

**844. Recreation Research Methods**  
Winter. 4(4-0) Approval of department.

Relate recreation research to broader context of social scientific investigation and to the nature and philosophy of social scientific research. Examine the theoretical and methodological approaches in recreation research.

**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**  
Winter. 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.

Advanced work for non-thesis projects or advanced individual study in recreation: policy, land use, planning, systems administration and management, economics, recreation forestry, commercial recreation enterprises, recreation and social problems, environmental interpretation, travel and touring, spatial analysis, leisure concepts, research.

**882. Recreation Research Seminar**  
Fall. 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.

**408. Clinical Pathology**  
Fall, Spring. 3(3-0) or 5(3-4) Approval of department.

Immunohematology, urinalysis, and topics in blood chemistry.

**502. Human Pathology I**  
Winter. 2 to 5 credits. Admission to a college of medicine 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. 2(2-1) 502.

An introductory study of neuropathology in which vocabulary and concepts of neuromuscular diseases are systematically reviewed. Self-instructional option available.

**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 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.

**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.

**650. Applied Veterinary Pathology**  
Fall, Winter, Spring, Summer. 8(4-12) Completion of eighth term of professional veterinary medicine curriculum.

Instruction, demonstration and practice in laboratory diagnosis of animal diseases, using the techniques of necropsy and clinical pathology and correlating the results with those of microbiology, toxicology and histopathology.

**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.

**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**  
Fall. 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 approval of department.

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

**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.

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.

**PATHOLOGY PTH**

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

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

**407. Clinical Pathology**  
Winter, Summer. 3(3-0) or 5(3-4) Approval of department.

Theory and technics in hematology and coagulation.

**Descriptions — Pathology  
of  
Courses**

**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. 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 re-enroll for a maximum of 9 credits. Approval of department.

**520A. Principles of Pharmacology**

(520.) Fall. 4(4-0) PSL 500B, 500C. Primarily for students of Veterinary Medicine.

Drug absorption, distribution, biotransformation, antagonism; receptor-theory and pharmacogenetics; adverse drug reactions, chemical toxicity. Chemotherapy (antimicrobial, anthelmintic, anti-neoplastic agents). Pharmacology of the autonomic nervous system.

**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.

**521A. Pharmacodynamics**

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

Pharmacology of drugs that affect the heart, kidney, central nervous system and non-vascular smooth muscle. Endocrine and autocoid pharmacology.

**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.

**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. Advanced Renal and Autocoid Pharmacology**

Spring of even-numbered years. 4(4-0) 521A or B and approval of department.

Advanced renal, endocrine and autocoid pharmacology.

**812. Advanced Principles of Pharmacology and Toxicology**

Spring of odd-numbered years. 5(5-0) 521A or 521B.

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

**813. Cardiac Pharmacology**

Winter of even-numbered years. 4(4-0) 520A, 521A or 520B, 521B; PSL 801, 802, 803; or approval of instructor.

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 5 credits. May re-enroll for a maximum of 15 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 15 credits.

**980. Problems**

Fall, Winter, Spring, Summer. 2 to 5 credits. May re-enroll for a maximum of 20 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.

**212. Introduction to the History of Philosophy, Part II**

Winter, Spring. 3(3-0)

The Middle Ages and early modern periods, with emphasis on Aquinas, Descartes, Spinoza and Leibniz.

**213. Introduction to the History of Philosophy, Part III**

Fall, Spring. 3(3-0)

The eighteenth and nineteenth centuries with emphasis on British empiricism, Kant, and post-Kantian philosophy.

**294. Special Topics**

Fall, Winter, Spring, Summer. 2(2-0) to 6(6-0) Approval of department.

Intensive study of some particular problem or author in philosophy.

**311. Indian Philosophy**

Fall, Winter. 3(3-0)

Metaphysical, ethical and social theories developed within major Indian philosophical systems; e.g., philosophical Buddhism, Vedantist transcendentalism, Samkya dualism, and the Realist schools.

**312. Chinese Philosophy**

Spring. 3(3-0)

Major cosmological and ethical doctrines of such Chinese authors and movements as Confucius, Mo Tzu, Lao Tzu, Taoism, Yin-Yang dualism, Buddhism, responses to Western influences, the new China.