

- 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.
- 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, Medicine, and Family Practice. 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, Medicine, Family Practice, Surgery, and Obstetrics, Gynecology and Reproductive Biology. 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.
- 640. Advanced Comprehensive Care**
Fall, Spring, Summer. 6 credits. A student may earn a maximum of 18 credits in all enrollments for this course. Interdepartmental with Human Medicine, Medicine, Family Practice, and Obstetrics, Gynecology and Reproductive Biology. Administered by Human Medicine.
P: FMP 608, PHD 600, MED 608. R: Open only to graduate-professional students in College of Human Medicine.
 Clinical experience in community-oriented primary care. Emphasis on urban and rural underserved populations.
- 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-numbered 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.

PHARMACOLOGY AND TOXICOLOGY PHM

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

- 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 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-numbered 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. Cardiac Pharmacology**
Spring of even-numbered years. 3(3-0)
P: PHM 820. R: Open only to graduate students. Approval of department.
 Effects of drugs on normal physiological and biochemical processes in cardiac cells.
- 814. Advanced Principles of Toxicology**
Spring of even-numbered 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.
- 815. Concepts in Tumorigenesis**
Spring of odd-numbered years. 2(2-0)
P: BCH 462, PSL 432, PSL 460. R: Approval of department.
 Examination and discussion of literature in tumorigenesis.

Descriptions — Pharmacology and Toxicology of Courses

817. Advanced Neurotoxicology
Summer of odd-numbered years. 3(3-0) Interdepartmental with Animal Science.
P: PHM 814 or ZOL 827.
Types of damage occurring in the nervous system. Unique forms of neurotoxicity associated with specific groups of neurotoxicants.

819. Principle of Drug-Tissue Interactions
Summer. 5(5-0)
R: Open only to graduate students. Approval of department.
General principles relevant to the interaction of chemicals with biological systems.

820. Drug Actions, Effects and Uses
Fall. 5(5-0)
P: PHM 819. R: Open only to graduate students. Approval of department.
Major principles of physiological and biochemical actions of major drugs.

827. Advanced Neurobiology
Fall. 4(4-0) Interdepartmental with Zoology and Physiology. Administered by Zoology.
R: Approval of department.
Nervous system function at the cellular level: membrane biophysics and potentials, synaptic transmission.

839. Systems Neuroscience
Spring of odd-numbered years. 4(4-0) Interdepartmental with Anatomy and Physiology. Administered by Anatomy.
R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Agriculture and Natural Resources, Natural Science, and Veterinary Medicine.
Anatomy, pharmacology, and physiology of multicellular neural systems. Sensory, motor, autonomic, and chemo-regulatory systems in vertebrate brains.

841. Advanced Endocrine Physiology and Pharmacology
Fall. 4(4-0) Interdepartmental with Physiology, Animal Science and Psychology. Administered by Physiology.
P: BCH 461, PSL 432. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources.
Basic and advanced concepts of endocrine and reproductive physiology and pharmacology.

870. Research Rotation
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to first year graduate students in Pharmacology and Toxicology. Approval of department.
Individual work on selected research problems.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in Pharmacology and Toxicology. Approval of department.

910. Seminar
Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course.
R: Open only to graduate students. Approval of department.
Discussion of recent topics in pharmacology and toxicology by faculty or invited outside speakers. Students research reports.

980. Problems
Fall, Spring, Summer. 2 to 5 credits. A student may earn a maximum of 20 credits in all enrollments for this course.
R: Open only to graduate students. Approval of department.
Limited work in selected research projects.

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: Open only to graduate students in Pharmacology and Toxicology. Approval of department.

PHILOSOPHY PHL
Department of Philosophy
College of Arts and Letters

130. Logic and Reasoning
Fall, Spring. 3(3-0)
R: Not open to students with credit in PHL 330.
Deductive and inductive reasoning. Topics such as rational argumentation, fallacies, definition, meaning, truth and evidence. Techniques for critical reading and thinking.

200. Introduction to Philosophy
Fall, Spring. 3(3-0)
Theories of knowledge, values, and reality. Topics such as objectivity, relativism and cultural diversity, moral responsibility, aesthetic values, the self, existence of God, free will, minds and machines.

210. History of Western Philosophy: Ancient and Medieval
Fall. 3(3-0)
Greek philosophy with emphasis on Plato and Aristotle; Roman philosophy; and medieval philosophy.

211. History of Western Philosophy: Modern
Spring. 3(3-0)
P: PHL 210 recommended.
Philosophy from the Renaissance through the nineteenth century, with emphasis on such philosophers as Descartes, Spinoza, Locke, Hume, Kant, Hegel, Kierkegaard and Nietzsche.

312. Chinese Philosophy
Spring. 3(3-0)
R: Not open to freshmen and sophomores.
Central traditions in the history of Chinese philosophy: Confucianism, Taoism, Chan Buddhism, Neo-Confucianism.

320. Existentialism
Fall. 3(3-0)
P: One PHL course.
Husserl, Jaspers, Kierkegaard, Marcel, Nietzsche, Sartre, and de Beauvoir. Topics such as hope, anxiety, bad faith, subjectivity, freedom, social being, phenomenological method.

330. Formal Reasoning I
Fall, Spring. 4(4-0)
Formal methods in deductive reasoning. Logic of connectives and quantifiers, including identity, functions, and descriptions.

331. Formal Reasoning II
Spring. 4(4-0)
P: PHL 330.
Axiomatic method. Informal axiomatizations of set theory and probability theory. Metatheory of elementary logic.

340. Ethics
Fall, Spring. 3(3-0)
P: One PHL course.
Inquiry through the writings of some important theorists, their critics and their contemporary followers. Aristotle, Hume, Kant, Mill, Sidgwick.

344. Ethical Issues in Health Care
Fall, Spring. 4(4-0)
R: Not open to freshmen and sophomores.
Termination of treatment, truth-telling, informed consent, human experimentation, reproductive issues, allocation of scarce resources, justice and the health care system.

345. Business Ethics
Fall. 4(4-0)
R: Not open to freshmen and sophomores.
Ethical dimensions of the relationships between a business and employees, consumers, other businesses, society, government, and the law.

347. Aesthetics
Fall. 3(3-0)
P: One course in art or literature or music or philosophy.
Theories of aesthetic value and the nature of art. Works of such aestheticians as Plato, Hume, Kant, Hegel, Tolstoy, Santayana, Wittgenstein, Isenberg, Langer, Murdoch.

350. Moral and Political Issues
Fall. 3(3-0)
P: One PHL course.
Justice, rights and responsibilities. Topics such as equality of opportunity, justice for the aged and future generations, and abortion.

354. Philosophy of Law
Fall, Spring. 3(3-0)
P: One PHL course or two PLS courses.
Legal concepts such as punishment, responsibility, rights and duties, and judicial decisions. Legal theories such as natural law, positivism and realism.

355. Philosophy of Technology
Spring. 4(4-0) Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.
P: LBS 133 or another Tier I writing course. R: Not open to freshmen. Open only to students in Lyman Briggs School and the Department of Philosophy.
Examination of the desirability of technology, its social forms, and its alternatives. Conventional productivist, ecological progressive, and radical humanist outlooks.

356. Philosophical Aspects of Feminism
Fall, Spring. 4(4-0)
Conceptual and normative issues in feminist theory. Topics such as sexism, oppression, coercion, control, power, equality, personhood, respect and self-respect, rape, separatism, community, intimacy, and autonomy.

357. Philosophy of Karl Marx
Spring. 3(3-0)
P: One PHL course.
Marx's philosophical thought and its bearing on science, religion, art and politics.

360. Philosophy of Language
Spring. 3(3-0)
P: One course in Philosophy.
Elementary topics in semantics, linguistic pragmatics, and philosophy of language. Meaning, denotation, speech acts, and linguistic relativity.