

520. Biology of Blood Diseases Laboratory
Spring. 1(0-3) Enrollment in a college of medicine or a graduate program in a biological science; MED 520 concurrently. Laboratory experience correlating basic science and clinical concepts of hematology.

550. Veterinary Pathology
Spring. 5(3-4) Third-term Veterinary Medicine students or approval of department. Principles of pathology, including causes of disease, disturbances of cell growth and metabolism, necrosis, circulatory changes, inflammation and neoplasia.

552. Veterinary Clinical Pathology
Winter. 4(3-3) Fifth-term Veterinary Medicine students or approval of department. Technical aspects, principles and interpretation of selected laboratory procedures in hematology, chemistry, cytology and related areas.

608. Pathology Clerkship
Fall, Winter, Spring, Summer. 3 to 17 credits. May reenroll for a maximum of 17 credits. Grade P in all courses offered in terms 1 through 8. Anatomic and clinical pathology, with emphasis on clinical-pathological correlations. Conducted in the pathology departments of affiliated hospitals.

609. Laboratory Medicine Clerkship
Fall, Winter, Spring, Summer. 6 credits. May reenroll for a maximum of 12 credits. Grade P in all courses in terms 1 through 8. Current laboratory procedures. Correlation of data from patients with clinical disease, to morphologic abnormalities and altered pathophysiology.

621. Histopathology Clerkship
Winter. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department. Supervised instruction in the examination and interpretation of histologic lesions caused by animal diseases.

651. Veterinary Clinical Pathology Clerkship
Fall, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department. Concepts in laboratory interpretation and diagnosis.

652. Veterinary Necropsy Clerkship
Fall, Winter, Spring, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department. Supervised necropsy and interpretation of findings.

656. Problems in Veterinary Necropsy
Fall, Winter, Spring, Summer. 4 credits. PTH 652, approval of department. Problems related to necropsy and interpretation of findings.

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 reenroll 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) PTH 802 and approval of department. Continuation of PTH 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. Postmortem Diagnosis
Fall, Spring. 3(0-9) May reenroll 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 results of other tests.

811. Advanced Clinical Pathology
Spring of even-numbered years. 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) PTH 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
Winter of even-numbered years. 4(4-0) Medical degrees, approval of instructor. Macro and microscopic studies on the diseases of laboratory animals.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

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

PEDIATRICS PED

(Established effective January 1, 1979.)
College of Osteopathic Medicine

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
(O M 652.) Fall, Winter, Spring, Summer. 6 or 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. PED 600 or approval of department. Study in general or specialty pediatrics.

620. Directed Studies
Fall, Winter, Spring, Summer. 2 to 24 credits. PED 600 or approval of department. Study in general or specialty pediatrics.

PEDIATRICS AND HUMAN DEVELOPMENT PHD

(Name changed July 1, 1979. Formerly Department of Human Development.)
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.

531. Medical Genetics
Fall. 1(1-0) Admission to a college of medicine or approval of department. Basic genetic principles and their application to clinical medicine, prenatal genetic diagnosis, exercises in genetic counseling and the importance of relevant laboratory tests.

532. Phenomena of Development
Fall. 5(5-0) PHD 531 or approval of department. Normal psychological and physical development of the human including intellectual, social, emotional and endocrinological growth from infancy through adolescence. Clinical examples highlight deviations from the normal course of development.

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.

**Descriptions – Pediatrics and Human Development
of
Courses**

607. Ambulatory Care Clerkship
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. H M 602. Interdepartmental with the departments of Community Health Science, Family Practice, and Medicine. Administered by the Department of Family Practice.

Outpatient experience, lasting an equivalent of 48 half days over a period of six months or more, emphasizing continuous and comprehensive patient care under the supervision of appropriate physicians.

608. Pediatric Specialty Clerkship
Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 43 credits. H M 602; primary clerkship.

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. H M 602.

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.

PHARMACOLOGY AND TOXICOLOGY PHM

**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.

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.

503. Cell Biology
Fall. 5(5-0) Admission to the College of Human Medicine. Interdepartmental with the departments of Biochemistry, Microbiology and Public Health, and Physiology. Administered by the Department of Microbiology and Public Health.

Principles of cell biology for medical students.

520. Medical Pharmacology I
(520B.) Winter. 4(4-0) PSL 500A or PSL 500E; BCH 501 or BCH 512.

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.

521. Medical Pharmacology II
(521B.) Spring. 4(4-0) PHM 520.

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

554. Veterinary Pharmacology and Toxicology I
(520A.) 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.

555. Veterinary Pharmacology and Toxicology II
(521A.) Winter. 5(4-2) PHM 554.

Endocrine, autacoid and central nervous system pharmacology; chemotherapy; antimicrobials, antihelminthics, antineoplastics.

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 Autacoid Pharmacology
Spring of even-numbered years. 4(4-0) PHM 521 or PHM 555, approval of department.

Advanced concepts and current topics in renal and autacoid pharmacology.

812. Advanced Principles of Pharmacology
Fall. 2(2-0) PHM 521 or PHM 555.

Pharmacodynamics, drug-receptor interactions, computer modeling, drug metabolism.

813. Cardiac Pharmacology
Winter of even-numbered years. 4(4-0) PHM 555 or PHM 521; PSL 801, PSL 802, PSL 803; 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.

814. Advanced Principles of Toxicology
Spring of even-numbered years. 4(4-0) PHM 812.

Current biochemical and physiological mechanisms of toxicity on major organ systems. Mechanisms of mutagenicity, carcinogenicity and teratology.

820. Advanced General Pharmacology
Winter. 3(2-2) PHM 520 or concurrently.

Discussions, demonstrations and laboratories designed to supplement information provided in PHM 520 on the pharmacokinetics and actions of drugs that influence the autonomic and cardiovascular systems.

821. Advanced General Pharmacology
Spring. 3(2-2) PHM 520, PHM 820; PHM 521 or concurrently.

This course complements PHM 521 (Pharmacodynamics) with increased coverage of toxicology, chemotherapy (antibiotic, anticancer, and antiparasitic) and central nervous system drugs, including narcotic analgesics and psychoactive agents.

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.