

## Pediatrics and Human Development—PHD

- 637 Core Competencies III**  
Fall, Spring, Summer. 2(2-0) Fall: same as below. Spring: Flint-Saginaw-GR-Lansing-Kalamazoo-UP. Summer: Flint-Saginaw-GR-Lansing-Kalamazoo-UP. 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; Surgery. Administered by College of Human Medicine. R: Open only to graduate-professional students in College of Human Medicine.  
Core knowledge and skills from an interdisciplinary perspective.

## PHARMACOLOGY PHM AND TOXICOLOGY

### Department of Pharmacology and Toxicology College of Veterinary Medicine

- 350 Introductory Human Pharmacology**  
Spring. 3(3-0) P:M: (PSL 250) or (PSL 431 and PSL 432) 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.
- 431 Pharmacology of Drug Addiction**  
Fall. 3(3-0) RB: Zoology or Human Biology or Psychology or Biochemistry or Physiology.  
Introduction to pharmacology and neuropharmacology. Understanding of the biological basis for drug abuse and addiction.
- 450 Introduction to Chemical Toxicology**  
Spring. 3(3-0) P:M: (BS 110 or LBS 144) and (BS 111 or LBS 145) and (CEM 251) R: Not open to freshmen or 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.  
Individual work on selected research problems.
- 556 Veterinary Pharmacology**  
Fall. 5(5-0) R: Completion of semester 2 of the graduate professional program in the College of Veterinary Medicine.  
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 semester 3 of the graduate professional program in the College of Veterinary Medicine.  
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 Semester 4 of the graduate-professional program in the College of Veterinary Medicine. Approval of department.  
Selected research problems in pharmacology or toxicology.
- 804 Molecular and Developmental Neurobiology**  
Fall. 3(3-0) Interdepartmental with Neuroscience; Psychology; Pathology; Zoology. Administered by Program in Neuroscience. RB: Bachelor's degree in a Biological Science or Psychology. R: Open only to graduate students in the Neuroscience major.  
Nervous system specific gene transcription and translation. Maturation, degeneration, plasticity and repair in the nervous system.
- 806 Advanced Neuroscience Techniques Laboratory**  
Spring. 3(0-9) Interdepartmental with Neuroscience; Psychology; Radiology; Physical Medicine and Rehabilitation. Administered by Program in Neuroscience. RB: (PHM 827) R: Open only to doctoral students in the Neuroscience major.  
Methods and underlying principles of neuroscience research.
- 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 pathophysiological states.
- 814 Advanced Principles of Toxicology**  
Spring of even years. 3(3-0) RB: (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 years. 2(2-0) RB: (BMB 462 and PSL 432 and PSL 460) R: Approval of department.  
Examination and discussion of literature in tumorigenesis.
- 819 Principles of Drug-Tissue Interactions**  
Summer. 1 to 2 credits. R: Approval of department.  
General principles relevant to the interaction of chemicals with biological systems. Topics include pharmacokinetics and/or pharmacodynamics.
- 820 Cellular and Molecular Mechanisms in Pharmacology and Toxicology**  
Fall. 1 to 3 credits. P:M: (BMB 801 and BMB 802) R: Approval of department.  
Comprehensive overview of the cellular and molecular mechanisms of drug and chemical actions in biological systems.
- 821 Principles of Systemic and Integrated Pharmacology and Toxicology**  
Spring. 2(2-0) RB: (PSL 828) or equivalent background in physiology R: Approval of department.  
Comprehensive overview of drug and chemical actions on the major organ systems of humans and other mammals.
- 827 Physiology and Pharmacology of Excitable Cells**  
Fall. 4(4-0) Interdepartmental with Physiology; Zoology; Neuroscience. RB: (PSL 431 or PSL 432 or BMB 401 or BMB 461 or ZOL 402)  
Function of neurons and muscle at the cellular level: membrane biophysics and potentials, synaptic transmission, sensory nervous system function.
- 839 Systems Neuroscience**  
Spring. 4(4-0) Interdepartmental with Neuroscience; Human Anatomy; Physiology; Psychology; Zoology. Administered by Program in Neuroscience. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Agriculture and Natural Resources, Natural Science, Social Science, and Veterinary Medicine. SA: ANT 839  
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; Psychology. Administered by Department of Physiology. RB: (BMB 461 and 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.  
Master's thesis research.

**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 50 credits in all enrollments for this course. R: Open only to graduate students in the Department of Pharmacology and Toxicology. Approval of department.

Doctoral dissertation research.

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

**340 Ethics**  
Fall, Spring. 3(3-0) RB: 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 or 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 or 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) RB: 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 Introduction to Social and Political Philosophy**  
Fall. 3(3-0) RB: One PHL course.  
History of social and political philosophy; problems such as obligation, power, oppression, freedom, equality, and community.

**354 Philosophy of Law**  
Fall, Spring. 3(3-0) RB: 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:M: Completion of Tier I writing requirement. R: Open only to sophomores or juniors or seniors in Lyman Briggs School or 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) RB: One PHL course.  
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) RB: One PHL course.  
Marx's philosophical thought and its bearing on science, religion, art and politics.

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

**380 Nature of Science**  
Fall, Spring. 3(3-0) RB: One course in the biological, physical, or mathematical sciences.  
Conflicting views about science and values. Such topics as scientific methodology; the objectivity and value neutrality of science; the presuppositions, goals, and limits of science; and science and decision making.

**410 Plato**  
Fall. 4(4-0) RB: (PHL 210) or two other PHL courses.  
Selection from Plato's dialogues including political and ethical theory, aesthetics, epistemology, and metaphysics.

**411 Aristotle**  
Spring. 4(4-0) RB: (PHL 210 or PHL 410) or two other PHL courses.  
Aristotle's major works and his major contributions to the sciences, metaphysics, ethics, and politics.

**413 Continental Rationalism**  
Fall of odd years. 4(4-0) RB: (PHL 211) or two other PHL courses.  
Rationalists of the seventeenth century, with emphasis on Descartes, Spinoza and Leibniz.

**414 British Empiricism**  
Fall of even years. 3(3-0) RB: (PHL 211) or two other PHL courses.  
The philosophy that strives to trace all our ideas and beliefs, whether in science, morality, or religion, back to their source in experience. Emphasis on the works of Locke, Berkeley, and Hume.

**415 Kant**  
Spring. 4(4-0) RB: (PHL 211) or two other PHL courses.  
Kant's metaphysical and epistemological system, focusing on his 'Critique of Pure Reason'.

**416 Hegel**  
Spring of even years. 4(4-0) RB: (PHL 211 or PHL 415) or two other PHL courses.  
Hegel's dialectic and its bearing on both the history of philosophy and issues about science, politics, art and religion.

**417 19th Century Philosophy**  
Fall. 4(4-0) RB: (PHL 210 or PHL 211) or two other PHL courses.  
Emphasis on attempts to overcome the limits on human knowledge postulated by Kant. Works by writers such as Fichte, Schopenhauer, Nietzsche, and James.

**418 Topics in 20th-Century Analytical Philosophy**  
Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: One PHL course at the 300 level or above.  
Issues in the works of such philosophers as Frege, Russell, Moore, Wittgenstein, Carnap, Quine, Austin, and Kripke.

**420 Topics in 20th-Century Continental Philosophy**  
Fall. 4(4-0) A student may earn a maximum of 12 credits in all enrollments for this course. RB: One PHL course at the 300 level or above.  
Recent European movements such as phenomenology, poststructuralism, critical theory, hermeneutics, and philosophical anthropology.

## PHILOSOPHY PHL

### Department of Philosophy College of Arts and Letters

**130 Logic and Reasoning**  
Fall, Spring. 3(3-0) 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 Ancient Greek Philosophy**  
Fall. 3(3-0)  
Philosophical problems of existence, knowledge, and action as addressed in selected readings from the Presocratics, Plato, Aristotle, and Hellenistic philosophers.

**211 Modern Philosophy**  
Spring. 3(3-0) RB: (PHL 210)  
Philosophy from the Renaissance through the nineteenth century, including Descartes, Spinoza, Locke, Hume, Kant, Hegel, Kierkegaard and Nietzsche.

**320 Existentialism**  
Fall. 3(3-0) RB: 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.