PHARMACOLOGY AND TOXICOLOGY (PHTX)

PHTX 400. Drugs and Their Actions. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with junior or senior standing, or permission of instructor. This course covers basic principles of pharmacology and pharmacodynamics, including the mechanisms of drug action, drug interactions, and drug classifications. Topics include drug metabolism, drug disposition, and clinical applications of pharmacology.

PHTX 535. Introduction to Toxicology. 4 Hours.
Semester course; 4 lecture hours. 4 credits. The basic principles of toxicology and toxicological evaluations; correlations of toxicological responses with biochemical, functional, and morphological changes; environmental (including occupational and public health), forensic and regulatory concerns; and risk assessment and management are presented.

PHTX 548. Drug Dependence. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students with graduate or post-baccalaureate standing or with permission of instructor. This course covers the pharmacology and therapies for drug dependence, including opioid, nicotine, and alcohol dependence. The course also covers the role of genetics and environment in drug addiction.

PHTX 597. Introduction to Pharmacological Research. 1-12 Hours.
Semester course; 1-12 credits. Prerequisite: permission of instructor. This course provides an introduction to research methods in pharmacology and toxicology and the design of pharmacological experiments.

PHTX 606. Introduction to Pharmacology of Therapeutic Agents. 1 Hour.
Module course; 1 lecture hour. 1 credit. The basic principles of pharmacology and the role of drugs in disease prevention and treatment are covered.

PHTX 614. Foundation in Psychoneuroimmunology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: at least one graduate-level course in immunocompetence, pharmacology, physiology, immunology, biochemistry or psychology, or permission of instructor. This course covers the fundamental biophysical properties of ionic channels in membranes and the role of these neurochemical systems as pharmacological targets.

PHTX 620. Ion Channels in Membranes. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Previous course work including basic concepts in electrophysiology, such as those covered in PHIS 501 or PHTX/PHIS/ANAT 509, is highly recommended. Detailed presentation of the fundamental biophysical properties of ionic channels in membranes including the elementary properties of pores, molecular mechanisms of ionic selectivity, mechanisms of drug block, structure-function relationships, and basis for channel gating.

PHTX 625. Cell Signaling and Growth Control. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 536 or consent of instructor. Covers biochemical and molecular biology approaches to pharmacological problems. Emphasizes signal transduction, oncogenes, protein kinases, stress responses, and the control of cellular proliferation.

PHTX 630. Basic Concepts in Pharmacology for Graduate Students. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: BIOC 503 or permission of instructor. This course covers basic concepts in pharmacology and toxicology.

PHTX 632. Neurochemical Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 630, PHTX 636, BIOC 503, BIOC 504, NEUS 609 or MEDC 555, or permission of instructor. Course focuses on neurotransmitters, transporters, and receptors and intracellular signaling pathways that mediate chemical neurotransmission in the nervous system, with a secondary focus on the role of these neurochemical systems as pharmacological targets.

PHTX 633. Behavioral Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 630, PHTX 636 or permission of instructor and graduate program director. Corequisite: PHTX 639. A comprehensive course in pharmacology for graduate students. The mechanisms of action of major classes of pharmacologically active agents and basic principles of pharmacology are discussed. Topics include autonomic and cardiovascular pharmacology, CNS pharmacology, pharmacology of antimicrobials and cancer, gastrointestinal and endocrine pharmacology.
PHTX 638. Cellular Mechanisms of Toxicology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisite: PHTX 536 or permission of instructor. A holistic approach is taken to describe and analyze toxicological information. Intact animal, organ, cellular, and biochemical responses to toxic agents are presented. Immunologic, genetic, endocrine, and central nervous system paradigms and their relationship to the mechanism of action of toxic agents as well as the predictive value of tests of these systems are presented. Kinetics and metabolism of toxic agents as well as statistical and analytical procedures are integrated into the discussions.

PHTX 639. Principles of Pharmacology Journal Club. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Prerequisite: PHTX 630 or permission of instructor. Corequisite: PHTX 636. This course will be in journal club format run in parallel with PHTX 636. Journal club articles pertaining to drug classes and their mechanism of action will be presented by students. Topics include autonomic, CNS, endocrine, cardiovascular and cancer pharmacology.

PHTX 640. Pharmacology of Analgesics. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Prerequisites: PHTX 630 and PHTX 636 or permission of the instructor. The course will be divided into three sections. In the first, students will review methods for measurement of pain and analgesia in humans and animals and describe the implications of these measures for translational pain research. In the second section, students will review the neurobiology of pain, with a focus on neural systems that mediate sensory and affective dimensions of pain and their modulation by endogenous pain inhibitory systems. In the final section, students will review the pharmacology of existing classes of drugs and the research strategies for evaluation of new candidate analgesics. Throughout the class, readings and discussions will consider both seminal literature and recent research papers.

PHTX 641. Introduction to Clinical Pharmacology. 3 Hours.
Semester course; 3 lecture hours. 3 credits. Enrollment is restricted to students who have completed a post-baccalaureate degree or an undergraduate physiology degree or by permission of the instructor. This course is a general survey of clinical pharmacology designed for students pursuing professional degrees including dental, medical and pharmacy programs. The basic principles of pharmacokinetics, pharmacodynamics and pharmacogenetics are presented followed by discussions of neuropharmacology, including drugs for treating neurological disorders and drugs of abuse; immunopharmacology and drugs for pain management; systems pharmacology including autonomic, cardiovascular, respiratory, renal, GI and endocrine pharmacology; and drugs targeting infectious diseases and cancer chemotherapy.

PHTX 644. Forensic Toxicology. 3 Hours.
Semester course; 2 lecture and 2 laboratory hours. 3 credits. Lecture and demonstrations in which common poisons and groups of poisons are discussed as to detection, diagnosis and treatment of poisoning. Demonstrations include basic principles of analytical toxicology, forensic science and courtroom testimony. Crosslisted as: FRSC 644.

PHTX 690. Pharmacology Research Seminar. 1 Hour.
Semester course; 1 lecture hour. 1 credit. Members of the departmental staff, students, and visiting lecturers participate in discussions on topics of current and historical interest.

PHTX 691. Special Topics in Pharmacology. 1-4 Hours.
Semester course; 1-4 credits. Prerequisite: permission of instructor. Special topics in pharmacology or toxicology covered in less detail in other courses will be studied in depth in this course.

PHTX 692. Special Topics. 1-4 Hours.
Semester course; 1-4 variable hours. 1-4 credits. Lectures, tutorial studies, library assignments in selected areas of advanced study or specialized laboratory procedures not available in other courses or as part of the research training. Graded as S/U/F.

PHTX 697. Directed Research in Pharmacology. 1-15 Hours.
Semester course; 1-15 credits. Research leading to the M.S. or Ph.D. degree and elective projects for other students.