

**846. Urban Recreation Area and Program Analysis**  
 Spring. 4(4-0) Approval of department.

Analysis of urban public, private and commercial recreation areas, facilities, and programs. Construction of a typology of urban communities. Course is conducted in selected urban communities in Michigan.

**848. Recreation Resource Law**  
 Spring. 3(3-0)

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 fiscal 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.

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 diagnosis are combined in a system-oriented sequence. The first four weeks are devoted to hematology, the remaining six to neuropathology.

**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 sessions 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 joints. 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.

**550. 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, necrosis, circulatory changes, inflammation and neoplasms; introduction to clinical hematology.

**560. Pathology II**

Winter, Summer. 7(4-8) 550.

Continuation of 550, with coverage of the hematopoietic, cardiovascular, urinary, digestive, respiratory and reproductive systems; integration of principles of clinical pathology.

**608. Pathology Clerkship**

Fall, Winter, Spring, Summer. 3 to 17 credits. May re-enroll for a maximum of 17 credits. H M 602 or approval of department.

Anatomic and clinical pathology, with emphasis on clinical-pathological correlations. Conducted in the pathology departments of affiliated hospitals.

**610. Veterinary Clinical Pathology**

Fall, Spring. 3(2-3) 560.

Laboratory procedures in the diagnosis and prognosis of animal disease; examination of body tissues, fluids and excreta.

**615. Diseases of Poultry**

Winter, Summer. 4(4-0) Eighth-term Veterinary Medicine students.

Etiology, signs, lesions, differential diagnosis and control of infectious and noninfectious diseases of birds, with emphasis on domestic poultry.

**620. Human Pathology I**

Fall. 5(4-2) Medical school Sophomores or approval of department.

Recognition and classification of gross and microscopic structural changes in disease, analysis of functional consequences, and correlation with clinical manifestations.

**621. Human Pathology II**

Winter. 5(4-2) 620.

Continuation of 620.

**622. Principles of Laboratory Medicine**

Spring. 5(4-2) 621.

Study of diseases, the diagnosis and management of which rely on laboratory methods; hemologic, endocrine, metabolic, and infectious diseases are included.

**800. Problems in Pathology**

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

Elective work for students in veterinary medicine interested in pathology as a speciality, or in the special pathology of diseases of a particular class or species, and for graduate minors and majors interested in pathological techniques or in non-thesis research.

**801. Pathology Seminar**

Fall, Winter, Spring, Summer. 1(1-0)

May re-enroll for a maximum of 3 credits for M.S. candidates and 6 credits for Ph.D. candidates. Approval of department.

Seminar required of all majors in Pathology.

**802. 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.

**803. Advanced Histopathology**

Winter. 5(6-0) 802 and approval of department.

Continuation of 802.

**804. Histopathologic Techniques**

Fall. 3(1-6) Approval of department.

Theory and practice in preparation of tissues for examination with the light microscope; special stains and histochemical procedures included.

**805. Pathology Proseminar**

Fall. 2(2-0) Approval of department.

Philosophy and methods of research; theses and other research reports; literature review; illustration of research data; practical assignments.

**810. Post-Mortem Diagnosis**

Winter, Summer. 3(0-9) May re-enroll for a maximum of 6 credits. Approval of department. Required of majors.

Instruction and practice in diagnosis of animal diseases by means of necropsy and other laboratory techniques. Emphasis will be placed upon correlation and interpretation of gross and microscopic lesions and the results of other tests.

**811. Advanced Clinical Pathology**

Winter. 3(1-6) Approval of department.

Application of standard and newer techniques and instrumentations in hematology, biochemistry, parasitology, etc., to the diagnosis of disease.

**812. Hematology**

Winter. 5(3-4) 408 or 610 or approval of department.

Pathology of diseases of blood and an analysis of diagnostic laboratory procedures.

## **PATHOLOGY**

## **PTH**

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. 5(3-4) 404 or approval of department.

Theory and technics in hematology, coagulation, blood banking, clinical microscopy and chemical pathology, including urinalysis, blood chemistry and continuous flow analysis.

**408. Clinical Pathology**

Spring. 5(3-4) 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.

**820. Oncology**  
Spring. 3(6-0) 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(3-3) 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(0-9) May re-enroll for a maximum of 6 credits. 803, 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 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(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. 3(3-0) 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. Variable credit. May re-enroll for a maximum of 5 credits. Approval of department.

**520A. Principles of Pharmacology**  
(520.) Fall. 4(4-0) PSL 502. 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 502. 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. 4(1-9) 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**  
(521.) 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. 5(1-11) 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(3-0) 521.

Toxicology of economic and household poisons, noxious gases and vapors, minerals solvents, pesticides and pollutants.

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

Chemical and electrical aspects of the transmission of nervous impulses at synaptic and neuroeffector junctions and the influences of drugs upon these processes.

**811. Organ System Pharmacology**  
Fall of odd-numbered years. 4(3-3) 521 and approval of department.

Current concepts and recent advances in the areas of cardiovascular, renal and syncytial 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 the 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.

**980. 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 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.

**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.

**211. Introduction to the History of Philosophy, Part I**  
Fall, Winter, Spring. 3(3-0)

The Greek and Roman period with emphasis on Plato and Aristotle.