848. Recreation Resource Law  
Spring. 3(2-0)  
Legal basis for public recreation. Methods of acquiring recreational resources, including contracts and condemnation procedures. Administrative problems, including zoning, liability, civil rights and law enforcement. Study of cases and statutes.

850. Development of Water Recreation Resources  
Spring. 3(3-0) Approval of department.  
Administration, research, design, and construction of water recreation facilities. Policy issues, use conflict, and final planning reviewed in light of interagency relationship and legislative mandate.

880. Special Problems  
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 10 credits. Approval of department.  
Seminars on current problems. Supervised readings. Independent study of selected topics.

882. Recreation Research Seminar  
Fall, Winter. 2(2-0) May re-enroll for a maximum of 4 credits. Approval of department.  
Evaluation of a variety of studies presented by the scientists to illustrate how principles are applied to recreation research project management.

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

PATHOLOGY  

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

404. General Pathology  
Fall. 5(3-6) ANT 420, Junior Medical Technology majors, or approval of department.

407. Clinical Pathology  
Winter, Spring. 3 or 5 credits. 404 or approval of department.  
Theory and technics in hematology, coagulation, blood banking, clinical microbiology and chemical pathology, including urinalysis, blood chemistry and continuous flow analysis.

408. Clinical Pathology  
Winter, Spring. 3 or 5 credits. 404 or approval of department.  
Continuation of 407.

502. Human Pathology I  
Winter. 2(2-0) Second term medical students or approval of department.  
Pathologic processes and specific disease syndromes with emphasis on clinical applications. Concepts of disease and pathologic process in selected common diseases or conditions for the beginning medical student with a limited knowledge of anatomy, physiology and biochemistry.

503. Human Pathology II  
Spring. 3(2-2) 502 or approval of department.  
A study of pathology in which general pathology, system pathology and laboratory diagnoses are combined in a system-oriented sequence. The first four weeks are devoted to hematopathology, the remaining six to neuropahtology.

504. Human Pathology III  
Fall. 3(2-2) 503 or approval of department.  
A continuation of PTH 503. Diseases of the cardiovascular system, including stress effects, arteriosclerosis and disorders of autonomic and endocrine regulation. Laboratory sections include the study of histologic sections.

505. Human Pathology IV  
Winter. 3(2-2) 504 or approval of department.  
A continuation of PTH 504. The systems include: lung, kidney, male genitourinary and bone and joint. In the laboratory sections, gross and microscopic changes in diseased tissues are studied and correlated with lecture material. Separate lab sessions covering pulmonary function tests, acid-base balance and urinalysis are included.

506. Human Pathology V  
Spring. 3(2-2) 505 or approval of department.  
A continuation of PTH 505. The systems include gastrointestinal tract (including liver and pancreas), female reproductive tract and breast.

507. Veterinary Pathology I  
Spring. 6(3-6) Admission to the professional veterinary program, or approval of department.  
Principles of pathology, including causes of disease, disturbances of cell growth and metabolism, nutrition, circulatory changes, inflammation and neoplasms; introduction to clinical hematology.

508. Pathology Clerkship  
Fall, Winter, Spring, Summer. 3 to 17 credits. May re-enroll for a maximum of 17 credits. II M 622 or approval of department.  
Anatomical and clinical pathology, with emphasis on clinical-pathological correlations. Conducted in the pathology departments of affiliated hospitals.

602. Microscopy I  
Winter, Spring, Summer. 7(4-8) 500.  
Continuation of PTH 550, with coverage of the hematopoietic, cardiovascular, urinary, digestive, respiratory and reproductive systems; integration of principles of clinical pathology.

603. Pathology Seminar  
Fall, Winter, Spring, Summer. Variable credit. Approval of department.  
Seminars required of all majors in Pathology.

604. Advanced Histopathology  
Fall. 5(6-0) Approval of department.  
A relatively advanced and comprehensive study in the histopathologic aspects of systemic and special pathology; independent study in the field of pathogenesis and microscopic pathology.

605. Advanced Histopathology  
Winter. 5(6-0) 802 and approval of department.  
Continuation of 802.

606. Pathology Proseminar  
Fall. 2(2-0) Approval of department.  
Philosophy and methods of research; theses and research reports; literature review; interpretation of research data; practical assignments.

610. Veterinary Clinical Pathology  
Fall, Spring. 3(2-2) M 420.  
Laboratory procedures in the diagnosis and prognosis of animal disease; examination of body tissues, fluids and excreta.

611. Advanced Clinical Pathology  
Winter. 3(4-0) Approval of department.  
Application of standard and newer technics and instrumentation in hematology, biochemistry, parasitology, etc., to the diagnosis of disease.

612. Hematology  
Winter. 5(4-4) 406 or 610 or approval of department.  
Pathology of diseases of blood and an analysis of diagnostic laboratory procedures.

620. Oncology  
Spring. 3(3-0) Approval of department.  
A study of benign and malignant neoplasms with emphasis on gross and microscopic characteristics and diagnosis.
826. Laboratory Animal Pathology
Spring. (4-3-2) Graduate status and approval of department. Interdepartmental with and administered by Laboratory Animal Resources.
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.

980. Histopathologic Diagnosis
Fall, Winter, Spring, Summer. (3-0-3) May re-enroll for a maximum of 6 credits. 893, 890.
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 re-enroll 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 PHM

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

350. Introductory Human Pharmacology
Spring. (3-0) PSL 332 or concurrently, or approval of department.
Survey of pharmacology including general principles, central nervous system drugs, autonomic nervous system drugs, cardiovascular and renal drugs, endocrine drugs, anti-infectives, poisoning therapy, and other basic related topics.

430. Drug Abuse
Fall, Spring. (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.

450. Special Problems
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 5 credits. Approval of department.

520A. Principles of Pharmacology
(Fall) 4(4-0) PSL 500B, 500C. Primarily for students of Veterinary Medicine.
Pharmacology principles, including absorption, distribution, biotransformation, drug antagonism, receptor theory and pharmacogenetics; literature data analysis; adverse drug reactions. Chemotherapy including anti-neoplastic, anti-viral and anti-microbial agents; endocrine and emergency therapies.

520B. Principles of Pharmacology
(Winter) 4(4-0) PSL 500A, or 801, 802, 803. Primarily for students of Human and Osteopathic Medicine.
Pharmacology principles, including absorption, distribution, biotransformation, drug antagonism, receptor theory and pharmacogenetics; literature data analysis; adverse drug reactions. Chemotherapy including anti-neoplastic, anti-viral and anti-microbial agents; endocrine and emergency therapies.

520C. Principles of Pharmacology—Independent Study
Summer. 1(1-0) Approval of department. Primarily for students of Human and Osteopathic Medicine.
Independent study of pharmacology principles, including absorption, distribution, biotransformation, drug antagonism, receptor theory and pharmacogenetics; literature data analysis; adverse drug reactions. Chemotherapy including anti-neoplastic, anti-viral and anti-microbial agents; endocrine and emergency therapies.

521A. Pharmacodynamics
(Fall) 821. Winter. 5(4-4) 520A. Primarily for students of Veterinary Medicine.
Pharmacology of the nervous systems (central, peripheral and autonomic); cardiovascular, renal, gastrointestinal drugs.

521B. Pharmacodynamics
Spring. 4(4-0) 520B. Primarily for students of Human and Osteopathic Medicine.
Pharmacology of the nervous systems (central, peripheral and autonomic); cardiovascular, renal, gastrointestinal drugs.

521C. Pharmacodynamics—Independent Study
Summer. 3(1-1) 520B or 520C. Primarily for students of Human and Osteopathic Medicine.
Independent study of pharmacology of the nervous systems (central, peripheral and autonomic); cardiovascular, renal, gastrointestinal drugs.

522. Toxicology
Spring. 3(0-0) 521A or 521B or 521C.
Toxicology of economic and household poisons, toxic gases and vapors, minerals solvents, pesticides and pollutants.

810. Sympathetic Transmission
Winter of odd-numbered years. 4(4-0) Approval of department.
Chemical and electrical aspects of the transmission of nerve impulses at sympathetic and neuroeffector junctions and the influences of drugs upon these processes.

811. Organ System Pharmacology
Fall of odd-numbered years. (4-3-3) 521A or 521B or 521C and approval of department.
Current concepts and recent advances in the areas of cardiovascular, renal and sympathetic smooth muscle pharmacology.

812. Advanced Principles of Pharmacology and Toxicology
Spring of odd-numbered years. 4(4-0) 522 and approval of department.
Kinetics of drug absorption, elimination and metabolism; drug-receptor interaction. Principles of drug toxicity in evaluation and treatment; includes problems of modern toxicology, i.e., teratogenesis, mutagenesis, carcinogenesis.

870. Problems
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 5 credits. Approval of department. Limited amounts of individual work on selected research problems.

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

910. Seminar
Fall, Winter, Spring. 1(1-0) May re-enroll for a maximum of 3 credits.

990. Problems
Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 5 credits. Approval of department. Limited amounts of individual work on selected research problems.

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

PHILOSOPHY PHL

College of Arts and Letters

Each of the courses 101, 102, 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 101 and 340.
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.

103. Introduction to Philosophy: Logic
Fall, Winter, Spring. Summer. 3(3-0)
Deductive and inductive reasoning and such topics as rational argumentation, fallacies, definition, meaning, truth and evidence.

200H. Honors Work
Fall, Winter, Spring. 1 to 16 credits. Approval of department.