814 Advanced Principles of Toxicology
Spring of even years. 3(3-0) R: (PHM 819)
Biocatalytic, 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) R: (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) R: (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. R:
(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 of odd years. 4(4-0)
Interdepartmental with Anatomy; Physiology. Administered by Department of
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; 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 36 credits
in all enrollments for this course. R: Open
only to first year graduate students in
Pharmacology and Toxicology. Approval of
department.
Doctoral dissertation research.

PHILOSOPHY

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) R: (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) R: One PHL course.
Huysser, Jaspers, Kierkegaard, Marcel, Nietzsche,
Sartre, and de Beauvoir. Topics such as hope,
anger, 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.M. (PHL 330)
Axiomatic method. Informal axiomatizations of set
theory and probability theory. Metatheory of
elementary logic.

340 Ethics
Fall, Spring. 3(3-0) R: One PHL course.
Inquiry through the writings of some important
theorists, their critics and their contemporary

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) R: 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, Murdoc.

350 Introduction to Social and Political
Philosophy
Fall. 3(3-0) R: 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) R: 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.
Philosophy—PHL

356 Philosphical 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, separation, 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, aestetics, 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) 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) RB: One PHL course at the 300 level or above.
Recent European movements such as phenomenology, poststructuralism, critical theory, hermeneutics, and philosophical anthropology.

421 Topics in European Philosophy
Spring. 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.
A particular problem, topic, or author in nineteenth- and twentieth-century European philosophy, such as Kierkegaard, Husserl, Heidegger, Lukacs, Marxism vs. existentialism, and theories of interpretation.

430 Topics in Philosophy of Logic and Language
Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. RB: PHL 330, MTH 472, PHL 360, or LIN 437
Investigation of logical concepts; the philosophical significance of twentieth century results in logic; related issues in the semantics and pragmatics of natural language.

440 Central Issues in Ethics
Spring. 4(4-0) RB: (PHL 340 or PHL 350) Twentieth-century discussions of universalization, utilitarianism, nature of a moral theory, moral language, relativism, skepticism, theory and practice, weakness of will, moral education, and justification.

444 Philosophical Issues in Biomedicine
Fall of even years. 4(4-0) RB: (PHL 200 and PHL 344)
Philosophically puzzling features of medical research, policy, and practice. Issues in theories of knowledge, personal identity, reference and meaning.

450 Liberal Theory and Its Critics
Spring of even years. 3(3-0) RB: PHL 350 and one other course in PHL.
Main contemporary figures in the liberal tradition and their critics.

451 Philosophy and the Black Experience
Spring of odd years. 3(3-0) RB: PHL 340 or PHL 450
Philosophical issues about race and the black experience. Nature of racism, relationship of science to race, debates about identity, public policy and race.

456 Topics in Feminist Philosophy
Fall of odd years. 4(4-0) RB: PHL 356 or WS 401 or two 400-level courses in PHL.
Philosophical issues in a framework of feminist politics and critique. Standpoint theories, care/justice ethics, ontological status of genders/races, theories of power/dominination, determinism/freedom.

460 Epistemology
Fall. 3(3-0) RB: One PHL course at the 300 level or above.
Theories and concepts of knowledge, belief, epistemic justification, certainty, and reason.

461 Metaphysics
Spring. 3(3-0) RB: One PHL course at the 300 level or above.
Basic concepts employed in trying to understand the nature of things. Concepts include universals, particulars, things, kinds, properties, events, persons, change, causality, chance, existence, possibility, necessity, space, and time.

462 Philosophy of Mind
Fall. 3(3-0) RB: One PHL course at the 300 level or above.
Modern theories of the mind, other minds, and the mind's relation to the body. Theories include duality, behaviorism, criteriology, reductive and eliminative materialism, and functionalism.

463 Introduction to Cognitive Science
Spring. 3(3-0) Interdepartmental with Linguistics; Psychology. Administered by Department of Linguistics and Germanic, Slavic, Asian and African Languages. RB: (PHL 462 or LIN 401 or CSE 440 or PSY 200)
Cognitive processing of information by animals, humans, and computers. Relevant issues in philosophy, linguistics, psychology, neurophysiology, and artificial intelligence.

474 Aesthetic Theory and Modernism
Fall. 4(4-0) Interdepartmental with English; History of Art; Linguistics and Languages; Music; Romance Languages. R: Not open to freshmen or sophomores.
Problems, assumptions, and arguments of modern aesthetic theory examined in the context of debates over modernity and modernist artistic practice.

480 Philosophy of Science
Fall. 4(4-0) RB: (PHL 330) or a 200 level mathematics or statistics course.
Structure of scientific theories and explanation. Causation, prediction, induction, confirmation, discovery, and scientific progress.

484 Philosophy of Biological Science
Spring. 3(3-0) RB: Three courses in biological sciences or two PHL courses.
Philosophical and methodological issues in biology. Topics such as functional explanation, classification, the structure of evolutionary theory, reductionism, observation and measurement, or value-neutrality.

485 Philosophy of Social Science
Spring. 3(3-0) RB: Three courses in social science or two PHL courses.
Explanations, theories, and concepts in social science. Such topics as historicism; reductionism; rationality and relativism; comparison of logical empiricism, interpretive, and critical theory approaches.

486 Biotechnology in Agriculture: Applications and Ethical Issues
Fall of even years. 3(3-0) Interdepartmental with Horticulture; Crop and Soil Sciences; Forestry. Administered by Department of Horticulture. P.M. (BOT 105 or BS 111) RB: (CSS 350 or ZOL 341) R: Not open to freshmen or sophomores.
Current and future roles of biotechnology in agriculture: scientific basis, applications. Environmental, social, and ethical concerns.
487 Philosophy of Mathematics
Fall of odd years. 3(3-0) RB: (PHL 330) or three courses in mathematics.
Nature of mathematical truth and knowledge. Theses of logicism, formalism, intuitionism, and conventionalism.

490 Independent Study
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department.
Supervised special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

491 Special Topics in Philosophy
Fall, Spring, Summer. 3 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
Special topics supplementing regular course offerings, proposed by faculty on a group study basis.

492 Seminar for Majors (W)
Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: Completion of Tier I writing requirement. RB: 16 credits in Philosophy. R: Open only to juniors or seniors in the Department of Philosophy or approval of department.
Advanced, variable topic seminar for undergraduate majors. Seminar presentations. Substantial paper.

499 Senior Thesis Research (W)
Fall. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P:M: Completion of Tier I writing requirement. R: Open only to juniors or seniors in the Department of Philosophy. Approval of department.
Individual research project supervised by a faculty member that demonstrates the student's ability to do independent research and submit or present a major paper.

500 Proseminar in Philosophy
Fall. 3(3-0) R: Open only to master's students in the Department of Philosophy or approval of department.
The practice of graduate and professional work in philosophy: reading, writing, presentation, critique and revision; rigor of argument and clarity of expression; areas and methods of inquiry; cooperation and dialogue in inquiry; conferences, professional activities, and employment.

501 Osteopathic Manipulative Medicine I
Fall. 1(0-2) Interdepartmental with Osteopathic Manipulative Medicine. Administered by Department of Osteopathic Manipulative Medicine. R: Open only to students in the College of Osteopathic Medicine.
Basic osteopathic palpatory skills. Building on their basic palpatory skills, students will learn skills in the osteopathic manipulative treatment areas of counterstrain and muscle energy.

502 Osteopathic Manipulative Medicine - II
Spring. 1(0-2) Interdepartmental with Osteopathic Manipulative Medicine. Administered by Department of Osteopathic Manipulative Medicine. P:M: (OMM 501) R: Open only to students in the College of Osteopathic Medicine.
Students will continue to learn skills in the osteopathic manipulative treatment area of muscle energy as well as high velocity low amplitude (mobilization with impulse).

503 Osteopathic Manipulative Medicine - III
Summer. 1(0-2) Interdepartmental with Osteopathic Manipulative Medicine. Administered by Department of Osteopathic Manipulative Medicine. P:M: (OMM 502) R: Open only to students in the College of Osteopathic Medicine.
Students will use their palpatory skills as they learn the principles of functional (indirect) and myofascial release osteopathic manipulative treatment.

504 Osteopathic Manipulative Medicine - IV
Fall. 1(0-2) Interdepartmental with Osteopathic Manipulative Medicine. Administered by Department of Osteopathic Manipulative Medicine. P:M: (OMM 503) R: Open only to students in the College of Osteopathic Medicine.
Basic cranio-sacral osteopathic manipulative medicine. Exposure to various osteopathic approaches to the extremities.