANTS I. (3)
A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant-cell biology, ion transport, water and translocation, respiration and photosynthesis. Prereq: BIO 430G or equivalent or consent of coordinator. Prereq or concur: BCH 501. (Same as BIO/FOR 622.)

*PLS 623 PHYSIOLOGY OF PLANTS II. (3)
A physiological/biochemical treatment of central topics in modern plant physiology. Topics will include: plant hormones, an introduction to plant biotechnology, senescence and abscission, stress physiology, phytochrome-photomorphogenesis-phototropism nitrogen and sulfur metabolism. Prereq: BIO 430G or equivalent, and BCH 501 or consent of course coordinator. (Same as BIO/FOR 623.)

*PLS 650 SOIL-PLANT RELATIONSHIPS. (3)
An advanced course on the relationships between media and the root systems of plants growing therein. Prereq: PLS 366, BIO 430G (or equivalent), or consent of instructor.

*PLS 657 SEED BIOLOGY. (3)
Structure, development and function during plant reproductive development and seed ontogeny, including fertilization, embryogenesis and endosperm development, seed formation, maturation, germination, dormancy and deterioration. Prereq: ABT 360, BIO 440G or consent of instructor.

*PLS 658 ADVANCED WEEED SCIENCE. (4)
Taxonomical, ecological, physiological, chemical and biochemical aspects of cultural and chemical weed control, and herbicide toxicity and selectivity. Prereq: PLS 404 or equivalent, one plant physiology course, one biochemistry course or consent of instructor.

*PLS 660 ADVANCED SOIL BIOLOGY. (2)
A critical evaluation of the current research status in selected aspects of soil biology. Prereq: PLS 566 or consent of instructor.

*PLS 664 PLANT BREEDING I. (3)
The application of advanced genetic principles to plant improvement. An in-depth study of existing plant breeding procedures and their applications and consideration of new techniques that can be applied to plant breeding and crop improvement. Prereq: STA 570 or consent of instructor; ASC 562 recommended.
**PLS 671 SOIL CHEMISTRY.**
A study of the chemical characteristics of the soil and of the more important chemical processes in the soil. Lecture and discussion, three hours; laboratory, two hours. Prereq: PLS 470G, 581; CHE 442G, or consent of instructor.

**PLS 676 QUANTITATIVE INHERITANCE IN PLANT POPULATIONS.**
After a brief review of population genetics theory, the course is divided into two sections which cover methods of estimating genetic variances and selection methods in population improvement. The course will focus on handling and interpretation of actual data sets through data analysis and discussion of current literature. Prereq: STA 570, STA 671, STA 672, and ASC 662. (Same as STA 676.)

**PLS 697 SPECIAL TOPICS IN AGRONOMY (Subtitle required).**
Special topical or experimental courses in crop science, soil science or related areas of agronomy for advanced graduate students. Special title required and must be approved by the chairperson of the Department of Agronomy. A particular title may be offered twice at most under PLS 697. Students may not repeat under the same title. May be repeated to a maximum of six hours. Prereq: Will be set by instructor.

**PLS 712 ADVANCED SOIL FERTILITY.**
An integration of the effects of soil, climate, species and management on the nutrition and dry matter accumulation of plants. Lecture, three hours; laboratory, two hours per week. Prereq. PLS 470G or PLS 560 or consent of instructor.

**PLS 721 PEDOGENIC PROCESSES.**
Soil forming factors and their interrelationships as related to development and distribution of soils. Processes of rock and mineral weathering with associated soil formation. Genesis and stability of soil clay minerals. Common methods used for pedological investigations. Basic principles and concepts of the present soil classification system and relationships between pedogenic processes and class criteria employed by soil taxonomy. Lecture, three hours; laboratory, two hours per week. Prereq. PLS 573 or consent of instructor.

**PLS 741 CLAY MINERALOGY.**
A comprehensive study of the crystal structures of clay minerals commonly found in soils and sediments. Lecture and discussion, three hours. Prereq. GYL 260 or consent of instructor. (Same as GYL 741.)

**PLS 748 MASTER'S THESIS RESEARCH.**
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq. All course work toward the degree must be completed.

**PLS 749 DISSERTATION RESEARCH.**
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq.: Registration for two full-time semesters of 769 residence credit following the successful completion of qualifying exams.

**PLS 768 RESIDENCE CREDIT FOR MASTER’S DEGREE.**
May be repeated to a maximum of 12 hours.

**PLS 769 RESIDENCE CREDIT FOR THE DOCTOR’S DEGREE.**
May be repeated indefinitely.

**PLS 770 HORTICULTURE SEMINAR.**
May be repeated to a maximum of three credits.

**PLS 772 PLANT AND SOIL SCIENCE SEMINAR.**
Reports and discussion of problems and research in crops, soils, horticultural science and plant physiology. May be repeated three times for a maximum of four credits.

**PLS 773 SEMINAR IN PLANT PHYSIOLOGY.**
Reports and discussions on various topics in plant physiology. May be repeated for a maximum of eight credits. (Same as BIO 773.)

**PLS 790 RESEARCH IN HORTICULTURE.**
May be repeated to a maximum of nine credits. Prereq. Consent of instructor.

**PLS 799 RESEARCH IN AGRONOMY.**
May be repeated for a maximum of 12 credits. Prereq.: Consent of instructor.

**PM 521 EPIDEMIOLOGY.**
Initial graduate level course in the principles of epidemiology and its uses and applications in preventive medicine and public health. Lecture, three hours; laboratory, two hours per week. Prereq.: Graduate students in Public Health and Nursing students in the Community Health Management component graduate program and consent of instructor.

**PM 601 ENVIRONMENTAL AND OCCUPATIONAL HEALTH.**
An overview of occupational and environmental health problems, toxicology related to the workplace and other environments, industrial hygiene, safety, and other topics relevant to environmental health. Lecture, three hours; laboratory, two hours per week. Prereq.: PHA 603 and PGY 502 or equivalents, or consent of instructor.

**PM 602 OCCUPATIONAL AND ENVIRONMENTAL HEALTH.**
A continuation of topics in PM 601. Lecture, three hours; laboratory, two hours per week. Prereq.: PM 601 or consent of instructor.

**PM 621 TOPICS IN ADVANCED EPIDEMIOLOGY.**
This course provides specialized epidemiologic content and method designed to meet the research and practice needs of health professionals. A series of topic-driven lectures and discussions will focus on the role of epidemiology in the prevention of disease and injury. Prereq.: PM 521 or permission of instructor.

**PM 651 WORK PLACE VENTILATION.**
This course will cover ventilation fundamentals for control of the work environment. Principles of airflow, fans, blowers, and basic hood design will be covered. Airflow measurements and ventilation will be discussed. Laboratory experience and field studies will be utilized as part of the teaching approach. Lecture, two hours; laboratory, two hours per week. Prereq.: PM 661 or consent of instructor.

**PM 661 INDUSTRIAL HYGIENE SAMPLING.**
This course, using lectures and laboratory exercises, will cover sampling and analysis techniques for industrial hygiene assessment and monitoring. The laboratory experiments are intended to simulate typical industrial hygiene measurement situations and to provide a basis for selection of sampling techniques and critical evaluation of laboratory results. Lecture, two hours; laboratory, two hours per week. Prereq.: Consent of the instructor.

**PM 662 PUBLIC HEALTH PRACTICE AND ADMINISTRATION.**
This course is to be a practical application of the principles of health care organization to public health at the national, state, and local levels. Prereq.: Health care organization course.

**PM 663 PRACTICUM IN ADVANCED INDUSTRIAL HYGIENE.**
A continuation of topics in PM 601. Lecture, three hours; laboratory, two hours per week. Prereq.: PM 662 or consent of instructor.

**PM 670 CLINICAL EPIDEMIOLOGY.**
The student will learn the fundamentals of designing clinical research studies of diagnostic tests, prognostics, and causation. Students will practice these skills through focused critiques of the medical literature and by designing clinical research studies. Prereq.: PM 521 or consent of instructor. STA 570 or equivalent is recommended.

**PM 675 RESEARCH DESIGN IN PUBLIC HEALTH.**
The techniques, strategies, and issues of conducting scientific investigations within the domain of public health and preventive medicine. Numerous theoretical and methodological approaches to public health problems will be addressed in a chronological manner that matches the sections of a peer-reviewed journal article, e.g., background, methods, results, and discussion. Prereq.: PM 521 and STA 570 and/or permission of instructor.
PM 676 WOMEN'S HEALTH: A PUBLIC HEALTH PERSPECTIVE. (3)
A seminar for analysis of women’s health issues using a global, public health approach incorporating theory, research, and health policy. Topics such as the epidemiology of the leading causes of morbidity and mortality among women, gender roles and health, reproductive health, women’s mental health, and women in the health care system will be examined. Students will select a topic from a wide range of women’s health issues for in-depth exploration. Prereq: Graduate or professional standing and consent of instructor. (Same as NUR 676.)

PM 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PM 768 RESIDENCY CREDIT FOR MASTER'S DEGREE. (1-6)
May be repeated to a maximum of six credits.

PM 770 SEMINAR IN PREVENTIVE MEDICINE AND PUBLIC HEALTH. (1-3)
A special seminar focusing each semester on an important topic, such as health problems of special working groups, cancer control, and health policy issues. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PM 780 SPECIAL PROBLEMS IN PREVENTIVE MEDICINE AND PUBLIC HEALTH. (1-3)
Organized study or tutorial focused on special problems or issues. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PM 790 RESEARCH IN PREVENTIVE MEDICINE AND PUBLIC HEALTH. (1-3)
Individually directed research under the supervision of one or more faculty members. Laboratory, two to six hours per week. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PM 815 FIRST-YEAR ELECTIVE, PREVENTIVE MEDICINE AND ENVIRONMENTAL HEALTH. (1-6)
The medical student working singly or in small groups will, with Preventive Medicine faculty assistance, identify a question in the broadest sense in “medicine” which can best be answered by a population-based study. This could include comparison of therapeutic techniques, status of knowledge by health provider or consumer about certain conditions or costs of care, problems of organizing health services, ethical problems, or any other population-based question amenable to study. Building on the second year experience, the project will involve identification of a question, design and conduct of research, appropriate analysis of data, and a written and oral presentation. Prereq: Admission to second-year medical curriculum and approval of adviser.

PM 825 SECOND-YEAR ELECTIVE, PREVENTIVE MEDICINE AND ENVIRONMENTAL HEALTH. (1-4)
With the advice and approval of his or her faculty adviser, the second-year student may choose approved electives offered by the Department of Preventive Medicine and Environmental Health. The intent is to provide the student an opportunity for exploration and study in an area which supplements and/or complements required course work in the second-year curriculum. Pass-fail only. Prereq: Admission to second-year medical curriculum and approval of adviser.

PPA 640 IDENTIFICATION OF PLANT DISEASES. (3)
An advanced study of plant pathogenic fungi with emphasis on diagnosis and identification of fungal plant diseases and inoculation and infection of plants. Lecture, two hours; laboratory, three hours. Prereq: PPA 640G or equivalent or consent of instructor.

PPA 652 PLANT PATHOGENIC FUNGI. (3)
An advanced study of plant pathogenic fungi with emphasis on diagnosis and identification of fungal plant diseases and inoculation and infection of plants. Lecture, two hours; laboratory, three hours. Prereq: PPA 640G or equivalent or consent of instructor.

PPA 800G PRINCIPLES OF PLANT PATHOLOGY. (3)
To present students with the principles of plant pathology. The causes, effects, control and nature of plant diseases will be studied; the laboratory will expose students to common diseases and pathogens discussed in lecture. Emphasis will be given to diseases important in Kentucky. Lecture, two hours; laboratory, two hours. Prereq: One semester of botany (e.g. BIO 351) and microbiology (e.g. BIO 108/109) or consent of instructor.

PPA 410 FOREST PATHOLOGY. (3)
Symptomatology, epidemiology, host-pathogen relations and control of selected diseases of forest trees. Lecture, two hours; laboratory, two hours. Prereq: BIO 106 and 107 or BIO 351 or one equivalent semester of botany. (Same as FOR 410.)

PPA 503 PLANT BIOCHEMISTRY. (3)
The chemical constituents of plants, their interaction and the regulation of their interaction in key plant metabolic systems will be studied. Included in the course will be discussions of photosynthesis, nitrogen, nitrate reduction, nitrogen assimilation, plant growth and its regulation and the structure and metabolism of constituents unique to plants. Prereq: BCH 501 and 502 or equivalent or consent of instructor. (Same as BCH 503.)

PPA 601 SPECIAL TOPICS IN MOLECULAR AND CELLULAR GENETICS. (1-3)
Each semester five distinguished scientists visit the UK campus to deliver a series of three formal lectures each and participate in numerous informal contacts with graduate students. The emphasis is on the presentation of the most current advances (often unpublished) in selected topics in molecular and cellular genetics. May be repeated to a maximum of six credits. (Same as BIO/BCH/MI/PLS 401-601.)

PPA 640 IDENTIFICATION OF PLANT DISEASES. (3)
Recognition and identification of plant diseases and their causes and development. The course is designed to give students practical experience in dealing with a wide array of plant diseases, symptom expressions, causal agents and interactions with environmental factors encountered in the difficult task of identifying plant diseases. May be repeated to a maximum of nine credits. Lecture, one hour; laboratory, six hours. Prereq: PPA 400G or equivalent or consent of instructor.

PPA Plant Pathology

PPA 652 PLANT PATHOGENIC FUNGI. (3)
An advanced study of plant pathogenic fungi with emphasis on diagnosis and identification of fungal plant diseases and inoculation and infection of plants. Lecture, two hours; laboratory, three hours. Prereq: PPA 640G or equivalent or consent of instructor.

PPA 656 PLANT VIROLOGY. (3)
Structure of viruses and viroids that cause plant diseases; replication and genome expression; biology of plant virus infections; ecology, epidemiology and control strategies for virus diseases. Prereq: PPA 400G and BCH 401G or consent of instructor.

PPA 660 MOLECULAR AND PHYSIOLOGICAL DYNAMICS OF PLANT-MICROBE INTERACTIONS. (4)
The course is intended to introduce the advanced student to the dynamic nature of plant-microbe interactions through diverse considerations of molecular genetic, physiological, biochemical and cytological aspects of plant diseases and symbioses. Prereq:AGR 360 or BIO 404G, BCH 401G, PPA 400G, or consent of instructor.

PPA 661 GENETICS OF PLANT-MICROBE INTERACTIONS. (3)
Genetics and molecular genetics of interactions between organisms. Primary emphasis will be plant interactions with fungi and bacteria. Areas of study will be: principles of interorganismal genetics and the gene-for-gene model; race-cultivar interactions; genetic determinants of disease in pathogenic relationships, and symbiosis in mutualistic relationships. Examples will include Flor’s flax/flax rust system, plant transformation by Agrobacterium, mutualisms involving Rhizobium, and others. Prereq: AGR 562 or equivalent, or consent of instructor.

PPA 695 EPIDEMIOLOGY AND MANAGEMENT OF PLANT DISEASES. (3)
An examination of plant disease development at the population level, and of how management practices influence dynamics of pathogen populations and disease development. The spectrum of disease management practices will be considered, including host plant resistance, cultural practices, chemical and biological control. Technical, social, and economic aspects of plant disease management will be discussed. Lecture, two hours; laboratory, two hours. Prereq: PPA 400G.

PPA 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.
PRO 740 PROSTHODONTICS ELECTIVE. (1-10)
Elective courses offered by the Department of Prosthodontics provide opportunities for further study of or experience in various aspects of prosthodontics. Topics may include treatment of patients who require complete dentures, removable partial dentures and overdentures; maxillofacial prosthodontics; and other prosthodontic treatment procedures. Hours variable, ranging from a minimum of 16 hours lecture/discussion to a maximum of 10 weeks clinical experience. May be repeated to a maximum of 10 credits. Prereq: The minimum year in dental school and any course prerequisites will be announced for each topic.

PS 101 AMERICAN GOVERNMENT. (3)
A survey of national government and the political process in the United States, with emphasis on the Constitution, the President, Congress, and the judicial system.

PS 202 ORIENTATION TO POLITICAL SCIENCE. (1)
An introduction to topics studied by political scientists and the techniques used in these studies. Lectures, discussions and assigned readings will cover major fields of the discipline and will introduce students to research methods. The course will be offered Pass/Fail only.

PS 210 INTRODUCTION TO EUROPEAN POLITICS: EAST AND WEST. (3)
An introduction to the comparative study of political institutions, policy-making processes, citizen participation, and political outcomes in Eastern and Western European states.

PS 212 CULTURE AND POLITICS IN THE THIRD WORLD. (3)
This course analyzes the politics of selected states in Africa, Asia, and Latin America. Various bases of political cleavage and cooperation will be examined: ethnicity, language, social class and ideology. Cultural differences between Africa, Asia and Latin America will be identified and their political implications explored, as well as differences within geo-cultural areas.

PS 235 WORLD POLITICS. (3)
A study of the most significant problems of world politics, including the fundamental factors governing international relations, the techniques and instruments of power politics, and the conflicting interests in organizing world peace.

PS 240 IDEOLOGY, POLITICAL CHANGE, AND CONTEMPORARY INDUSTRIAL SOCIETY. (3)
A study of contemporary political ideas, social and political change, and their reciprocal relationship primarily in the advanced industrial societies. Ideology as a tool of both political action and analysis will be examined. Substantive discussion of political doctrines will deal with traditional and contemporary forms of liberalism, conservatism, socialism, anarchism and fascism, as well as current revolutionary movements and ideologies.

PS 245 INTRODUCTION TO POLITICAL ANALYSIS. (3)
Introduction to the basic knowledge of research methodology in political science; a review of methods of data collection; historical, quantitative and comparative techniques of analysis.

PS 255 STATE GOVERNMENT. (3)
An introduction to the institutions, political processes and policies of state governments, and the relationships of state governments with other levels of government in the United States.

PS 271 INTRODUCTION TO POLITICAL BEHAVIOR. (3)
The study of behavior in a political context; the analysis of basic behavioral concepts used in political science such as political roles, group behavior, belief systems, personality, power and decision-making.

PS 280 ISSUES IN PUBLIC POLICY. (3)
An examination of selected major public policy problems, focusing on their nature, political ramifications and alternate methods of dealing with them. Policies covered will vary from semester to semester, but will include such areas as poverty, healthcare, energy, education, race relations, environment, etc. Prereq: PS 101.

PS 390 SEMINAR IN POLITICAL SCIENCE. (1-3)
A topical seminar primarily for majors in political science and in related fields. May be repeated to a maximum of 12 credits in seminars of differing topics. Prereq: A standing of 3.0 in the student’s major department or consent of instructor.
PS 435G INDEPENDENT WORK. (1-6)
Consent of instructor. May be repeated to a maximum of 12 credits. Prereq: A standing of 3.0 in political science courses.

PS 399 INTERNSHIP IN GOVERNMENT. (1-6)
This course is designed for students who are participating in a state, local or federal internship program with which the political science department is associated. The student must have approval of the department chairperson upon the recommendation of the Committee on Internship and Experiential Education to take the course, negotiate a learning contract with a departmental academic supervisor, and provide the department with a report or a paper on his internship. Pass/Fail only. May be repeated to a maximum of 12 credits.

PS 411G COMPARATIVE GOVERNMENT – PARLIAMENTARY DEMOCRACIES I. (3)
A study of the governments of Britain and selected Commonwealth countries.

PS 412G COMPARATIVE GOVERNMENT – PARLIAMENTARY DEMOCRACIES II. (3)
A study of the political systems of selected continental European countries with special attention to France and Germany.

*PS 417G SURVEY OF SUB-SAHARAN POLITICS. (3)
A survey of sub-Saharan government and politics intended to give the student broad knowledge about the setting of African politics, precolonial African political systems, the political legacies of major European colonial powers, and problems of political development. (Same as AAS 417G.)

**PS 419G THE GOVERNMENTS AND POLITICS OF EASTERN ASIA. (3)
A comparative analysis of the political development in India, Pakistan, Bangladesh and Sri Lanka, with emphasis on political cultures, participation, institutions and the capabilities of these political systems.

PS 420G GOVERNMENTS AND POLITICS OF SOUTH ASIA. (3)
Study of the political processes, problems and behavior of the several states of Southeast Asia with emphasis on their chief determinants. The different patterns of political development will be examined. Lecture, three hours.

PS 427G EAST EUROPEAN POLITICS. (3)
This course is meant to provide an opportunity for advanced undergraduates and graduate students to (1) understand the historical, socioeconomic and philosophical context of the communist party states in Eastern Europe, (2) to learn who governs in Eastern Europe and the structures through which they rule, (3) to assess the “dynamics” of communist politics, i.e., factors contributing to political change vis-à-vis political continuity. Prereq: Junior or senior standing and instructor’s written permission.

PS 428G LATIN AMERICAN GOVERNMENT AND POLITICS. (3)
A study of contemporary Latin American political institutions and of the dynamics of the Latin American political process.

PS 429G GOVERNMENT AND POLITICS IN RUSSIA AND THE POST-SOVIET STATES. (3)
Analysis of political development in the Soviet Union with emphasis on party-government relations, Communist ideology, and major approaches to the study of Soviet politics.

PS 430G THE CONDUCT OF AMERICAN FOREIGN RELATIONS. (3)
The formulation of American foreign policy from several analytic perspectives, with somewhat more emphasis on inputs and process than on substantive outputs. Prereq: PS 101 or consent of instructor.

PS 431G NATIONAL SECURITY POLICY. (3)
The organization and formulation of military policy; the theory and practice of deterrence; and the problems of disarmament and arms control. Prereq: PS 235 or consent of instructor.

PS 433G POLITICS OF INTERNATIONAL ECONOMIC RELATIONS. (3)
The course examines contending theoretical approaches to global political economy. These approaches are used to analyze various issues of global political economy, such as the international monetary system, multinational corporations, foreign aid, and trade.

PS 436G INTERNATIONAL ORGANIZATION. (3)
A study of the evolution of international organizations in the 20th Century. Examination of the increasing size, complexity, and diversity of contemporary global and regional international organizations. The role of international organizations in future world order.

PS 437G DYNAMICS OF INTERNATIONAL LAW. (3)
An examination of the politics of the development of international law and its operation in a multicultural world. Legal principles and international political processes are discussed through illustrative issue areas: management of conflict; distribution of territorial resources; environmental problems; and human rights.

PS 439G CONTEMPORARY INTERNATIONAL PROBLEMS. (3)
An examination of selected current problems in world politics and foreign policy. Students will be encouraged to apply their knowledge to the analysis of contemporary international issues.

PS 441G EARLY POLITICAL THEORY. (3)
A survey of political theorists in the Western political tradition from classical Greece to the Renaissance. The formative influences upon our conceptions of politics, citizenship, justice, and natural rights will be highlighted and key issues in controversies over rhetoric and philosophy, time and political order, education and the body politic, and political action and human artifice will be illuminated.

PS 442G MODERN POLITICAL THEORY. (3)
Western political theory from Machiavelli to Marx and Weber with emphasis on the impact of early modern culture and liberalism upon contemporary views of power, individualism, community, and political consciousness. Key contributions of modern political theorists to perennial debates on power and the intellectual, institutional bases of modern constitutionalism, human nature and aggression, the sources of alienation, and the relation of modern science and technology to contemporary forms of domination will be explored.

PS 453G URBAN GOVERNMENT AND POLITICS. (3)
An analysis of the formulation of public policy in small towns, middle-sized cities, and metropolitan areas. A theoretical model appropriate to all three settings will be formulated. The principal methods of studying community decision-making will be evaluated. Prereq: Three hours of social sciences.

PS 454G POLITICS OF LAND USE AND GROWTH MANAGEMENT. (3)
A study of the interrelationships of the Southern Appalachian region and its people with the larger American political system, culture, and economy. Selective examination of public policies and major issues and their development in the politics of the region.

PS 455G APPALACHIAN POLITICS. (3)
A study of the philosophy and development of civil liberties in the U.S. Major concentration on the interpretation of constitutional guarantees by the Supreme Court.

PS 461G CIVIL LIBERTIES. (3)
A study of the philosophy and development of civil liberties in the U.S. Major concentration on the interpretation of constitutional guarantees by the Supreme Court.

PS 463G THE AMERICAN JUDICIAL PROCESS. (3)
A study from the standpoint of the social sciences, of the judicial process at the state and national levels, dealing with the organization of courts, the making of judicial decisions, and the exercising of judicial power.

PS 465G CONSTITUTIONAL LAW. (3)
A non-chronological study of major Supreme Court decisions and recent issues relating to separation of powers, federalism, the commerce clause, taxes, criminal justice and other non-civil liberties areas. Prereq: PS 101 or consent of instructor.

PS 467G THE U.S. SUPREME COURT. (3)
A study of the Court as a political-legal institution, focusing on the appointment of justices, the development of its docket, the decisional process, and its interaction with other political institutions. Prereq: PS 101 or consent of instructor.

PS 470G AMERICAN POLITICAL PARTIES. (3)
An analysis of American national and state party systems, organization, and functions; nominations and elections; and voting patterns.

PS 472G POLITICAL CAMPAIGNS AND ELECTIONS. (3)
An analysis of individual voting behavior and candidate strategies during presidential and congressional elections. The effect of the mass media, political action committees, and political advertising on the vote decision is examined. Attention is also devoted to candidates’ campaign organizations and communication strategies.

PS 473G PUBLIC OPINION. (3)
An introduction to the nature and content of public opinion, how polls are conducted, the political effects of polling, and the role of public opinion in the policymaking process.
PS 474G POLITICAL PSYCHOLOGY. (3)
An introduction to the development of different models of political behavior, based on concepts of psychoanalysis, behaviorism, humanism, and social psychology. Prereq: PS 101 and PSY 100 or equivalent, or consent of instructor.

PS 475G POLITICS AND THE MASS MEDIA. (3)
The ways the modern mass media affect the dynamics of politics in the United States are examined in this course. Specific topics include the impact of television on political discourse, the structure and ownership of mass media, how news is made and how it influences our political attitudes and behaviors; the role of the media in campaigns, elections and policy making. Prereq: PS 101.

PS 476G LEGISLATIVE PROCESS. (3)
A study of Congress and the state legislatures, covering the legislative power structure, legislative committees, the selection of legislators and the roles they play, decision making, and the relations of the legislative and executive branches.

PS 479 WOMEN AND POLITICS. (3)
A study of the role of women as political actors in the United States including the status of women in American society and the contribution of government policy to maintaining or changing that status. The political behavior of women at the mass and elite level will be examined.

PS 480G GOVERNMENT AND THE ECONOMY. (3)
This course analyzes the relationship between political and economic systems in the modern, democratic, capitalist state. While the focus is primarily upon the United States, other political/economic systems as well as more general theoretical statements will be considered. Prereq: PS 101 and ECO 101 or equivalent.

PS 487G INTRODUCTION TO PUBLIC ADMINISTRATION. (3)
A study of theories of administration and organization, problems of management and control, the principal staff and auxiliary functions and agencies, and the problem of administrative responsibilities under democratic government, and the political, social, and institutional context of administration.

PS 488G THE ANALYSIS OF PUBLIC POLICY. (3)
A study of the development, implementation and impacts of government policies; and the sources of variation in policies adopted by differing governmental units.

PS 490HONORS IN POLITICAL SCIENCE. (3)
This course will provide, in a seminar setting, the opportunity for students to concentrate on developing and implementing research projects on topics of their own choice. The course will allow discussion of various perspectives in political science as well as on problems encountered in the research process. Prereq: Senior standing with 3.25 overall GPA and 3.50 GPA in major.

PS 491 SPECIAL TOPICS IN POLITICAL SCIENCE (Subtitle required). (1-3)
Course will focus on selected topics drawn from various areas of political science taught by faculty members with special interests and competence. May be repeated in courses of differing topics to a maximum of 12 credits.

PS 538 CONFLICT AND COOPERATION IN LATIN AMERICAN RELATIONS. (3)
An examination of (1) national development strategies as determinants of Latin American foreign policies, (2) the origins and political consequences of economic nationalism, (3) historical patterns of U.S. response to reformist and/or revolutionary change, (4) the role of extra-continental contenders for influence in the Americas, and (5) at least one contemporary foreign policy issue in inter-American relations. Prereq: PS 428G or permission of instructor.

PS 545 AMERICAN POLITICAL THOUGHT. (3)
This course explores the American tradition of political thought, its formation, and the ways it is involved in major problems of culture, political economy, ideology, and identity. Alternative ideas of work, power, political obligation, science and technology, and related issues are examined. Relationships of theory and practice, public and private, and government and society are analyzed.

PS 557 KENTUCKY GOVERNMENT AND POLITICS. (3)
A study of current political issues and institutions in Kentucky.

PS 566 CONSTITUTIONAL INTERPRETATION. (3)
A study of the political and philosophical origins of the U.S. Constitution and of the competing and overlapping philosophies about how it should be interpreted in modern times. Prereq: One of the following: PS 461G, PS 465G, or HIS 573.

PS 571 INTEREST GROUPS. (3)
A study of interest groups, their roles in the political process, and techniques of lobbying and influencing opinion. Prereq: Junior standing.

PS 580 THE BUDGETARY PROCESS. (3)
A study of the development of budgetary techniques in the United States, the uses to which budgets are put, the roles of the budgetary process in budgetary politics and in the functioning of government, and the distribution of government resources through the budget.

PS 584 THE AMERICAN PRESIDENCY AND THE FEDERAL EXECUTIVE. (3)
A course in the American presidency, emphasizing institutional developments and the impact of recent presidents on the office, on other governmental institutions, on domestic and foreign policies, and including an examination of the broader context of the executive branch of government.

PS 620 COMPARATIVE POLITICS: THEORY AND METHOD. (3)
A study of the evolution and development of comparative government and politics within the discipline with particular emphasis upon the formulation, application, and limitations of the theories, taxonomies and conceptual frameworks employed in comparative research.

PS 630 PROSEMINAR IN NON-INSTITUTIONAL POLITICAL BEHAVIOR. (3)
Focuses on literature with implications for individual-level political behavior, particularly mass behavior. Major works in such fields as political socialization, biopolitics, political communication, and political games and coalitions. Specific content may vary in response to current demands. Readings in a substantive field such as voting behavior are also examined as examples of the application of listed areas. Prereq: Consent of instructor.

PS 654 PROSEMINAR IN JUDICIAL PROCESS. (3)
A thorough survey of the recent literature in the judicial process, focusing particularly on judicial recruitment, the relationship of the judiciary to other power centers, and the decision-making process of judges.

PS 671 STRATEGIES OF INQUIRY IN POLITICAL SCIENCE. (3)
Analysis of research paradigms for political science, and investigation into the foundations of scientific inquiry. Emphasis on topics such as explanation, concept formation, the construction and function of theory, data, and verification.

PS 672 INTRODUCTION TO TECHNIQUES OF POLITICAL RESEARCH. (3)
Basic techniques of data collection, coding, and processing applicable to political research are introduced. Various statistical techniques of data analysis are discussed and applied to political data. Prereq: PS 671, familiarity with appropriate statistical methods and consent of instructor.

PS 674 PROSEMINAR IN THEORIES OF INTERNATIONAL POLITICS. (3)
A survey of the major theoretical approaches to the study of international systems and processes.

PS 680 PROSEMINAR IN POLITICAL INSTITUTIONS AND PROCESS. (3)
A thorough survey of recent literature on political institutions and the political process, including political parties and the legislative and executive processes, at the national and sub-national levels.

PS 685 PROSEMINAR IN PUBLIC ADMINISTRATION AND POLICY. (3)
A survey of recent literature on public administration and public policy, including organizational theory, the political environment of administration, public budgeting, public personnel administration, public policy administration, and public management.

PS 690 PROSEMINAR IN CONTEMPORARY POLITICAL THEORY. (3)
An examination of contemporary political theories, especially their relationships to theoretical issues in policy analysis. Major problems such as inquiry and change, ideology and power, and knowledge and authority will be studied, particularly in the context of public policy.

PS 711 TOPICAL SEMINAR IN POLITICAL SCIENCE (Subtitle required). (3)
Topic and instructor will vary from semester to semester. Faculty member presents seminar on topic in which he has particular research competence or special expertise. May be repeated under different subtitle to a maximum of nine hours. Prereq: Two semesters of graduate work and consent of instructor.
PS 730 AMERICAN FOREIGN POLICY. (3)
The course emphasizes contending interpretations of the nature and sources of American foreign policy, the position of the United States in the international system, and foreign policy decision making. Prereq: Consent of instructor.

PS 731 INTERNATIONAL SECURITY/CONFLICT ANALYSIS. (3)
The seminar examines international security affairs, with an emphasis on the sources and nature of conflict, and methods of conflict, the patterns of conflict, and methods of conflict resolution and regulation, both within states and among them. Prereq: Consent of instructor.

PS 733 INTERNATIONAL POLITICAL ECONOMY. (3)
The course examines the contending theoretical perspectives and substantive functional issues underlying the politics of international economic relations. Special attention is paid to international trade and money, the politics of North-South relations, and comparative foreign economic policies. Prereq: Consent of instructor.

PS 737 TRANSNATIONAL ORGANIZATIONS AND PROCESSES. (3)
An analysis of approaches to the study of international, transnational and regional political and economic organizations and processes within the context of world politics. An examination of the impact of these activities and processes on contemporary problems of world order. Prereq: Graduate student status.

PS 738 SEMINAR IN THE POLITICS OF ECONOMIC DEVELOPMENT (Subtitle required). (3)
An analysis of the political environment and consequences of policy-making for developmental ends in Latin America, Africa, the Mid-East or Asia. Economic policy-making will be emphasized, but consideration may also be directed to housing, health, and educational policy-making. Course will generally focus on a geographic area. May be repeated to a maximum of nine credits under different subtitles. Prereq: Introductory economics or consent of the instructor.

PS 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PS 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

PS 750 POLITICAL PARTIES AND ELECTIONS IN AMERICA. (3)
A study of the organization and functions of political parties, nominations and elections, and voting alignments. Prereq: An undergraduate political parties course or consent of instructor.

PS 757 SEMINAR IN COMPARATIVE DEMOCRATIC POLITICAL SYSTEMS. (3)
An analysis of democratic political systems with emphasis upon the comparative approach as a method of political analysis. Prereq: PS 411G or consent of instructor.

PS 758 SEMINAR IN SOVIET POLITICS, GOVERNMENT AND FOREIGN POLICY. (3)
A study of the organization and functions of political parties, nominations and elections, and voting alignments. Prereq: An undergraduate political parties course or consent of instructor.

PS 762 SEMINAR IN JUDICIAL POLICY MAKING. (3)
Formulation, development and implementation of Constitutional policy by the United States Supreme Court and other agencies. Primary focus on areas of contemporary importance (excluding civil rights). Cases and supporting materials. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PS 763 SEMINAR IN ADMINISTRATIVE POLITICS. (3)
The process by which administrative agencies establish and enforce policy are analyzed in terms of both legal and political considerations and behavioral theory. Prereq: Consent of instructor.

PS 768 RESIDENCE CREDIT FOR THE MASTER'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

PS 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (0-12)
May be repeated indefinitely.

PS 770 DEMOCRATIC THEORY AND PUBLIC POLICY. (3)
This seminar focuses on the relationship of democratic theories to specific issues of public policy, including the role of values in policy analysis. Questions of science, ethics, and democracy and the relationship between technical knowledge and political knowledge may receive attention. Prereq: PS 690 or consent of instructor.

PS 772 ADVANCED PROBLEMS IN RESEARCH METHODS. (3)
A seminar in selected topics; the application of mathematical models and advanced statistical techniques to political science data. May be repeated to a maximum of six credits.

PS 775 SEMINAR IN PUBLIC POLICY. (3)
A political analysis of the domestic policy process including the formation, implementation, and impact of policy.

PS 778 RESEARCH PROBLEMS IN TRANSNATIONAL POLITICS. (3)
This seminar focuses on research strategies that can be utilized in dealing with problems in transnational politics. May be repeated to a maximum of six hours with consent of the instructor. Prereq: PS 620 or PS 674.

PS 780 LEGISLATIVE BEHAVIOR. (3)
A study of recent research in the legislative process emphasizing both the substantive and methodological aspects. Prereq: An upper division course in the legislative process or consent of instructor.

PS 785 PSYCHOLOGICAL BASES OF POLITICAL BEHAVIOR. (3)
An examination of democratic political systems with emphasis upon the comparative approach as a method of political analysis. Prereq: PS 411G or consent of instructor.

PS 795 SPECIAL PROBLEMS IN POLITICAL SCIENCE. (1-3)
Specific programs of readings are developed to meet the needs of individual students. May be repeated to a maximum of six credits for master’s students and 12 credits for Ph.D. students. Prereq: Any 600 level course in political science or consent of the Director of Graduate Study.

PS 796 DIRECTED RESEARCH IN POLITICAL SCIENCE. (1-3)
Individual research in a particular field of political science under the supervision of selected faculty. Open to advanced graduate students who are prepared for intensive study and research beyond that offered in regular classes in each field. May be repeated to a maximum of six hours. Prereq: Consent of the instructor and the director of graduate studies.

PSC Psychiatry

PSC 815 FIRST-YEAR ELECTIVE, PSYCHIATRY. (1-4)
With the advice and approval of his or her faculty adviser, the second-year student may choose approved electives offered by the Department of Psychiatry. The intent is to provide the student an opportunity for exploration and study in an area which supplements and/or complements required course work in the second-year curriculum. Pass-fail only. Prereq: Admission to second-year medical curriculum and approval of adviser.

PSC 841 PSYCHIATRY SELECTIVE. (4)
Designed to give fourth year medical student advanced exposure to principles and practice of psychiatry with close faculty supervision. Formalized seminars. Includes outpatient specialty wards, family counseling, emergency areas, consult psychiatry and geropsychiatry. Advance instruction in psychopharmacology and neurochemistry, straightforward constructs in psychotherapy, couple/family assessment, crisis intervention, etc. Course individualized within department, staffing patterns. Grade determined by supervisor’s assessment of knowledge, skills, performance and progress. Four-week rotation. Prereq: PSC 831.

PSC 850-899 FOURTH-YEAR ELECTIVE FOR MEDICAL STUDENTS. (1-6)
With the advice and approval of the faculty adviser and the Student Progress and Promotions Committee, the fourth-year student may choose approved electives offered by the various departments in the College of Medicine. The intent is to provide the student an opportunity to develop his fund of knowledge and clinical competence. Prereq: Admission to the fourth year, College of Medicine and/or permission of the Student Progress and Promotions Committee.

Approved electives:
PSC 869 RESEARCH IN PSYCHIATRY
PSC 876 TRIPLE BOARD ACTING INTERNSHIP
PSC 890 OFF-SITE CLERKSHIP IN PSYCHIATRY
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Course Description</th>
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<tbody>
<tr>
<td>PSY 100 INTRODUCTION TO PSYCHOLOGY.</td>
<td>An introduction to the study of behavior covering theories, methods and findings of research in major areas of psychology. Topics covered will include the biological foundations of behavior; learning, perception, motivation, personality; developmental, abnormal, and social behavior; and methods of assessment. This course is a prerequisite to a significant number of courses in this and related areas of study. Lecture, three hours; laboratory/discussion, two hours.</td>
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<td>PSY 100.</td>
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<tr>
<td>PSY 195 ORIENTATION TO PSYCHOLOGY.</td>
<td>An orientation to educational issues and career planning for students who have declared psychology as a major. Topics include career paths and opportunities, professional resources and issues, and educational planning. Pass/Fail only. Prereq: Declared major in Psychology, or consent of instructor.</td>
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<tr>
<td>PSY 215 EXPERIMENTAL PSYCHOLOGY.</td>
<td>A study of the application of scientific methods to psychological research. Special emphasis is placed on the critical evaluation of contemporary research in experimental psychology. Particular attention is focused on the design, execution, and written report of laboratory research. Lecture, three hours; laboratory, two hours. Prereq: PSY 100 and sophomore standing, or consent of instructor.</td>
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<tr>
<td>PSY 216 APPLICATIONS OF STATISTICS IN PSYCHOLOGY.</td>
<td>An introduction to statistical procedures used in making decisions based on psychological data. May not be used to satisfy the laboratory requirement in the College of Arts and Sciences. Lecture, three hours; laboratory, two hours. Prereq: PSY 100.</td>
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<tr>
<td>PSY 223 DEVELOPMENTAL PSYCHOLOGY.</td>
<td>An introduction to the principles of developmental psychology as seen in human growth over the entire lifespan, with the primary focus on infancy through adolescence. Emphasis is placed on theory and data relating to the developmental aspects of cognition, language and personality. Prereq: PSY 100 or equivalent. (Same as FAM 254.)</td>
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<tr>
<td>PSY 302 PSYCHOLOGY IN BUSINESS AND INDUSTRY.</td>
<td>Survey of the many applications of psychological principles and methods to problems in business and industry. Topics include consumer research and marketing, personnel selection, performance appraisal, employee training, motivation, leadership, dynamics of work groups, job stress, and person-machine interactions. Prereq: PSY 100.</td>
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<tr>
<td>PSY 305 PSYCHOLOGY OF SEX ROLES.</td>
<td>A survey of the psychology of sex roles designed for the upper division undergraduate. The course will explore sex roles as they have been examined in the research literature of the social personality, developmental, physiological, and clinical areas of psychology. Both theoretical concepts and research findings will be considered. Prereq: PSY 100 and sophomore standing.</td>
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<tr>
<td>PSY 331 THE PSYCHOLOGY OF ADJUSTMENT.</td>
<td>The individual’s psychological adjustment to society is analyzed from a mental health perspective. The course provides a general orientation to the normal-abnormal continuum of behavior, including individual, social, and cultural determinants of behavior. Prereq: PSY 100. Not open to students who have had CH 520.</td>
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<tr>
<td>PSY 395 INDEPENDENT WORK IN PSYCHOLOGY.</td>
<td>Designed for advanced students who assist faculty members on research projects that are conducted in regular consultation with the faculty member. Those students who take the course for three credits will meet as a group with a faculty member on a weekly basis; written and reading assignments will be given and the students will discuss the projects on which they are involved. May be repeated to a maximum of 12 credits. Pass-Fail only. Prereq: Major in the department with a standing of 3.0 in psychology courses. A signed contract between student and faculty member must be filed in the departmental office prior to enrollment in the course.</td>
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<tr>
<td>PSY 399 FIELD BASED/COMMUNITY BASED EDUCATION.</td>
<td>A community-based or field-based experience in psychology, under the supervision of a faculty member. May be repeated to a maximum of 12 credits (if applicable). Pass-Fail only. Prereq: Consent of instructor and department chairperson; filing of a learning contract with departmental office and Office for Experiential Education; completion of 12 hours in psychology with a GPA of 2.5 in psychology courses. Psychology majors, juniors and seniors only.</td>
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<tr>
<td>PSY 400 HISTORY AND SYSTEMS OF PSYCHOLOGY.</td>
<td>The course is designed primarily for majors in psychology in the senior year. A review of the history of psychology with special emphasis on the development of major psychological theories. The philosophical origins of psychology as a science are analyzed along with their impact on important psychologists. The influence of psychology’s history on its current concepts, methods and problems is studied. Prereq: PSY 100.</td>
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<td>PSY 421 COGNITIVE PROCESSES LABORATORY.</td>
<td>Laboratory for PSY 427 to provide experience with the research methods of cognitive psychology. Lab sessions involve participation in a series of experiments on attention, memory, language, and problem-solving. Laboratory: two hours. Prereq or concurrent: PSY 427.</td>
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<tr>
<td>PSY 423 PROCESSES OF PSYCHOLOGICAL DEVELOPMENT.</td>
<td>An advanced lecture course for majors in the life sciences (social, behavioral, and biological). The course will examine the nature of developmental processes in the areas of intelligence, learning, personality, and social behavior. Students will be required to do extensive reading in primary source materials. Prereq: PSY 223 or consent of instructor.</td>
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<td>PSY 424 HUMAN SENSES AND PERCEPTION.</td>
<td>A study of the stimulus, receptor and organism variables that underlie perceptual experience and perceptually based behavior with emphasis upon theory and experimental method. Prereq: PSY 100.</td>
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<td>PSY 425 DIMENSIONS OF AGING.</td>
<td>Analysis of demographic and institutional patterns, social roles, psychological and physiological changes, and social policies and programs associated with aging. Prereq: Six hours of social science or permission of instructor. (Same as SOC 425, ANT 425.)</td>
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<td>PSY 426 HUMAN SENSE AND PERCEPTION LABORATORY.</td>
<td>Laboratory to accompany PSY 424. Laboratory consists of a series of exercises and experiments with students serving as experimenters and subjects. Emphasis is on perceptual content, but methods and report writing are also stressed. The course includes prescribed studies of visual fields, auditory discrimination, visual acuity, form perception, space perception and binocular rivalry in addition to a final independent project of the student’s own choice. Laboratory, two hours. Prereq or conc: PSY 424; PSY 216 is recommended.</td>
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<td>PSY 427 COGNITIVE PROCESSES.</td>
<td>Theory and experimental techniques in the study of human thought processes. Emphasis on research in memory, information processing, language, and concept formation. Prereq: PSY 100.</td>
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<tr>
<td>PSY 428 RESEARCH METHODS IN DEVELOPMENTAL PSYCHOLOGY.</td>
<td>An advanced course in research methods in human development. Emphasis will be placed on the understanding and use of research designs and techniques that examine behavior change from a developmental perspective. Students are expected to design and carry out a research project. Lecture, three hours; laboratory, two hours. Prereq: PSY 100, 215, and 216.</td>
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<td>PSY 439 INTERPERSONAL PROCESSES.</td>
<td>A systematic analysis of interpersonal behavior. Topics covered include social-cognitive aspects of interpersonal relations (e.g., expectancy, attribution), personal relationships (e.g., friendship, romance), and small-group dynamics (e.g., minority influence, cooperative learning). Prereq: PSY 100.</td>
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<td>PSY 444 SOCIAL PSYCHOLOGY.</td>
<td>Theoretical and empirical analysis of individual behavior in the social setting with particular emphasis on social learning, motivation, and the measurement, formation, and changing of social attitudes. (Note: Not open for graduate credit to graduate students in Psychology and Sociology.) Prereq: One of the following: PSY 100, SOC 101, or GEN 102. (Same as SOC 444.)</td>
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<td>PSY 447 SOCIAL PSYCHOLOGY LABORATORY.</td>
<td>Participation in the use of survey, laboratory, and field research methods for studying social-psychological phenomena. Class members will design and carry out research on basic social-psychological processes. Laboratory, two hours. Prereq: PSY 215; and (may be concurrent) one of the following: PSY 444, PSY 448, or PSY 439.</td>
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<tr>
<td>PSY 448 APPLIED SOCIAL PSYCHOLOGY.</td>
<td>Application of social-psychological knowledge, both theoretical and empirical, to contemporary social issues. Coverage includes application to such diverse topics as health, education, business, law, and international relations. Prereq: PSY 100. (Same as SOC 448.)</td>
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<td>PSY 450 PSYCHOLOGY OF LEARNING.</td>
<td>Fundamental principles and findings from laboratory investigations of classical, instrumental, and verbal learning. Prereq: PSY 215.</td>
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<td>PSY 451 PSYCHOLOGY OF LEARNING LABORATORY.</td>
<td>Laboratory demonstration of, and participation in, the use of scientific methodology as it applies to basic principles of learning appearing in human and subhuman subjects. Laboratory, two hours. Prereq or conc: PSY 450; PSY 216 is recommended.</td>
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PSY 456 BEHAVIORAL NEUROSCIENCE. (3)
An intensive study of neural bases of behavior. Principal concerns are the neural and
chemical substrates of processes such as sensation and perception, learning and memory,
motivation and emotion, and behavior disorders. Prereq: PSY 215 and BIO 103, or 150
or equivalent, or consent of instructor.

PSY 457 BEHAVIORAL NEUROSCIENCE LABORATORY. (1)
Laboratory for PSY 456 provides firsthand experience with the research methodology
of physiological psychology. Prereq or concur: PSY 456.

PSY 459 DRUGS AND BEHAVIOR. (3)
General principles of drug action from a physiological perspective. Major emphasis is
on the psychoactive drugs encountered in experimental, clinical and social settings.
Prereq: PSY 215 and BIO 103, or BIO 150 or equivalent.

PSY 495 SENIOR THESIS SEMINAR. (4)
This course focus will be on the development and presentation of a research question,
and the design of an experimental test of the question. The course will use a seminar
format. Students will be expected to give both an oral and written presentation of their
research proposal and to participate in the discussion of the proposals of other students.
Prereq: Major in psychology, senior status, research sponsor, approval of instructor.

PSY 496 SENIOR THESIS RESEARCH. (4)
This course focus will be on the oral and written presentation of research results.
The course will use a seminar format. Students will complete their thesis research, prepare
a written report, and present it to the seminar. Prereq: PSY 495.

PSY 503 PSYCHOLOGY OF INDUSTRIAL PERSONNEL PROCEDURE. (3)
A practical course for those preparing for personnel administration and for psychology
in industry and business. A study is made of the theory and methods of position
classification, job analysis, job evaluation, merit rating, supervisor selection and
training, and collective bargaining. Prereq: PSY 100.

PSY 529 PSYCHOLINGUISTICS. (3)
Study of the acquisition, production and perception of human language. The relationship
between linguistic theories and experimental data will be critically examined. Prereq: Either PSY 215 or LIN 211.

PSY 532 PERSONALITY. (3)
An examination of several prominent personality theories in terms of the contexts in
which they were originated, their influence upon contemporary psychological thought,
and their present applications. Prereq: PSY 100 plus one of the following: PSY 215,
216 or 223.

PSY 533 ABNORMAL PSYCHOLOGY. (3)
A study of the major mental disorders, especially the psychoneuroses and the psychoses,
and the biological, psychological, and sociological factors which contribute to their
causation. Prereq: PSY 100 plus one of the following: PSY 215, 216 or 223.

PSY 534 CHILD PSYCHOPATHOLOGY. (3)
The course is designed to cover issues in the classification, assessment, and treatment
of the major childhood behavior disorders, including attention deficit and conduct
disorders, learning disabilities, depression, and child abuse. In addition, issues relating
to parent-child relations, divorce, and children’s attributions will be covered. Prereq:
PSY 215; and either PSY 223 or 533 or FAM 255.

PSY 535 PSYCHOLOGICAL TESTING. (3)
A general orientation to the field of psychological testing. Introduction to the principles
and methods of psychological testing, and a survey of the various kinds of psychological
tests. Prereq: PSY 100 and 216.

PSY 552 ANIMAL BEHAVIOR. (3)
Experimental techniques used in the study of animal behavior. Particular emphasis is
placed on the assessment of intellectual capacities in animals. Topics include: memory,
concept learning, imitation, tool use, language, cooperation, and altruism. Prereq:
PSY 215 or consent of instructor.

PSY 553 ANIMAL BEHAVIOR LABORATORY. (1)
Application of techniques used in the study of animal behavior. The class will design
and carry out experiments in animal behavior. Students will organize and discuss results
and will explore theoretical and applied implications of the research. Laboratory, two
hours. Prereq or concur: PSY 552. Prereq: PSY 216.

PSY 558 BIOLOGY OF MOTIVATION. (3)
An examination of the causes of human and nonhuman behavior from a biological
perspective. Special attention is paid to the interaction between genetic inheritance,
individual experience, and physiological state in the control of the appetitive and
consummatory behaviors. Prereq: PSY 215 and BIO 103, or BIO 150 or equivalent.

PSY 561 ADVANCED TOPICS IN FOUNDATIONS OF CLINICAL PSYCHOLOGY (Subtitle required). (3)
Selected topics in clinical psychology such as health psychology and introduction to
clinical psychology. Course topics will vary from year to year, providing students with
a diversity of material in the area of clinical psychology. May be repeated to a maximum
of six credits. Prereq: PSY 533 or PSY 532.

PSY 562 ADVANCED TOPICS IN COGNITIVE PSYCHOLOGY (Subtitle required). (3)
This course is designed to provide in-depth study of a specialized topic within cognitive
psychology. Topics will vary from year to year and may include: theories of memory;
thories of reading; cognition and emotion; connectionist modeling; engineering and
environmental psychology. May be repeated to a maximum of six credits. Prereq:
PSY 427 or equivalent.

PSY 563 ADVANCED TOPICS IN DEVELOPMENTAL PSYCHOLOGY (Subtitle required). (3)
This course is designed to provide in-depth study of a specialized topic in developmental
psychology. Topics will vary from year to year and may include: cognitive development;
development of memory and attention; development of reasoning and problem solving;
and media use and children’s development. May be repeated to a maximum of six credits.
Prereq: PSY 223 or equivalent.

PSY 564 ADVANCED TOPICS IN LEARNING (Subtitle required). (3)
The course will provide in-depth study of specialized topics in the area of higher learning
in animals. Topics will vary from year to year and may include concept learning, memory,
imitation, language, and cooperation. The course will also examine these processes from
the perspective of sociobiology. May be repeated to a maximum of six credits. Prereq:
PSY 450, PSY 552 or consent of instructor.

PSY 565 ADVANCED TOPICS IN NEUROSCIENCE (Subtitle required). (3)
Advanced coverage of recent research within the field of behavioral neuroscience. The
course will provide in-depth coverage of one topic, such as developmental psychobi-
ology, neurobiology of learning and memory, or the biological basis of reward. May
be repeated to a maximum of six credits. Prereq: PSY 456 or consent of instructor.

PSY 566 ADVANCED TOPICS IN SOCIAL PSYCHOLOGY (Subtitle required). (3)
Selected topics exploring aspects of social psychology. The content of the course will
vary from year to year, focusing on topics such as social cognition, the self, cross-cultural
psychology, personal relationships, consumer and organizational psychology, and
nonverbal communication. Class format will be determined by the instructor, with some
years having a small seminar structure and other years having a more traditional lecture
format. May be repeated to a maximum of six credits. Prereq: PSY 444, PSY 216, or
counselor of instructor.

PSY 603 PSYCHOPATHOLOGY. (3)
An examination of the descriptive, theoretical, and research material relevant to the major
classes of disturbed behavior. Special attention is devoted to the stylistic features of
neurotic and psychotic communication and behavior. Prereq: Enrollment in the graduate
program in clinical psychology.

PSY 610 PSYCHOMETRICS. (3)
Analysis and interpretation of human measurements. The course deals with the
application of basic inferential procedures to the analysis and interpretation of
psychological data. Required of all graduate students in psychology. Prereq: A course in
statistics.

PSY 611 PSYCHOLOGICAL RESEARCH. (3)
The course deals with the design of psychological experiments. Emphasis is upon issues
concerning choice of appropriate designs for psychological research. Both experimental
and correlational research designs are studied. Required of all graduate students in
psychology. Prereq: PSY 610 or permission of instructor.

PSY 613 BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course introduces students to major topics in behavioral ecology and comparative
neurobiology with an emphasis on inter-relationships between these fields. Topics to
be covered vary each semester, but typically include: the optimality approach to
understanding behavior, predator-prey behavior, mating and social behavior, behavioral
genetics, neural circuits and behavior, sensory biology, neural development, and
neural plasticity. Prereq: Permission of the instructor. (Same as ANA/BIO/ENT/PGY 613.)
Key:

# = new course  * = course changed  † = course dropped  ¶ = course removed from Bulletin due to inactivity

#PSY 614 TECHNIQUES IN BEHAVIORAL ECOLOGY AND COMPARATIVE NEUROBIOLOGY. (2)
This course provides students with instruction and experience in the experimental research techniques employed in the study of behavioral ecology and comparative neurobiology with emphasis on the integration of these approaches for understanding animal behavior. Each student will carry out three small research projects in the laboratories of three of the participating faculty. Techniques to be covered include: molecular and genetic methods, neuroanatomical and neurophysiological techniques, and field and laboratory methods for quantifying behavior and studying effects of social and environmental influences on behavior. Prereq: Permission of the instructor. (Same as ANA/BIO/ENT/PGY 614.)

PSY 616 RESEARCH DESIGN IN CLINICAL PSYCHOLOGY. (3)
Concentrates on current methodologies utilized in clinical research and on the application of sophisticated techniques to traditional research problems. Students are expected to master critical skills for the evaluation of research designs and are encouraged to explore creative approaches to research in important clinical areas. Prereq: Enrollment in the graduate program in clinical psychology.

PSY 620 PROSEMINAR IN HISTORY AND SYSTEMS OF PSYCHOLOGY. (3)
A study of the philosophical precursors and scientific traditions of psychology. The schools of 19th and 20th century psychology are surveyed as are the major theoretical positions and content areas of contemporary psychology. Prereq: Graduate standing in Department of Psychology or Department of Educational and Counseling Psychology. (Same as EDP 615.)

PSY 621 PROSEMINAR IN LEARNING. (3)
An intensive treatment of concepts, methodology, and current developments in the field of learning. Prereq: PSY 550 or equivalent.

PSY 622 PROSEMINAR IN PERSONALITY. (3)
An intensive treatment of theories, methods of investigation and current developments in the area of personality. Prereq: PSY 532 or equivalent.

PSY 623 PROSEMINAR IN SENSATION AND PERCEPTION. (3)
An intensive examination of the facts, methods and concepts involved in the study of sensory and perceptual processes. Prereq: Consent of instructor.

PSY 624 PROSEMINAR IN SOCIAL PSYCHOLOGY. (3)
An intensive examination of the methods and data of social psychology with emphasis on social attitudes. Prereq: PSY 444G or equivalent.

PSY 625 PROSEMINAR IN DEVELOPMENTAL PSYCHOLOGY. (3)
An intensive treatment of theoretical and experimental literature, both classical and contemporary, in developmental psychology. Prereq: Admission to the graduate program in psychology or consent of instructor.

PSY 626 SURVEY OF HEALTH PSYCHOLOGY. (3)
A survey of the field of health psychology. It will explore the ways in which social and psychological research contribute to an understanding of health and illness behavior. Prereq: Graduate or professional standing and consent of instructor. (Same as BSC 626.)

PSY 627 PROSEMINAR IN PHYSIOLOGICAL PSYCHOLOGY. (3)
An intensive examination of theories, methods of investigation, and current developments in the field of physiological psychology. Prereq: Graduate standing or permission of instructor. (Same as PYS 627.)

PSY 628 PROSEMINAR IN COGNITIVE PROCESSES. (3)
An intensive examination of theoretical and empirical evidence concerning mental processes in the adult human, including attention, memory, language, and problem-solving. Prereq: Graduate standing in psychology, or consent of instructor.

PSY 629 INTRODUCTION TO CLINICAL PSYCHOLOGY. (2)
Offered jointly by the clinical faculty; covers the broad perspectives of clinical psychology, methods, history, ethics, and professional issues. Prereq: Enrollment in the graduate program in psychology.

PSY 630 CLINICAL METHODOLOGY I. (2)
An intensive survey and evaluation of tests of intelligence and objective methods of assessment of normal and abnormal personality. Special emphasis is given to major theoretical issues and relevant quantitative methods. Prereq: PSY 216, 532, 533, 535, or equivalent, and enrollment in graduate program in psychology.

PSY 631 PRACTICUM IN CLINICAL METHODOLOGY I. (2)
Clinical interviewing and practice in writing reports on behavioral observations, content of verbalization, and case history data. Practice in administration, scoring and interpretation of intelligence tests and objective personality tests. Laboratory, four hours. Prereq: PSY 532, 533, and 535, or the equivalent, and enrollment in the graduate program in clinical psychology. Prereq or concur: PSY 630.

PSY 632 CLINICAL METHODOLOGY II. (2)
Theoretical issues, quantitative methods and research findings on the projective methods of assessment of normal and abnormal personality. Prereq: PSY 630, and enrollment in graduate program in psychology.

PSY 633 PRACTICUM IN CLINICAL METHODOLOGY II. (2)
Practice in the administration and scoring of projective techniques and batteries of clinical tests. Laboratory, four hours. Prereq: PSY 630 and 631, and enrollment in graduate program in clinical psychology. Prereq or concur: PSY 632.

PSY 636 SYSTEMS OF PSYCHOTHERAPY. (3)
An intensive examination of the major theoretical and research approaches to therapeutic behavior change. Prereq: PSY 632 and 633, and enrollment in graduate program in clinical psychology.

*PSY 637 PRACTICUM IN PSYCHOLOGICAL ASSESSMENT AND INTERVENTION. (1-3)
Supervised experience in the techniques of psychological assessment and intervention with adults, children, families, and groups. Laboratory, two to six hours per week. May be repeated up to sixteen hours. Prereq: PSY 636 and enrollment in graduate program in clinical psychology.

PSY 638 DEVELOPMENTAL NEUROBIOLOGY. (3)
An explanation of the processes which contribute to the development of the nervous system. Neurophysiological, cell biological and molecular approaches to cell differentiation, neuronal pathfinding and synapse formation and stabilization will be explored and discussed. Examples will be drawn from both vertebrate and invertebrate preparations. Prereq: BIO 535 or consent of instructor. (Same as ANA/BIO/PGY 638.)

PSY 664 CULTURAL ISSUES IN MENTAL ILLNESS. (3)
An in-depth discussion of theory and method of the various approaches to cultural and social factors in the etiology, distribution, and treatment of mental illness. Data from non-Western and Western cultures are examined. Prereq: Enrollment in graduate program in anthropology, sociology, psychology, educational and counseling psychology, or consent of instructor. (Same as ANT/BSC 664.)

#PSY 708 INTERNSHIP IN CLINICAL PSYCHOLOGY. (0)
Full time practice in an APA-accredited internship setting, with on-site supervision provided by the internship setting and with academic supervision provided by the Director of Clinical Training at the University of Kentucky. May be repeated twice. Prereq: All course work in doctoral program in clinical psychology, approved dissertation proposal, and consent of Director of Clinical Training.

PSY 710 TOPICAL SEMINAR IN CLINICAL PSYCHOLOGY. (3)
A selected topics course designed to cover content areas which are not being met by the current faculty; may be taught by persons with special qualifications from the community or by existing faculty exploring new areas. The topics, which may be offered as the need arises, may include on a semester basis mental retardation, intensive psychoanalytic theory, psychopharmacology, etc. May be repeated to a maximum of six credits. Prereq: As specified by instructor.

PSY 748 MASTER'S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PSY 749 DISSERTATION RESEARCH. (0)
Half-time to full-time work on dissertation. May be repeated to a maximum of six semesters. Prereq: Registration for two full-time semesters of 769 residence credit following the successful completion of the qualifying exams.

PSY 767 TOPICAL SEMINAR IN BEHAVIORAL NEUROSCIENCE. (3)
A study of selected topics in behavioral neuroscience with emphasis on recent research and theory. May be repeated to a maximum of nine credits. Prereq: Consent of instructor. This course may be elected to fulfill requirements in the psychology and physiology graduate programs. (Same as PYS 767.)

PSY 768 RESIDENCE CREDIT FOR THE MASTER'S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.
PSY 769 RESIDENCE CREDIT FOR THE DOCTOR'S DEGREE. (0-12)
May be repeated indefinitely.

PSY 772 TOPICAL SEMINAR IN LEARNING. (3)
The study of selected topics in the learning area with emphasis on the recent experimental and theoretical literature. May be repeated to a maximum of six credits. Prereq: PSY 550 and consent of instructor.

PSY 776 SEMINAR IN DEPENDENCY BEHAVIOR. (3)
The course is designed to explore theories of dependency behavior by examining the concept of dependency as it can be applied to the study of various phenomena including alcohol use and abuse; dependence on other psychoactive substances; institutional dependency; dependency in work settings; and poverty and welfare. Prereq: Consent of instructor. (Same as ANT/SOC/BSC 776.)

PSY 778 TOPICAL SEMINAR IN DEVELOPMENTAL PSYCHOLOGY. (3)
An advanced seminar in selected topics in human development, including cognition, learning, language, personality, socialization, life span issues, and developmental aspects of psychopathology. Prereq: PSY 625 and enrollment in graduate psychology program, or consent of instructor. May be repeated a maximum of six credits.

PSY 779 TOPICAL SEMINAR IN SOCIAL PSYCHOLOGY. (3)
Each semester some topic in the field of social psychology, such as attitudes and beliefs, structures and function of social groups, social determinants of behavior, leadership, and morale will be studied intensively. May be repeated to a maximum of six credits. Prereq: PSY 444G. (Same as SOC 779.)

PSY 780 PROBLEMS IN PSYCHOLOGY. (1-3)
This number is used for topical seminars taught on an experimental basis or covering special material that may not be presented again. May be repeated to a maximum of six credits.

PSY 781 RESEARCH PARTICIPATION. (1)
Emphasis on the team approach to research. Designed primarily for first year graduate students. May be repeated to a maximum of four credits. Laboratory, two to four hours. Prereq: Enrollment in the graduate program in psychology.

PSY 790 RESEARCH IN PSYCHOLOGY. (1-12)
A minimum of three hours per credit a week is required on research conducted in consultation with the instructor. May be repeated as necessary with the approval of the Director of Graduate Studies.

PT 603 PHARMACOLOGY FOR PHYSICAL THERAPY STUDENTS. (1)
Fundamental concepts of pharmacology and their impact on the physical therapy management of patients. This course focuses on the integration of basic science, research, and clinical intervention. Prereq: Admission to the Physical Therapy Professional program and successful completion of the first year and seminar semesters in the first year.

PT 605 WELLNESS AND SPORTS NUTRITION. (3)
Emphasis is directed toward nutrition as applied to prevention of disease through lifestyle management and the application of nutrition in exercise and sport. Targeted focus areas are: body composition and energy expenditure, the metabolic basis of weight management, nutrient needs throughout the lifecycle, the metabolic changes associated with obesity, behavioral management of obesity, nutrient metabolism and exercise, water and electrolyte balance during exercise, nutritional ergogenic aids, nutrition-strength and performance enhancement. Prereq: PGY 412G, and BCH 401G or equivalent or consent of instructor. (Same as CUP/SC/BN 605.)

PT 610 ETHICS IN CLINICAL SCIENCES RESEARCH. (1)
Students will examine ethical issues in biomedical research using a case-study approach. Representative issues addressed may include data selection and retention, plagiarism, scientific review of grants and manuscripts, scientific misconduct, and informed consent. Prereq: Graduate student status. (Same as CUP/CS/BN 610.)

PT 625 ADVANCED ASSESSMENT AND MANAGEMENT OF THE PATIENT WITH MUSCULOSKELETAL DISORDERS. (3)
Assessment and management approaches will be presented. A treatment framework will be developed from assessment approaches. The student will utilize a problem solving approach to select and implement specific therapeutic interventions. Lecture, three hours; laboratory, two hours per week. Prereq: Admission to Physical Therapy and successful completion of the first year or consent of instructor.

PT 628 GERONTOLOGY FOR PHYSICAL THERAPY STUDENTS. (1)
This course is designed to provide the learner the fundamental concepts of aging which have a profound impact on the care of the geriatric patient. Concepts examined include the physiologic, medical, psychological, and behavioral changes which effect the physical therapy treatment of these patients. Students will conduct a clinical research project involving a geriatric clinic in the Lexington area. Prereq: Admission to the Physical Therapy Professional program and successful completion of the first year.

PT 645 RESEARCH AND MEASUREMENT IN PHYSICAL THERAPY. (3)
An analysis of various procedures and measuring instruments used in clinical practice and research in physical therapy. Emphasis is placed on the theory, application, and interpretation of the measurements in the evaluation of published materials. Basic statistical techniques and their appropriate use will be presented. Prereq: Admission to the Physical Therapy Professional program and to the Graduate School.

PT 650 DYSFUNCTION OF PERIPHERAL JOINTS. (3)
This course is an advanced approach to assessment and therapeutic management of musculoskeletal problems involving peripheral joints. Lecture, two hours; laboratory, two hours per week. Prereq: Consent of instructor.

PT 651 DYSFUNCTION OF VERTEBRAL JOINTS. (3)
This course concentrates on advanced theories and techniques of assessment and therapeutic management of musculoskeletal problems of the back. Lecture, two hours; laboratory, two hours per week. Prereq: Consent of instructor.

PT 652 PATHOMECHANICS. (3)
An application and research oriented investigation into the science of abnormal human movement. The course involves the pathologic aspects of neural control, muscle contraction, assessment and motion analysis, joint mechanics, and noncontractile tissue as they relate to human movement and kinetics. Lecture, two hours; laboratory, two hours per week. Prereq: HPR 515 or consent of instructor.

PT 654 MECHANISMS OF MOTOR CONTROL. (3)
This advanced course explores current knowledge regarding the neurophysiological mechanisms involved in motor control. Prereq: Consent of instructor.

PT 655 NEUROMOTOR DEVELOPMENT. (3)
This is an advanced course on normal neuromotor development and the deviations from normal with emphasis on the infant. Prereq: Consent of instructor.

PT 660 ADVANCED CLINICAL PRACTICUM IN PHYSICAL THERAPY. (1-6)
Provides advanced supervised clinical experience appropriate to student’s level of preparation in specialty. Forty to sixty clinical hours for one credit hour. May be repeated to a maximum of six credits. Prereq: Graduate standing and permission of instructor.

PT 668 RESEARCH PROBLEMS. (2-3)
This course is intended to introduce the student to methods of analyzing data and problems of writing a scientific paper for publication. Students are required to collect and analyze data as it relates to their research problems. Also required is an oral presentation of their finished manuscript. Prereq: Admission to the Physical Therapy Professional program and successful completion of the second year.

PT 676 ELECTROPHYSIOLOGICAL TESTING AND THERAPEUTICS. (2)
The student is introduced to the principles of electricity, how it affects the muscle and nerve, its use in physical therapy for patient assessment and management, and its safety aspects. Lectures and laboratory exercises are included. Prereq: Admission to the Physical Therapy Professional program and successful completion of the first year.

PT 686 SPECIALTY ELECTIVES. (2-4)
Introduction to emerging specialty areas within the physical therapy profession. Students will select multiple specialty areas under faculty direction. Prereq: Admission to the Physical Therapy Professional program and successful completion of the first year or consent of instructor.
PT 695 INDEPENDENT STUDY IN PHYSICAL THERAPY. (1-3)
Independent work devoted to specific problems or area of interest in physical therapy. Work to be supervised by a graduate faculty member proficient in the area under study. May be repeated to a maximum of six credits. Prereq: Consent of instructor.

PT 748 MASTER’S THESIS RESEARCH. (0)
Half-time to full-time work on thesis. May be repeated to a maximum of six semesters. Prereq: All course work toward the degree must be completed.

PT 768 RESIDENCE CREDIT FOR THE MASTER’S DEGREE. (1-6)
May be repeated to a maximum of 12 hours.

PT 770 SEMINAR IN PHYSICAL THERAPY. (3)
Each semester a contemporary topic in the field of physical therapy will be studied intensively. Lecture, two to three hours per week; laboratory, zero to two hours per week. May be repeated to a maximum of nine credits.

PT 805 NORMAL FUNCTIONAL ANATOMY. (3)
A regional study of the normal functional aspects of the neuromusculoskeletal systems, including the basic principles of biomechanics and human locomotion. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year of the professional program.

*PT 815 BASIC CLINIC SKILLS. (5)
Theory, techniques, rationale, physiological effects, and indications of basic physical therapeutic procedures of electromodalities, hydrotherapy and massage, thermal therapy, cryotherapy, muscle testing and goniometry evaluations, gait analysis and muscle function are presented in lecture. Techniques are demonstrated and practiced in laboratory. This course runs during the entire 12-week summer term. Lecture, forty hours; laboratory, one hundred hours for twelve weeks. Prereq: Admission to the Physical Therapy Professional program and successful completion of the spring semester (first year of the professional program).

PT 821 ASSESSMENT AND MANAGEMENT OF PATIENTS WITH ACUTE CARE DISORDERS. (2)
The theoretical and clinical framework for physical therapy assessment and management of patients with acute care disorders, emphasizing those of the integumentary system, (i.e., wounds, burns, etc.) are discussed. These injuries will include open wounds as well as burns and their implications to the integumentary system. The student will utilize a problem solving approach to select and implement tests and measurements as well as therapeutic interventions. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

#PT 825 PROSTHETICS. (2)
This course will prepare the student to perform physical therapy evaluation and provide patient management as part of a prosthetic team. Lecture, 18 hours; laboratory, 34 hours. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

*PT 826 ORTHOTICS. (2)
This course will prepare the student to perform physical therapy evaluation and provide patient management as part of a prosthetic or orthotic team. Lecture, 18 hours; laboratory, 30 hours. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 827 SPINAL CORD REHABILITATION TECHNIQUES. (2)
Prepare the student as a participating member of the rehabilitation team with an emphasis on the role of the physical therapist. Patient evaluation, physical restoration, and vocational counseling for a variety of long-term illnesses are presented, discussed, demonstrated, and clinical techniques practiced. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 831 CLINICAL NEUROPHYSIOLOGY. (2)
The study of the regional organization of the brain and spinal cord, the ways in which they connect and how these connectivities influence human behavior with emphasis on motor behavior. The effect of disease states on normal brain and spinal cord function will be discussed. Prereq: Admission to the Physical Therapy professional program and successful completion of the spring and summer semesters in the first year.

PT 834 INTRODUCTION TO PHYSICAL THERAPY AND BIOETHICS. (3)
An orientation to the profession of physical therapy including history, professional organization, role in health care, elementary patient care skills, use of the medical library and professional documentation. Bioethics will be introduced in relationship to moral issues in health care. Prereq: Admission to the Physical Therapy professional program.

PT 835 CLINICAL CLERKSHIP I. (1)
The student observes patient treatment by experienced staff members and is supervised in the performance of elementary procedures involved in patient care. Offered on a pass/fail basis only. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the spring semester (first year of the professional program).

PT 836 CLINICAL CLERKSHIP IA. (2)
Continuation of PT 835 progressing students from performance of basic skills under close supervision to performance of those skills with more independence and adding more opportunities for evaluation and treatment experiences. Offered on a Pass/Fail basis only. Clinic, 40 hours per week for three weeks. Prereq: Admission to the Physical Therapy professional program and successful completion of the spring, summer and didactic portion of the fall semester (first year of the professional program).

PT 837 CLINICAL CLERKSHIP II. (3)
Under competent supervision, students participate clinically in the care of patients in a variety of extramural facilities: general, children’s and Veteran’s Administration hospitals, and special outpatient facilities. Offered on a pass/fail basis. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 838 CLINICAL CLERKSHIP III. (3)
Continuation of PT 837 includes a unit of study planning and coordination of hospital and community services in comprehensive care of patients by way of seminars and case presentations. Offered on a pass/fail basis only. Clinic, 170 hours. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 839 CLINICAL INTERNSHIP IN PHYSICAL THERAPY. (9-16)
Supervised internship through which the student acquires understanding and skill in physical therapy procedures. Offered on a pass/fail basis. Sixty clock hours equal one credit hour. Prereq: Admission to the Physical Therapy professional program and successful completion of the second year.

PT 846 MEDICAL AND PHYSICAL THERAPY MANAGEMENT OF ORTHOPEDIC PROBLEMS. (3)
An introduction to medical procedures, including history, physical exam, laboratory data, radiographic film and medical and physical therapy management of orthopedic problems, including fractures, soft tissue injuries, scoliosis, joint replacements, muscle transplants and tendon repairs, will be presented. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 847 MEDICAL AND PHYSICAL THERAPY MANAGEMENT OF NEUROLOGICAL PROBLEMS. (3)
Medical and physical therapy management of neurological problems, including the neurological examination, seizures, degenerative and neurological diseases, will be presented. Lecture/laboratory, patient contact, and case study formats will be used. Lecture, two hours; laboratory, two hours. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 854 BIOLOGY OF DISEASE. (3)
A study of the concept and process of disease. May be repeated for a total of five credits. Prereq: Admission to the Physical Therapy professional program and successful completion of the spring and summer semesters (first year of professional program). (Same as HSE 854.)

PT 856 THERAPEUTIC EXERCISE I. (2)
This introductory course provides an overview of therapeutic exercise and its relation to patient management, and development of skill in basic therapeutic exercise approaches for improving muscle performance, relaxation and mobilization. Lecture and laboratory sessions are included. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the spring semester in the first year.

PT 858 ADVANCED ASSESSMENT AND MANAGEMENT OF THE PEDIATRIC PATIENT. (3)
Includes the normal and abnormal development of movement and its relation to treatment of children with central nervous system deficits. Medical and physical therapy management of patients with mental retardation and oral control problems are also presented in lecture and laboratory. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

†PT 866 ELECTROMODALITIES.
PT 877 CARDIO-RESPIRATORY THERAPY. (2)
A combined lecture, laboratory series dealing with the mechanics and physiology of normal cardio-respiratory functions; medical and surgical pathologies; and physical theory evaluation and treatment techniques for respiratory problems, cardiac arrhythmias, myocardial infarction rehabilitation, and various cardiac stress tests. Prereq: Admission to the Physical Therapy Professional program and successful completion of the first year.

PT 887 INTRODUCTION TO PHYSICAL THERAPY MANAGEMENT. (1)
An introduction to basic management techniques including purpose, goals and objectives; contracts, task statement and analysis; position descriptions; medicaid; quality assurance; placement services. This course runs during the entire 12-week summer term. Prereq: Admission to the Physical Therapy professional program and successful completion of the first year.

PT 888 ADVANCED PHYSICAL THERAPY MANAGEMENT. (3)
Emphasis is placed on operational aspects of physical therapy department including relationship to total facility operation, designing and equipping a department, contracts, salaries, fees, personnel policies, records, data processing, budget process, medical-legal implication, continuing education, and the consultative process. Prereq: PT 887 or consent of instructor.

PT 898 INDEPENDENT STUDY. (1-4)
The student will pursue in-depth a particular aspect of physical therapy or related fields. May be repeated to a maximum of four credits. Prereq: Consent of instructor.