853. Advanced Systemic Pathology
Spring of odd years. 4(3-2) R: Approval of department.
Pathological aspects of the nervous, endocrine, cardiovascular, respiratory, urinary, genital, musculoskeletal, integumentary and special sense systems.

854. Advanced Clinical Pathology
Spring of even years. 3(3-0) P: PTH 540, PTH 552, PTH 609, PTH 651. R: Approval of department.
Hematology including anemias, leukocyte responses and hemostasis. Clinical chemistry including tests to evaluate organs.

855. Essentials of Scientific Communication
Fall of odd years. 2(2-0) R: Approval of department.
Preparation, editing, and review of research manuscripts and grants. Critique of oral presentations. Illustrations of research data and thesis preparation. Philosophy and methods of research.

857. Correlative Diagnostic Pathology
Fall, Spring, Summer. 3(0-6) R: Approval of department.
Diagnosis of animal diseases by necropsy, biopsy, or clinical pathology. Correlation of diagnostic test results with history, laboratory data and morphologic findings. Compilated and formal presentation of findings.

858. Pathology of Avian Diseases
Spring of even years. 2(2-0) R: Approval of department.
An overview of disease and pathology affecting domestic poultry, pet birds, and wild birds.

859. Avian Histopathology Laboratory
Spring of even years. 1(0-2) R: Approval of department.
Recognition and description of microscopic lesions of avian diseases.

890. Problems in Veterinary Pathology
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.
Faculty supervised work on an experimental, theoretical or applied problem in veterinary pathology.

891. Problems in Pathology
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Approval of department.
Faculty supervised work on an experimental, theoretical or applied problem in pathology.

892. Pathology Seminar
Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Approval of department.
Presentation and discussion of current topics in pathology by departmental graduate students, faculty or outside speakers.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Approval of department.

901. Investigating the Lung
Fall of even years. 3(3-0) Interdepartmental with Large Animal Clinical Sciences; and Physiology. Administered by Large Animal Clinical Sciences. R: Open only to M.S. and Ph.D. students in Large Animal Clinical Sciences, Small Animal Clinical Sciences, Physiology, and Pathology. Approval of department.
Classic and current concepts of respiratory structure and function in health and disease. Mechanisms of lung injury.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Admission to doctoral program in Pathology.

PEDIATRICS PED

Department of Pediatrics
College of Osteopathic Medicine

590. Special Problems in Pediatrics
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine. Approval of department.
Experimental, theoretical, or applied problems under faculty direction.

600. Pediatrics Clerkship
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate-professional students in the colleges of Osteopathic Medicine and Human Medicine upon completion of Units I and II.
Practical clinical exposure in the area of pediatrics.

602. Primary Care Ambulatory Clerkship
Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course. Interdepartmental with Osteopathic Medicine; Internal Medicine; Osteopathic Surgical Specialities; Psychiatry; and Family and Community Medicine. Administered by Osteopathic Medicine. P: Successful completion of the preclerkship requirements in College of Osteopathic Medicine Units I and II.
A 24-week ambulatory care continuity experience involving 12 weeks in a multidisciplinary environment (family medicine, pediatrics, and internal medicine), 6 weeks in family medicine and 6 weeks in specialty areas (internal medicine, surgery, and obstetrics and gynecology). Didactic sessions are scheduled concurrently.

619. Ambulatory Care Clerkship
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 15 credits in all enrollments for this course. Interdepartmental with Family Practice; and Medicine. Administered by Family Practice. P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.
Continuous and comprehensive patient care under supervision of appropriate physicians.

620. Directed Studies
Fall, Spring, Summer. 1 to 30 credits. A student may earn a maximum of 30 credits in all enrollments for this course. P: PED 600. R: Open only to graduate-professional students in the College of Osteopathic Medicine. Approval of department.
Study in general or specialty pediatrics.

PEDIATRICS AND HUMAN DEVELOPMENT PHD

Department of Pediatrics and Human Development
College of Human Medicine

523. Genetics for Medical Practice
Summer. 1(1-0) Interdepartmental with Biochemistry. R: Graduate-professional students in colleges of Human Medicine and Osteopathic Medicine.
Basic principles of genetics for medical students.

524. Genetics Clinic
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. P: PHD 523. R: Graduate-professional students in colleges of Human and Osteopathic Medicine.
Role of genetics in health care delivery under the direction of a faculty member.

591. Special Problems in Human Development
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Graduate-professional students in colleges of Human and Osteopathic Medicine.
Work under the direction of a faculty member on an experimental, theoretical, or applied problem.

600. Pediatric Specialty Clerkship
Fall, Spring, Summer. 6 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course. R: Open only to graduate-professional students in College of Human Medicine. Completion of preclinical CHM curriculum.
Multidisciplinary approach to children and their families in a health care setting. Integrated biological, behavioral, and clinical sciences in assessing and planning children's health care needs.

601. Human Development and Pediatric Sub-specialties
Fall, Spring, Summer. 6 to 24 credits. A student may earn a maximum of 24 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Experience in clinical, behavioral, and basic sciences related to pediatrics and human development.

602. Ambulatory Pediatrics
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Clinical experience in outpatient and community setting involving ongoing child health care.

603. Pediatric Infectious Diseases Clerkship
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Office, clinic, and inpatient experiences in evaluating and managing pediatric patients with infectious diseases.

604. Neonatology
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Clinical experiences: modern neonatal techniques and care patterns for neonates including follow up.

605. Pediatric Cardiology Clerkship
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Office, clinic, and hospital experience in diagnostic and therapeutic pediatric cardiology including special diagnostic procedures.

606. Pediatric Endocrinology and Metabolism Clerkship
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Clinic and hospital experience in evaluating patients with endocrine and metabolic disorders.

607. Pediatric Hematology and Oncology
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate professional students in College of Human Medicine.
Clinical experience in evaluating and managing pediatric patients with common hematologic and oncologic disorders

608. Pediatric Pulmonary Disease Clerkship
Fall, Spring, Summer. 6 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: PHD 600. R: Open only to graduate-professional students in College of Human Medicine.
Inpatient and outpatient clinical experiences in evaluating and managing pediatric patients with pulmonary problems. Diagnostic procedures, clinically relevant physiology, current research.

633. Extended Clinical Experience
Fall, Spring, Summer. 6(6-0) P: (PHD 600)
Based in community hospitals and ambulatory sites, this is a 4 week clinical experience emphasizing interviewing skills, history, physical exam, problem solving and therapy.

635. Core Competencies I
Fall. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine; Family Practice; and Medicine. Administered by Human Medicine. P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

637. Core Competencies III
Spring, Summer. 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Human Medicine; Family Practice; Medicine; Obstetrics,Gynecology and Reproductive Biology; and Surgery. Administered by Human Medicine. P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.
A weekly seminar addressing core knowledge and skills from an interdisciplinary perspective.

PHARMACOLOGY AND TOXICOLOGY PHM

Department of Pharmacology and Toxicology
College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine

350. Introductory Human Pharmacology
Fall, Spring. 3(3-0) P: PSL 250. R: Not open to freshmen.
General principles of pharmacology. Central and autonomic nervous systems. Cardiovascular and renal drugs. Chemotherapy. Anti-infective drugs and endocrine agents.

430. Drug Abuse
Fall of odd years. 3(3-0) R: Not open to freshmen and sophomores.
Pharmacology, physiology, and neuroscience related to the pharmacodynamics of drugs of abuse.

450. Introduction to Chemical Toxicology
Spring. 3(3-0) P: BS 110, BS 111, CEM 251. R: Not open to freshmen and sophomores.
Mammalian toxicology. Disposition of chemicals in the body, detoxication, elimination, and mechanisms of toxicity in major organ systems. Selected toxic agents.

480. Special Problems
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department. Not open to students with credit in PHM 350 or PHM 430.
Individual work on selected research problems.

556. Veterinary Pharmacology
Fall. 5(5-0) R: Completion of 2 semesters of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PHM 554 or PHM 555.
Drug absorption, disposition, biotransformation, excretion, pharmacokinetics. Pharmacologic agents of the autonomic nervous, cardiovascular, renal, central nervous, endocrine, and gastrointestinal systems.

557. Veterinary Toxicology
Spring. 2(2-0) R: Completion of 3 semesters of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PHM 594.
Determinants of toxic responses, analytical toxicology, genetic toxicology, and toxin management. Diagnosis, prevention, and treatment of common toxicoses.

563. Medical Pharmacology
Summer. 3(3-0) R: Graduate-professional students in colleges of Human and Osteopathic Medicine.
General principles of pharmacology and selected drugs. Rational drug therapy.

658. Research Problems in Pharmacology and Toxicology
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Completion of 4 semesters of the graduate-professional program in the College of Veterinary Medicine. Approval of department.
Selected research problems in pharmacology or toxicology.

810. Synaptic Transmission
Spring of odd years. 3(3-0) R: Approval of department.
Chemical and electrical aspects of nerve impulse transmission at synaptic and neuroeffector junctions. Influence of drugs.

813. Cardiovascular Pharmacology
Spring of even years. 3(3-0) R: Approval of department.
Cardiovascular signal transduction and control in normal and pathophysiologic states.

814. Advanced Principles of Toxicology
Spring of even years. 3(3-0) P: PHM 819.
Biochemical, molecular and physiological mechanisms of toxicology. Responses of major organ systems to chemical insult. Mechanisms of mutagenesis and carcinogenesis.