

815. Concepts in Tumorigenesis
Spring of odd years. 2(2-0) P: BCH 462, PSL 432, PSL 460. R: Approval of department.
Examination and discussion of literature in tumorigenesis.

819. Principles of Drug-Tissue Interactions
Spring. 3(3-0) R: Approval of department. Not open to students with credit in PHM 820.
General principles relevant to the interaction of chemicals with biological systems.

820. Cellular and Molecular Mechanisms in Pharmacology and Toxicology
Summer. 3(3-0) P: (BCH 801 and BCH 802 and PHM 819) 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
Fall. 5(5-0) P: (PHM 820) R: Approval of department.
Comprehensive overview of drug and chemical actions on the major organ systems of intact humans and other mammals.

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

839. Systems Neuroscience
Spring of odd 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) 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)
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 or 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 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) 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: 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) P: 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.

Descriptions—Philosophy of Courses

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 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) P: 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) P: (PHL 210) or two other PHL courses.

Development of Platonic philosophy from the early Socratic Academy. Emphasis on the middle dialogues, especially the 'Republic'.

411. Aristotle

Spring. 4(4-0) P: (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.

412. Medieval Philosophy

Fall of even years. 3(3-0) P: (PHL 210) or two other PHL courses.

Medieval philosophy from the fourth to the sixteenth centuries, emphasizing the contributions of Augustine and Aquinas.

413. Continental Rationalism

Fall of odd years. 4(4-0) P: (PHL 211) or two other PHL courses.

The rationalists of the seventeenth century, with emphasis on Descartes, Spinoza and Leibniz.

414. British Empiricism

Fall of even years. 3(3-0) P: (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) P: (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) P: (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) P: (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. P: 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. P: 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. P: 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 Philosophical Logic

Spring of even years. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: (PHL 330 or MTH 472)

Selected topics from metalogic, model theory, artificial intelligence and deviant logics.

440. Central Issues in Ethics

Spring. 4(4-0) P: (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.

450. Topics in Social and Political Philosophy

Spring. 3(3-0) A student may earn a maximum of 9 credits in all enrollments for this course. P: (PHL 340 or PHL 350)

Political authority, individual liberty, aspects of social justice. Authors such as Plato, Hobbes, Locke, and Rawls.

460. Epistemology

Fall. 3(3-0) P: 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) P: 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) P: 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 dualism, behaviorism, criteriology, reductive and eliminative materialism, and functionalism.

463. Introduction to Cognitive Science

Spring. 3(3-0) Interdepartmental with Linguistics; and Psychology. P: (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; and 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) P: (PHL 330) or a 200 level mathematics or statistics course.

Structure of scientific theories and explanation. Causation, prediction, induction, confirmation, discovery, and scientific progress.

481. Topics in Science Studies

Spring. 3(3-0) P: Three science courses or two PHL courses.

Converging trends in philosophy, history, and sociology of science. Such topics as scientific rationality and objectivity, evolutionary epistemology, continental approaches, or feminist perspectives.

484. Philosophy of Biological Science

Spring. 3(3-0) P: Three courses in biological science 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) P: 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 empiricist, interpretive, and critical theory approaches.

486. Biotechnology in Agriculture: Applications and Ethical Issues

Spring of even years. 3(3-0) Interdepartmental with Horticulture; Crop and Soil Sciences; and Forestry. Administered by Horticulture. P: BS 111 or BOT 105. R: Not open to freshmen and 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) P: (PHL 330) or three courses in mathematics.

Nature of mathematical truth and knowledge. Theses of logicism, formalism, intuitionism, and conventionalism.

488. Philosophy of Physical Science
Fall of even years. 3(3-0) P: Three courses in physical science or two PHL courses. Philosophical problems of the physical sciences. Topics from such areas as quantum mechanics, space-time, classical mechanics, or relativity.

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: Completion of Tier I writing requirement. 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, Spring. 3(3-0) P: 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.

800. 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.

801. Teaching Philosophy
Spring. 3(3-0) R: Open only to Ph.D. students in Philosophy or approval of department.
Theoretical and pedagogical issues in teaching philosophy: the nature of philosophy, designing a course and syllabus, lecturing, leading discussions, designing assignments, evaluation, classroom dynamics, using technology, teaching various areas of philosophy.

810. Seminar in the History of Philosophy
Fall. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Major thinkers, themes, periods, or movements in the history of philosophy.

820. Seminar in Continental Philosophy
Fall of even years. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Major figures or themes in 19th and 20th century continental philosophy.

830. Seminar in Logic and the Philosophy of Language
Fall of odd years. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Selected topic in philosophy of language, philosophical logic, and metatheory.

840. Seminar in Value Theory
Spring. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Major figures, themes, or periods in ethics or aesthetics. Topics vary.

850. Seminar in Social and Political Philosophy
Spring of even years. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Major figures, themes, or periods in social and political philosophy. Topics vary.

860. Seminar in Metaphysics and Epistemology
Fall. 2 to 4 credits. A student may earn a maximum of 15 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Selected topics in metaphysics, epistemology, and philosophy of mind.

870. Seminar in Philosophy of Health Care
Fall. 2 to 4 credits. A student may earn a maximum of 15 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Ethical, political, theoretical, and methodological issues in medicine and health care.

880. Seminar in Philosophy of Science
Spring. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to graduate students in Philosophy or approval of department.
Selected topics in the philosophy of the special sciences, in the metatheory of science, and in the social studies of science.

890. Independent Study
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 20 credits in all enrollments for this course. R: Approval of department.
Special projects, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.

894. Practicum in Philosophy of Health Care
Fall, Spring. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: (PHL 344) R: Open only to graduate students in Philosophy or approval of department.
Study of ethical and policy issues in hospital and governmental agency settings.

899. Master's Thesis Research
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.
Directed research leading to a master's thesis in partial fulfillment of Plan A master's degree requirements.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 50 credits in all enrollments for this course. R: Approval of department.

PHYSICAL MEDICINE AND REHABILITATION PMR

Department of Physical Medicine and Rehabilitation College of Osteopathic Medicine

590. Special Problems
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
Each student works under faculty direction on an experimental, theoretical or applied problem in physical medicine and rehabilitation.

601. Physical Medicine and Rehabilitation Clerkship
Fall, Spring, Summer. 3 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. P: (IM 650 or concurrently) RB: UNITS I and II or concurrently.
Physical medicine and rehabilitation inpatient and ambulatory setting clinical experience, didactic sessions, case documentation and presentation, hospital rounds. Strong emphasis on evaluation of neuromusculoskeletal disorders and treatment of function deficits.

656. Neurology Clerkship
Fall, Spring, Summer. 1 to 20 credits. A student may earn a maximum of 30 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II.
Clinical exposure in neurology. Program structure developed to achieve proficiency in motor skills, aptitudes; comprehension of concepts and principles; patient evaluation, diagnosis, management, and therapy.
SA: IM 656