

Logic and Philosophy of Science (LPS)

Courses

LPS 29. Critical Reasoning. 4 Units.

Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.

Same as PHILOS 29.

(II and Vb).

LPS 30. Introduction to Symbolic Logic. 4 Units.

An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction, and semantic tableaux.

Same as LSCI 43, PHILOS 30.

(Vb)

LPS 31. Introduction to Inductive Logic. 4 Units.

Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning.

Same as PHILOS 31.

(II and Va).

LPS 40. The Nature of Scientific Inquiry. 4 Units.

Investigates the nature, scope, and status of scientific knowledge and the methods used to acquire it. Uses concrete historical examples from a variety of scientific fields to identify distinctive features of the scientific enterprise and explore their significance.

Same as PHILOS 41.

(II)

LPS 60. The Making of Modern Science. 4 Units.

Surveys the history of science and mathematics since the Scientific Revolution, examining central developments both chronologically and thematically, as well as investigating their significance for contemporary philosophical debates about the role and status of current scientific theories.

Same as HISTORY 60.

(II or IV).

LPS H81. What is Space? . 4 Units.

Historical, philosophical, scientific exploration of the concept of "space." Questions of interest include: What kind of a thing is space? How can we know what space is like? How is space different from time.

Restriction: Campuswide Honors Collegium students only.

(II)

LPS H83. Evolutionary Foundations of Human Moral Psychology. 4 Units.

Examines origin and function(s) of human moral psychology from an evolutionary point of view, drawing on theories and experimental findings from evolutionary biology, social psychology, developmental and comparative psychology, primatology, anthropology, and philosophy.

Restriction: Campuswide Honors Collegium students only.

(II or III).

LPS 91. The Philosophy of Sex. 4 Units.

Discusses the origins of biological sex, dynamics of sexual selection, sex differences in humans, and the construction of gender in human societies. Seeks to understand the role social values play in the creation of science.

Same as PHILOS 91.

Overlaps with LPS H91.

(III)

LPS H91. The Philosophy and Biology of Sex. 4 Units.

Covers the origins of biological sex, dynamics of sexual selection, the evolution and cultural creation of sexual behavior in humans, and the construction of gender in human societies.

Restriction: Campuswide Honors Collegium students only.

(II and III).

LPS H95. Jurisprudence and Constitutional Law. 4 Units.

Applies competing theories of the nature of law and legal reasoning to evaluate decisions of the U.S. Supreme Court in controversial areas of constitutional law such as free speech, privacy, sexual conduct, affirmative action, and political campaign contributions.

Restriction: Campuswide Honors Collegium students only.

(III)

LPS 100W. Writing Philosophy. 4 Units.

Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings.

Prerequisite: Satisfactory completion of the Lower-Division Writing requirement.

Same as PHILOS 100W.

Restriction: Upper-division students only.

(Ib)

LPS 104. Introduction to Logic. 4 Units.

Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction.

Same as LSCI 142, PHILOS 104.

LPS 105A. Introduction to Set Theory and Mathematical Reasoning. 4 Units.

An introduction to the basic working vocabulary of mathematical reasoning and proof. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, induction, and their applications to mathematical philosophy.

Same as LSCI 145A, PHILOS 105A.

LPS 105B. Metalogic. 4 Units.

Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löwenheim-Skolem theorems.

Prerequisite: LSCI 145A or LPS 105A or PHILOS 105A

Same as LSCI 145B, PHILOS 105B.

Overlaps with MATH 150.

LPS 105C. Undecidability and Incompleteness. 4 Units.

Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Gödel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic.

Prerequisite: LSCI 145B or LPS 105B or PHILOS 105B

Same as LSCI 145C, PHILOS 105C.

Concurrent with LPS 205C.

LPS 106. Topics in Logic . 4 Units.

Selected topics in mathematical or philosophical logic.

Prerequisite: (LPS 105A or PHILOS 105A or LSCI 145A) and (LPS 105B or PHILOS 105B or LSCI 145B) and (LPS 105C or PHILOS 105C or LSCI 145C)

Repeatability: Unlimited as topics vary.

Same as LSCI 106, PHILOS 106.

LPS 108. Topics in Induction, Probability, and Decision Theory. 4 Units.

Selected topics in induction, probability, and decision theory.

Repeatability: Unlimited as topics vary.

Same as PHILOS 108.

LPS 113. Topics in Modern Philosophy. 4 Units.

Focuses on the works of central philosophical figures of modern Philosophy (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures.

Repeatability: Unlimited as topics vary.

Same as PHILOS 113.

LPS 115. Topics in History of Analytic Philosophy. 4 Units.

Review of central theories or figures in the history of analytic philosophy. Emphasis on writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge.

Repeatability: Unlimited as topics vary.

Same as PHILOS 115.

LPS 120. Topics in Metaphysics. 4 Units.

Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem).

Repeatability: Unlimited as topics vary.

Same as PHILOS 120.

LPS 121. Topics in the Theory of Knowledge . 4 Units.

One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge.

Repeatability: Unlimited as topics vary.

Same as PHILOS 121.

LPS H123. What is Disease?. 4 Units.

Explores philosophical issues associated with scientific efforts to understand and explain disease.

Restriction: Campuswide Honors Collegium students only.

(II)**LPS H125. What Is Time? . 4 Units.**

Engages the question "what is time?" by drawing on physics, philosophy, fiction, film, and psychology. Organized around understanding and addressing the tension between time as represented in physics and our immediate temporal experience.

Restriction: Campuswide Honors Collegium students only.

(III)**LPS 135A. The Scientific Revolution. 4 Units.**

An examination of early modern European science from 1500-1700. Includes primary readings from central figures (Copernicus, Harvey, Bacon, Descartes, et al.); themes include the impact of printing, humanism, patronage, technology, and discussion of the term "revolution" in this context.

Same as HISTORY 135A, PHILOS 135A.

LPS 140. Topics in Philosophy of Science. 4 Units.

Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation.

Repeatability: Unlimited as topics vary.

Same as PHILOS 140.

LPS 141B. Geometry and Spacetime. 4 Units.

An examination of the foundations of the special theory of relativity, with emphasis on the geometry of Minkowski spacetime, and its relation to both Euclidean and non-Euclidean (hyperbolic) plane geometries.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHILOS 141B.

LPS 141D. Probability and Determinism. 4 Units.

An examination of a cluster of interrelated issues concerning probability, determinism, logic, and the foundations of quantum mechanics.

Prerequisite: MATH 2D and (MATH 3A or MATH 6G)

Same as PHILOS 141D.

LPS H141. Honors Philosophy of Quantum Mechanics. 4 Units.

An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory.

Overlaps with LPS 141C.

Restriction: Campuswide Honors Collegium students only.

LPS 143. Topics in Philosophy of Psychology. 4 Units.

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHILOS 143, PSYCH 123P.

Restriction: Philosophy Majors have first consideration for enrollment. Psychology Majors have first consideration for enrollment.

LPS 144. Topics in Philosophy of Social Science. 4 Units.

Selected topics in the philosophy of the social sciences, e.g.: Is their goal to understand behavior or to predict and control it? Are they normative and the natural sciences not? Do they incorporate philosophical doctrines about language and mind?.

Repeatability: Unlimited as topics vary.

Same as PHILOS 144.

LPS 145. Topics in Philosophy of Language. 4 Units.

Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts.

Repeatability: Unlimited as topics vary.

Same as LSCI 141, PHILOS 145.

LPS 147. Topics in Philosophy of Mathematics. 4 Units.

Selected historical and contemporary topics in the philosophy of mathematics, e.g., mathematical truth and ontology, mathematical knowledge, the nature and role of proof, the workings of mathematics in application.

Repeatability: Unlimited as topics vary.

Same as PHILOS 147.

LPS 199. Independent Study. 1-4 Units.

Independent research with Logic and Philosophy of Science faculty.

Repeatability: May be taken for credit for 12 units.

LPS 205A. Introduction to Set Theory and Mathematical Reasoning. 4 Units.

An introduction to the basic working vocabulary of mathematical reasoning and proof. Topics include sets, Boolean operations, ordered n-tuples, relations, functions, induction, and their applications to mathematical philosophy.

Same as PHILOS 205A.

LPS 205B. Metalogic. 4 Units.

Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems.

Prerequisite: PHILOS 205A or LPS 205A. PHILOS 205A with a grade of B- or better. LPS 205A with a grade of B- or better

Same as PHILOS 205B.

LPS 205C. Undecidability and Incompleteness. 4 Units.

Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic.

Prerequisite: PHILOS 205B or LPS 205B. PHILOS 205B with a grade of B- or better. LPS 205B with a grade of B- or better

Same as PHILOS 205C.

Restriction: Graduate students only.

Concurrent with LPS 105C.

LPS 206. Topics in Logic . 4 Units.

Studies in selected areas of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 206.

LPS 213. Topics in Modern Philosophy. 4 Units.

Studies in selected areas of modern philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 213.

LPS 215. Topics in Analytic Philosophy. 4 Units.

Studies in selected areas of analytic philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 215.

LPS 220. Topics in Metaphysics. 4 Units.

Studies in selected areas of metaphysics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 220.

LPS 221. Topics in Epistemology. 4 Units.

Studies in selected areas of epistemology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 221.

LPS 221A. Medical Epistemology. 4 Units.

Analysis of epistemological issues concerning medical research and healthcare. Topics may include medical evidence, transmission of medical knowledge in the doctor-patient interaction, medical expertise, epistemology of medical disagreement, classification of illness, well-being, philosophy of pain, or medical decision making.

Same as PHILOS 221A.

Restriction: Graduate students only.

LPS 232. Topics in Political and Social Philosophy. 4 Units.

Studies in selected areas of political and social philosophy. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 232.

LPS 240. Topics in Philosophy of Science. 4 Units.

Studies in selected areas of philosophy of science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 240.

LPS 241. Topics in Philosophy of Physics. 4 Units.

Studies in selected areas of philosophy of physics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 241.

LPS 242. Topics in Philosophy of Biology. 4 Units.

Studies in selected areas of philosophy of biology. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 242.

LPS 243. Topics in Philosophy of Psychology. 4 Units.

Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience.

Repeatability: Unlimited as topics vary.

Same as PHILOS 243.

LPS 244. Topics in Philosophy of Social Science. 4 Units.

Studies in selected areas of philosophy and social science. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 244.

LPS 245. Topics in Philosophy of Language. 4 Units.

Studies in selected areas of philosophy of language. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 245.

LPS 246. Topics in Philosophy of Logic. 4 Units.

Studies in selected areas of philosophy of logic. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 246.

LPS 247. Topics in Philosophy of Mathematics. 4 Units.

Studies in selected areas of philosophy of mathematics. Topics addressed vary each quarter.

Repeatability: Unlimited as topics vary.

Same as PHILOS 247.

LPS 289. Logic and Philosophy of Science Workshop. 1-4 Units.

A two- or three-quarter-long workshop on selected topics in logic and philosophy of science.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be repeated for credit unlimited times.

LPS 298. Independent Study. 4-12 Units.

Independent research with Logic and Philosophy of Science Faculty.

Repeatability: May be taken for credit for 12 units.

LPS 299. Directed Research. 1-12 Units.

Directed study with Logic and Philosophy of Science Faculty.

Repeatability: May be repeated for credit unlimited times.

LPS 399. University Teaching. 4-12 Units.

Required of and limited to Teaching Assistants.

Grading Option: Satisfactory/unsatisfactory only.

Repeatability: May be taken for credit for 12 units.