

826. Laboratory Animal Pathology
Spring. 4(3-3) Graduate status and approval of department.

Macro and microscopic studies on the diseases of laboratory animals with special emphasis on naturally-occurring diseases which might interfere with the interpretation of experimental results.

899. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

910. Biology of Disease
Fall. 3(2-3) Approval of department. Primarily for students in the biological sciences.
Basic morphologic changes in disease with emphasis on the related physiologic pathology. Laboratory includes relevant problems in post-mortem diagnosis.

921. Pathology of Nutritional and Metabolic Diseases
Summer of even-numbered years. 4(3-2) Approval of department; PTH 404 or ANT 420. ANS 525, BCH 452, HNF 462 recommended. Interdepartmental with the departments of Large Animal Surgery and Medicine and Animal Husbandry and Human Nutrition and Foods. Administered by Human Nutrition and Foods.
Development, physiopathology and morphologic pathology of nutritional and metabolic diseases including carbohydrate, protein, fatty acid, vitamin and mineral deficiencies, their experimental induction and their medical or economic significance.

980. Histopathologic Diagnosis
Fall, Winter, Spring, Summer. 3(0-9) May reenroll for a maximum of 6 credits. PTH 803, PTH 820.

Trimming, histopathologic examination, description, diagnosis and reporting of specimens from biopsy and necropsy.

990. Advanced Correlative Pathology
Fall, Winter, Spring, Summer. 5(0-15) May reenroll for a maximum of 15 credits. Approval of department.

Experience in morphologic and clinical pathology and correlation of these with the clinical aspects of disease.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

PHARMACOLOGY AND TOXICOLOGY PHM

(Effective July 1, 1978. Formerly Department of Pharmacology)

**College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine**

350. Introductory Human Pharmacology
Spring. 3(3-0) PSL 432 or PSL 241 or concurrently; or approval of department.

General principles; central nervous system, autonomic nervous system, cardiovascular and renal drugs; chemotherapy; and other selected basic topics.

430. Drug Abuse
Fall of odd-numbered years. 4(4-0) Juniors or approval of department. Biology and chemistry recommended.

Actions, mechanism of action, toxicity and uses of drugs of abuse. Sociological and psychological aspects of drug abuse and the legal aspects of the sale and distribution of drugs are considered.

480. Special Problems
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.

Limited amounts of individual work on selected research problems for undergraduate students.

520A. Principles of Pharmacology
Fall. 4(4-0) PSL 500B, PSL 500C.

Drug absorption, distribution, biotransformation, elimination, antagonism; receptor theory and pharmacogenetics; adverse drug reactions, chemical toxicity. Chemotherapy: antimicrobials, antihelminthics, antineoplastics. Pharmacology related to the autonomic nervous system.

520B. Principles of Pharmacology
Winter. 4(4-0) PSL 500A; BCH 501.

Drug absorption, distribution, biotransformation, elimination, antagonism; receptor theory and pharmacogenetics. Chemotherapy: antineoplastic, antiviral and antimicrobial agents. Toxicology and emergency therapies. Pharmacology related to the autonomic nervous system.

521A. Pharmacodynamics
Winter. 5(4-2) PHM 520A or PHM 520B. Primarily for students of Veterinary Medicine.

Pharmacology of drugs that affect the heart, kidney, central nervous system and nonvascular smooth muscle as related to veterinary medicine. Endocrine and autocoid pharmacology.

521B. Pharmacodynamics
Spring. 4(4-0) PHM 520B or PHM 520A.

Pharmacology of the central and peripheral nervous systems. Cardiovascular, renal and gastrointestinal drugs. Endocrine and autoacid pharmacology.

810. Synaptic Transmission
Winter of odd-numbered years. 4(4-0) Approval of department.

Chemical and electrical aspects of nervous impulse transmission at synaptic and neuroeffector junctions and influences of drugs upon these processes. Intrinsic neuronal circuitry; reticular formation; thalamus; neocortex; cerebellum.

811. Advanced Renal and Autocoid Pharmacology
Spring of even-numbered years. 4(4-0) PHM 521A or PHM 521B and approval of department.

Advanced concepts and current topics in renal and autocoid pharmacology.

812. Advanced Principles of Pharmacology and Toxicology
Spring of odd-numbered years. 5(5-0) PHM 521A or PHM 521B, approval of department.

Kinetics of drug absorption, elimination and metabolism; drug receptor interactions, toxicology of metals and pesticides, industrial and inhalation toxicology; developmental toxicology, teratogenesis, mutagenesis and carcinogenesis. New drug development.

813. Cardiac Pharmacology
Winter of even-numbered years. 4(4-0) PHM 520A, PHM 521A or PHM 520B, PHM 521B; PSL 801, PSL 802, PSL 803; and approval of department.

Effects of drugs on normal physiological and biochemical processes in cardiac cells are studied. Emphasis is placed on mechanisms of drug action.

870. Problems
Fall, Winter, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 12 credits. Approval of department.

Limited amounts of individual work on selected research problems for first year graduate students in the Department of Pharmacology and Toxicology.

899. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Individual work on research problems for the master's degree in pharmacology.

910. Seminar
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 3 credits. Approval of department.

Discussion of recent topics on pharmacology by departmental or outside speakers, or reporting of research efforts by graduate students of the Department of Pharmacology and Toxicology.

980. Problems
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 20 credits. Approval of department.

Limited work on selected research problems.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Individual work on research problems for the doctoral degree in pharmacology.

PHILOSOPHY PHL

College of Arts and Letters

Each of the courses PHL 101, PHL 102, PHL 103 is an independent gateway to an area of philosophy. Together they provide a comprehensive introduction to philosophical inquiry through contact with philosophical issues.

101. Introduction to Philosophy: Ethics and Value
Fall, Winter, Spring, Summer. 3(3-0) Students may not receive credit for both PHL 101 and PHL 330.

Moral responsibility, praise and blame, good and evil, justice, law and morality, individual liberty and collective authority and contemporary moral issues are typical problems.

102. Introduction to Philosophy: Epistemology and Metaphysics
Fall, Winter, Spring, Summer. 3(3-0)

Skepticism and certainty, existence, matter and mind, God, space and time, knowledge and belief, perception, personal identity, causality, and free-will are typical problems.