

**590. Special Problems in Pediatrics**  
Fall, Winter, Spring, Summer. 1 to 8 credits. Approval of department.  
Each student will work under direction of a faculty member on an experimental, theoretical or applied problem.

**600. Pediatrics Clerkship**  
Fall, Winter, Spring, Summer. 8 credits. Grade P in all courses offered in terms 1 through 8 or approval of department.  
Practical clinical exposure in the area of pediatrics. Program developed to achieve proficiency in motor skills and aptitudes; comprehension of concepts and principles; patient evaluation, diagnosis, management and therapy.

**620. Directed Studies**  
Fall, Winter, Spring, Summer. 2 to 24 credits. May reenroll for a maximum of 48 credits. PED 600 or approval of department.  
Study in general or specialty pediatrics.

## PEDIATRICS AND HUMAN DEVELOPMENT PHD

### College of Human Medicine

**520. Genetics Clinic**  
Fall, Winter, Spring, Summer. 1 to 3 credits. My reenroll for a maximum of 9 credits.  
Students will interview and examine patients with inheritable disorders, perform related laboratory diagnostic procedures, and participate in genetic counseling conferences and discussions.

**533. Genetics for Medical Practice**  
Fall. 3(3-0) BCH 512 or approval of department.  
Genetic principles including molecular genetics and their application to clinical medicine and the etiology of disease.

**571. Infant through Adolescent Development**  
Winter. 3(3-0) H M 570  
Characteristics of physical, cognitive, language, social and emotional development, infancy through early adolescence. Interaction of biologic, psychologic and social factors in the developmental process.

**573. Behavioral Problems: Infancy through Adolescence**  
Fall. 2(2-0) H M 572. Interdepartmental with the Department of Psychiatry.  
Origin, course and treatment of disorders of function and behavior in infancy through early adolescence commonly seen by physicians. Emphasis on role of development and biopsychosocial interaction.

**590. Special Problems in Human Development**  
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Human Medicine students or approval of department.  
Each student will work under direction of a staff member on an experimental, theoretical or applied problem.

**607. Ambulatory Care Clerkship**  
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. FMP 602. Interdepartmental with the departments of Family Practice, and Medicine. Administered by the Department of Family Practice.  
Outpatient experience, lasting an equivalent of 34 half-days and extending over a minimum of 26 weeks. Continuous and comprehensive patient care under supervision of appropriate physicians.

**608. Pediatric Specialty Clerkship**  
Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 43 credits. FMP 602.  
Clinical experience with pediatric patients under the direction of members of the faculty of the Department of Human Development and community pediatricians. Fall, Saginaw. Winter, Lansing. Spring, Grand Rapids. Summer, Flint.

**609. Human Development and Pediatric Sub-Specialties**  
Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 34 credits. PHD 608.  
Elected experiences in selected clinical and basic sciences related to pediatrics and human development.

**610. Ambulatory Pediatrics**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Clinical experience in outpatient and community settings involving ongoing child health care including chronic medical illnesses and common behavioral problems.

**611. Infectious Diseases**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Combined office or clinic and inpatient experience in evaluating and managing pediatric patients with infectious diseases.

**612. Neonatology**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Clinical experience involving modern neonatal techniques and care patterns for the sick neonate.

**613. Pediatric Cardiology**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Office, clinic and hospital experience in diagnostic and therapeutic pediatric cardiology including special diagnostic procedures.

**614. Pediatric Endocrinology and Metabolism**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Clinic and hospital experience in evaluating patients with endocrine and metabolic disorders.

**615. Pediatric Hematology and Oncology**  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Clinical experience in evaluating and managing pediatric patients with common hematologic and oncologic disorders.

**617. Pediatric Pulmonary Disease Clerkship**  
Fall, Winter, Spring, Summer. 6 credits. May reenroll for a maximum of 12 credits. PHD 608.  
Inpatient and outpatient clinical experiences in evaluating and managing pediatric patients with a range of pulmonary disease problems. Diagnostic procedures, clinically relevant physiology, current research.

## PHARMACOLOGY AND TOXICOLOGY PHM

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

**350. Introductory Human Pharmacology**  
Winter, Spring. 4(4-0) 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.

**450. Introduction to Chemical Toxicology**  
Spring. 3(3-0) B S 210, B S 211, B S 212, CEM 242.  
Potential risk of environmental chemicals to animal and human health.

**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.

**520. Medical Pharmacology I**  
Fall. 4(4-0) PSL 500A or PSL 500E; BCH 501 or BCH 512.  
Drug absorption, distribution, biotransformation, elimination, antagonism; receptor theory and pharmacogenetics. Cardiac and renal drugs, pharmacology related to the autonomic nervous system.

**521. Medical Pharmacology II**  
Winter. 4(4-0) PHM 520.  
Pharmacology of the central and peripheral nervous systems. Chemotherapy: antineoplastic, antiviral and antimicrobial agents. Toxicology and emergency therapies. Endocrine and autacoid pharmacology.

**554. Veterinary Pharmacology and Toxicology I**  
Fall. 4(4-0) PSL 500B, PSL 500C.  
Drug absorption, distribution, biotransformation, elimination, receptor theory and pharmacogenetics; chemical toxicity; autonomic nervous system, cardiovascular and renal pharmacology.

**Descriptions — Pharmacology and Toxicology  
of  
Courses**

**555. Veterinary Pharmacology and Toxicology II**  
Winter. 5(4-2) PHM 554.  
Endocrine, autacoid and central nervous system pharmacology; chemotherapy: antimicrobials, antihelminthics, antineoplastics.

**582. Clinical Pharmacology Studies**  
Fall, Winter, Spring, Summer. 2(2-0)  
PHM 520 or approval of instructor.  
Cases in clinical pharmacology.

**594. Veterinary Toxicology**  
(V M 594.) Spring. 4(4-0) Ninth-term  
Veterinary Medicine students.  
Pharmacological basis and pathological features of diseases of animals caused by common toxic chemicals with emphasis on clinical manifestations, diagnosis, prevention, and treatment.

**810. Synaptic Transmission**  
Spring 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.

**813. Cardiac Pharmacology**  
Winter of even-numbered years. 4(4-0)  
PHM 555 or PHM 521; PSL 801, approval of department.  
Effects of drugs on normal physiological and biochemical processes in cardiac cells. Emphasis is placed on cell electrophysiology and ion flux.

**814. Advanced Principles of Toxicology**  
Spring of even-numbered years. 4(4-0)  
PHM 521 or PHM 555.  
Current biochemical and physiological mechanisms of toxicity on major organ systems. Mechanisms of mutagenicity, carcinogenicity and teratology.

**819. Principles of Drug-Tissue Interactions**  
Summer. 5(4-2) Approval of department.  
Drug absorption, distribution, metabolism and excretion; drug-receptor interactions including methods for assessing receptor number and affinity; dose response relationships; pharmacokinetics; altered drug sensitivity and response; toxicology.

**820. Drug Actions, Effects and Uses I**  
Fall. 5(4-2) PHM 819.  
Mechanisms of intracellular and extracellular signalling. Effects of therapeutic and toxic agents on cells of the cardiac, renal and autonomic nervous systems. Uses of therapeutic agents and important investigative chemicals.

**821. Drug Actions, Effects and Uses II**  
Winter. 5(4-2) PHM 819, PHM 820.  
Effects of therapeutic and toxic agents on cells of endocrine and central nervous systems. Autacoid pharmacology. Chemotherapy of infectious and neoplastic diseases. Uses of therapeutic agents and important investigative chemicals.

**827. Neurobiology**  
Fall. 4(4-0) Approval of department.  
Interdepartmental with the departments of Physiology and Zoology. Administered by the Department of Zoology.  
Neural structure and function at cellular and intercellular levels. Membrane and synaptic potentials, receptor transduction, and intracellular transport with an introduction to comparative and evolutionary aspects.

**839. Systems Neuroscience**  
Winter of odd-numbered years. 5(4-2)  
Approval of department. Interdepartmental with the departments of Anatomy and Physiology. Administered by the Department of Anatomy.  
Physiology, anatomy and pharmacology of sensory, somatomotor and autonomic neural systems.

**841. Advanced Endocrine Physiology and Pharmacology**  
Fall of odd-numbered years. 5(5-0)  
PSL 500E or approval of course coordinator. Interdepartmental with and administered by the Department of Physiology.  
Basic and advanced physiologic and pharmacologic concepts of general endocrinology including reproductive endocrinology.

**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. Master's Thesis 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. Doctoral Dissertation 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 a major area of philosophy. Together they provide a comprehensive introduction to philosophical inquiry. The courses may be taken independently and in any order.

**101. Introduction to Philosophy: Ethics and Value (A)**  
Fall, Winter, Spring, Summer. 3(3-0)  
Students may not receive credit for both PHL 101 and PHL 330.  
An inquiry into the nature of the right and the good, addressed to such fundamental problems as the objectivity of moral judgments, the criteria of right and wrong, and the grounds of moral responsibility.

**102. Introduction to Philosophy: Knowledge and Reality (A)**  
Fall, Winter, Spring, Summer. 3(3-0)  
An examination of such basic philosophical problems as free will and determinism, the existence of God, the relation of mind and body, and the scope and limits of human knowledge.

**103. Introduction to Philosophy: Logic**  
Fall, Winter, Spring, Summer. 3(3-0)  
An examination of deductive and inductive reasoning and of such topics as rational argumentation, fallacies, definition, meaning, truth, and evidence. Designed to improve students' capacities to read and think critically.

**120. Classics of Philosophical Literature (A)**  
Fall, Winter, Spring. 4(4-0)  
An introduction to contrasting classics of literary and philosophical importance. Primary texts from such philosophers as Plato, Lucretius, Descartes, Hume, Nietzsche, James, Russell and Sartre will be read and discussed.

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

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Taken together, PHL 211, PHL 212 and PHL 213 provide a comprehensive introduction to the history of western philosophy. It is recommended that these courses be taken in sequence. However, if only one course is taken it may be any one of these, since each course is self-contained and may be taken independently of the others.

**211. Ancient Philosophy (A)**  
Fall, Winter, Spring. 3(3-0)  
An introduction to the history of philosophy: the Greek and Roman periods, with emphasis on Plato and Aristotle.

**212. Medieval and Early Modern Philosophy (A)**  
Winter, Spring. 3(3-0) PHL 211 recommended.  
An introduction to the history of philosophy: the Middle Ages to the rise of modern science, with emphasis on Aquinas, Descartes, Spinoza and Leibniz.

**213. Modern Philosophy (A)**  
Fall, Spring. 3(3-0) PHL 212 recommended.  
An introduction to the history of philosophy: the Enlightenment to the nineteenth century, with emphasis on Hume and Kant and such other philosophers as Locke, Berkeley, Hegel, Kierkegaard and Nietzsche.

**312. Chinese Philosophy**  
Spring. 3(3-0)  
Comparative moral philosophy of Confucianism, Taoism, and Buddhism and their metaphysical and cultural roots. Concepts of enlightenment and human nature.

**323. Existentialism**  
Fall, Winter, Spring. 3(3-0) Three credits in philosophy or approval of department.  
Such authors as Husserl, Jaspers, Kierkegaard, Marcel, Nietzsche, Sartre and such topics as hope, anxiety, bad faith, subjectivity, freedom, social being, and phenomenological method.