Department of Philosophy

Richard Scheines, Department Head
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The Department of Philosophy was founded in 1985 and reflects the tradition of philosophy as a central discipline in the humanities. The department has achieved an international reputation through the acclaimed research of its members and its innovative educational programs, not only in traditional topics such as ethics, philosophy of mind, logic, and theory of knowledge, but in such contemporary and applied areas as automated theorem proving, machine learning, the foundations of statistics, causal discovery, forward learning theory, game and decision theory, conflict resolution, and business ethics.

Philosophy thrives through contact with other disciplines. Interdisciplinary work, a traditional strength of the Carnegie Mellon community, is vital to the department and is reflected in the courses we offer, many of which incorporate substantive material from a range of other disciplines. Some courses are actually team-taught with professors from other departments and schools around the university.

Our programs are designed to develop our students' analytical sophistication and their practical and theoretical skills in specializations outside the department (see the sample curricula below). The department welcomes and, indeed, encourages minors and additional majors from other disciplines who are interested in reflecting on the foundation of their own subjects. The department offers two different undergraduate major programs, and jointly sponsors two interdepartmental majors: Ethics, History, and Public Policy (with the Department of History), and Linguistics (with English, Modern Languages, and Psychology):

- the B.A. or B.S. in Ethics, History, and Public Policy (inderdisciplinary major with Department of History)
- the B.S. in Logic and Computation
- the B.A. in Philosophy
- the B.A. in Linguistics (interdisciplinary major with Departments of English, Modern Languages, and Psychology)

The major in Logic and Computation is perhaps the most non-traditional of the department's majors. It offers students a firm background in computer science, together with a solid grounding in logic, philosophy, and mathematics. This reflects the department's commitment to the use of formal, analytic methods in addressing philosophical issues. A flexible system of electives allows students to focus their efforts in any of a wide range of disciplines, from engineer-ing to the fine arts. As a capstone to the program, students engage in original research in their senior year, and write a thesis under the direction of an advisor.

The department also sponsors four minor programs:

- the minor in Ethics
- the minor in Linguistics
- the minor in Logic and Computation
- the minor in Philosophy

Finally, the department offers two master's programs directly extending the departmental majors. Both programs are coordinated with and build on the undergraduate programs, so that majors can complete the requirements for the master's degree in one additional year:

- the M.S. in Logic and Computation
- the M.A. in Philosophy

Students who choose the appropriate specialized track in the Logic and Computation major (namely, sample 2 of the Curricula listed below) can be admitted to the M.S. program in Language and Information Technology offered by the School of Computer Science. To complete the discussion of departmental programs, it should be mentioned that the department sponsors as part of the Program in Pure and Applied Logic (offered jointly with the Departments of Computer Science and Mathematics) a Ph.D. in Logic, Computation, and Methodology.

The Major in Ethics, History, and Public Policy

Andy Norman, Undergraduate Advisor

This is an interdepartmental major that is jointly sponsore dby the Departments of History and of Philosophy. Preparing students for leadership positions is a vital goal of colleges and universities in every democratic and technologically advanced society. The intellectual challenges facing public and private sector leaders expand dramatically each year, and there is a compelling need in twenty-first-century America for broadly educated, ethically sensitive, and technically skilled public servants. They will have to demonstrate sophisitcated interdsciplinary knowledge, deep understanding of how modern-day problems have evolved, and clear, rational criteria for ethical decision-making. The major in Ethics, History, and Public Policy seeks to provide students with a solid humanistic foundation for developing such high-level leadership capabilities. It also provides ample room for specialization, technical skill development, and internship experience in a wide range of policy areas. For a detailed discussion of the curriculum and the flexible tracks, consult the H&SS Interdepartmental Majors section of the catalog.

The Major in Linguistics

Mandy Simons, Director

Linguistics is the study of human language, and encompasses a broad spectrum of research questions, approaches, and methodologies. Some linguists are concerned with the cognitive aspects of language learning, production, and comprehension; some are concerned with language as a social and cultural phenonmenon; others engage in the analysis of linguistic form and meaning, some from a functional and others from a formal perspective. There are also computational approaches to linguistics with both applied and theoretical goals.

The Major in Linguistics reflects the multidisciplinary character of the field and of the Linguistics faculty here at Carnegie Mellon, combining course offerings from the departments of English, Modern Languages, Philosophy, Psychology, and the Language Technologies Institute. The program provides students with the fundamental tools of linguistic analysis while maintaining a focus on the human context in which language is learned and used. After completing their core courses, students can follow a concentration in one of three areas: Language in its Social Context, Language and Mind, or Language and Communication. Various specialized electives, including Language Technology courses, are available to students with the appropriate preparation. Students can choose to focus fairly narrowly on an area of particular interest, or to explore it more widely.

The Major in Linguistics is available as either a primary major or an additional major. It is an ideal choce for students with a general interest in theor own or other languages, and combines well thematically with studies in any of the departments represented in the major. For a detailed discussion of the curriculum and the flexible tracks, consult the H&SS Interdepartmental Majors section of the catalog.

The Major in Logic and Computation

Horacio Arlo-Costa, Director

The Logic and Computation curriculum takes advantage of the preparation provided by the H&SS General Education Program in mathematics, philosophy, psychology, and statistics. It is flexible in that it permits students to focus on any of a number of areas including (but not limited to):

- computer science;
- language and information technology;
- artificial intelligence and cognitive science;
- logic and the foundations of mathematics;
- methodology and philosophy of science.

Students in the program take a common core of courses in logic, methodology, and computer science, together with an associated seminar in their senior year. The individual focus is achieved by selecting a sequence of four advanced and closely related courses. It is in this area of focus (or specialization) that students write their senior thesis under the supervision of a faculty member. A number of sample curricula are presented below.

The resulting education in logic, analytic philosophy, mathematics, statistics, and computer science enables students to pursue professional careers or graduate study. The analytic and communica-tion skills developed in the major support a wide range of career choices, including those among the fields of technology, business, and law. Fields of graduate study for which students are well prepared include, for example, computer science, cognitive science, philosophy, logic, and linguistics.

Students who are interested in pursuing this major, or who are pursuing it already, should take note of the Cognitive Science major in the Department of Psychology. That major is so closely related that it is not difficult to pursue it as an additional major, and it provides an intellectually exciting complement.

Curriculum

Logic and Computation is a B.S. degree. In their freshman and sophomore years, students are expected to take four courses that provide preparation in logic, computer science, mathematics, and statistics: Programming Fundamentals (15-111), Concepts of Mathematics (21-127), Statistical Reasoning (36-201), Arguments and Mathematical Inquiry (80-211). This last course is already part of the major's Core Requirements, but should be taken no later than the spring of the sophomore year. This also applies to the computer science sequence 15-211/212.

NOTE: Students should complete the prerequisites before their junior year. It is strongly recommended that students take Arguments and Mathematical Inquiry no later than the spring of their sophomore year and, if possible, also Fundamental Data Structures and Algorithms and Principles of Programming. However, with suitable planning and advice from the program director, it is possible to complete the program in two years, beginning in the junior year.

The course requirements for the major consist of six core courses, four electives, and one seminar. The core courses provide comprehensive background in logic, computability, and analytic philosophy. Logic and Computation (80-310) and Minds, Machines, and Knowledge (80-300) must be taken no later than the fall of the junior year. Four advanced electives are chosen in the area of focus, and should support independent research towards fulfilling the senior thesis requirement. In their senior year, students present and discuss their research in the thesis seminar.

Prerequisites — 28 units*

15-111 Intermediate/Advanced Programming (10 units)
or
15-200 Advanced Programming/Practicum
21-127 Concepts of Mathematics
36-201 Statistical Reasoning

Logic and Computation Core — 69 units*

80-211 Arguments and Mathematical Inquiry
80-300 Minds, Machines, and Knowledge
80-310 Logic and Computation
80-311 Computability and Incompleteness
80-511 Thesis seminar
15-211 Fundamental Data Structures and Algorithms
15-212 Principles of Programming

*Only 45 units are unique to the major; 15-211 and 15-212 count toward total units for the General Education Program, DCR6, Science and Technology.

Logic and Computation Electives — 36 units

Bearing in mind prerequisites, Logic and Computation majors must complete four advanced courses in areas that use logical and computational tools, such as philosophy, computer science, linguistics, mathematical logic, psychology, or statistics. The sequence of courses, mostly at the 300-level, must be selected in consultation with the program director.

Sample Curricula

Here are five samples of Logic and Computation curricula (beyond the core courses), each reflecting a different emphasis.

Sample 1. A student interested in Computer Science might take the following courses:
80-315 Modal Logic
80-413 Category Theory
80-316 Causation, Probability and Artificial Intelligence
15-312 Programming Languages: Design and Processing

Sample 2. A student interested in Language and Information Technology might take the following courses:
80-280 Linguistic Analysis
80-306 Meaning in Language
80-480 Linguistic Theory
80-682 Introduction to Language Technologies

Sample 3. A student interested in Artificial Intelligence and Cognitive Science might take the following courses:
80-314 Logic in Artificial Intelligence
80-315 Modal Logic
80-316 Causation, Probability and Artificial Intelligence
85-412 Production System Models of Thought

Sample 4. A student interested in Logic and the Foundations of Mathematics might consider the following courses:
80-312 Philosophy of Mathematics
80-254 Analytic Philosophy
80-411 Proof Theory
80-413 Category Theory

Sample 5. A student interested in Methodology might consider the following courses:
80-220 Philosophy of Science
80-221 Philosophy of Social Science
80-321 Causation, Law, and Social Policy
36-309 Experimental Design

Logic and Computation Degree Requirements (min.) 360 units

Logic and Computation as a Second Major

The Logic and Computation major is also suitable as a second major for students in H&SS or for students in other colleges within the university. Non-H&SS students interested in an additional major in Logic and Computation need to take only those courses in the H&SS General Education Program that are prerequisites to courses required in the major; all other H&SS General Education requirements are waived for these students. Depending on the student's back-ground, the requirements of the second major in Logic and Computa-tion can be fulfilled with as few as five additional courses. However, the department limits the courses that may be 'double counted'; the core courses in the Philosophy department may not be double counted.

The M.S. Program in Logic and Computation

The Department of Philosophy also offers a graduate M.S. degree in Logic and Computation, which culminates with the writing of a master's thesis. It is ordinarily a two-year program, but students in the Logic and Computation major are able to complete the additional requirements in one year. Interested students are invited to contact the department for further information and apply to the program in their senior year. Details can be found on the department's homepage: http://hss.cmu.edu/philosophy/

The Major in Philosophy

Mara Harrell, Director

The Major in Philosophy is intended to be flexible and to facilitate double majors in other fields (including majors with a strong profes-sional focus). It provides students with a broad humanities education and sharpens their analytical skills. We encourage, but do not require, students to choose a thematic concentration through their electives. Sample curricula emphasizing Pre-Law, Metaphysics and Epistemology, Ethics and Social Philosophy, and Philosophy of Mind are suggested below. However, alternative emphases can be proposed and approved by the Director. The Major in Philosophy is a B.A. degree.

Curriculum

In addition to the general education requirements of the student's college, Philosophy majors and double majors must complete nine Philosophy courses in the Areas listed below. Only two of these nine courses may be at the 100-level, and (for H&SS students) only one of them may be counted also as satisfying the College's General Education requirements (DCR 1 through 4). Students are to choose one course out of each of the Areas 1-4, two courses out of Area 5, and may freely select three courses in Area 6. These nine courses can be taken during the junior and senior year.

Area 1: Values and Normative Theory 9 units

One of the following:
80-x30 through 80-x34 Ethics/Ethical Theory
80-x35 through 80-x39 Social/Political Philosophy
80-x40 through 80-x49 Applied/Professional Ethics

Area 2: Philosophy of Mind/Language/Metaphysics 9 units

One of the following:
80-x70 through 80-x79 Philosophy of Mind/Metaphysics
80-x80 through 80-x89 Philosophy of Language

Area 3: Logic/Philosophy of Mathematics 9 units

One course from (80-x10 through 80-x19)

Area 4: Epistemology/Methodology 9 units

One of the following:
80-x00 through 80-x09 Epistemology/Methodology
(not counting 80-100 through 80-109)
80-x20 through 80-x29 Philosophy of Science

Area 5: History of Philosophy 18 units

Two of the following:
80-250 through 80-259 History of Philosophy
80-150 Nature of Reason
80-226 Revolutions in Science

Area 6: Electives 27 units

Three other philosophy courses, or appropriate courses from other departments, with the permission of the Director.

Sample Curricula

Here are four sample curricula, reflecting different emphases.

1. A sample Pre-Law program is:

Area 1	80-236	Philosophy and Law
Area 2	80-180	Nature of Language
Area 3	80-211	Logic and Mathematical Inquiry
Area 4	80-208	Critical Thinking
Area 5	80-150	Nature of Reasoning
	80-250	Ancient Philosophy
Area 6	80-242	Conflict and Dispute Resolution
	80-321	Causation, Law, and Social Policy
	80-348	Health, Development and Human Rights
	80-447	Global Justice

2. For an emphasis on Philosophy of Science a student might take:

Area 1	80-230	Ethical Theory
Area 2	80-271	Philosophy and Psychology
Area 3	80-211	Logic and Mathematical Inquiry
Area 4	80-220	Philosophy of Science
	or	
	80-221	Philosophy of Social Science
Area 5	80-250	Ancient Philosophy
	82-226	Revolutions in Science
Area 6	80-222	Measurement and Methodology
	80-322	Philosophy of Physics
	80-323	Philosophy of Biology

3. For an emphasis on Ethics and Social Philosophy a student might take:

Area 1	80-230	Ethical Theory
Area 2	80-276	Philosophy of Religion
Area 3	80-110	Nature of Mathematical Reasoning
Area 4	80-221	Philosophy of Social Science
	or	
	80-321	Causation, Law, and Social Policy
Area 5	80-250	Ancient Philosophy
Area 6	80-321	Causation, Law, and Social Policy

4. For an emphasis on Philosophy of Mind a student might take:

Area 1	80-130	Introduction to Ethics
Area 2	80-270	Philosophy of Mind
Area 3	80-211	Logic and Mathematical Inquiry
Area 4	80-201	Epistemology
Area 5	80-251	Modern Philosophy
	80-254	Analytic Philosophy
Area 6	80-271	Philosophy and Psychology
	80-300	Minds, Machines, and Knowledge
	80-316	Causation, Probability & Artificial Intelligence

Additional Major

Students who want an additional major in Philosophy must fulfill the same departmental requirements as primary majors in Philosophy.

The M.A. Program in Philosophy

The Department of Philosophy also offers a graduate M.A. degree in Philosophy, which culminates with the writing of a master's thesis. It is ordinarily a two-year program, but students in the Philosophy major are able to complete the additional requirements in one year. Interested students are invited to visit the department's homepage for further information: www.hss.cmu.edu/philosophy/.

Philosophy Department Minors

All majors in the Department allow for minors; in addition, there is a Minor in Ethics and an interdepartmental minor in Linguistics. The requirements are again designed to be flexible and to allow students to tailor courses to their special interests, while providing some breadth.

The Minor in Ethics

With the explosive growth of science and technology have come both new possibilities and new problems. Developments in medicine, in biology, in chemistry, in nuclear engineering or in computer science all have costs as well as benefits, and they present us with many hard choices. Some of the hardest of these new problems are moral problems.

The Philosophy Department's Minor in Ethics introduces students to central ethical concepts and theories proposed and defended by the great philosophers of the past; it provides an understanding of how these theories and concepts can be applied to practical problems. This background in ethical theory and its applications should help students to respond more sensitively and appropriately to the new and unavoidable ethical problems that businesses, unions, and branches of government must face.

Ethics Core Courses 27 units

Complete three courses from any of the following areas with at least two courses at the 200-level or higher.

80-x30 through 80-x34 Ethics / Ethical Theory
80-x35 through 80-x39 Social / Political Philosophy
80-x40 through 80-x49 Applied / Professional Ethics

Ethics Electives 18 units

Complete two courses at the 200-level or higher.

The Minor in Linguistics

The Interdepartmental Minor in Linguistics is jointly sponsored with the departments of English, Modern Languages, and Psychology. It synthesizes the linguistics related offerings in these departments and provides students with an academic experience that reflects both the interdisciplinary character of the subject and its cross-departmental representation in H&SS. Students who wish to receive a minor in Linguistics must complete six courses. For a detailed discussion of the curriculum and the flexible electives, consult the H&SS Interdisciplinary Minors section of the catalog.

The Minor in Logic and Computation

The Minor in Logic and Computation provides students with general course work in logic, the theory of computation, and philosophy. Students must complete six courses, among them the following three core courses.

Logic and Computation Core Courses 27 units

80-211 Logic and Mathematical Inquiry
or
80-210 Logic and Proofs
80-300 Minds, Machines, and Knowledge
80-310 Logic and Computation
or
80-311 Computability and Incompleteness

Logic and Computation Electives 27 units

Students must take two courses in the Philosophy Department at the 300-level or higher, in subjects related to logic and computation, and an additional course at the 300-level or higher in an area that uses logical and computational tools, such as philosophy, computer science, linguistics, mathematics, psychology, or statistics. The choice of electives must be approved by the program director.

The Minor in Philosophy

The Minor in Philosophy allows students to complement their primary majors with a broad philosophical grounding.

Logic/Methodology Requirements 9 units

Complete one course:
80-x10 through 80-x19 Philosophy of Logic/Mathematics
or
80-x20 through 80-x29 Philosophy of Science

History of Philosophy Requirements 18 units

Complete two courses:
80-250 through 80-259 History of Philosophy
80-150 Nature of Reason
80-226 Revolutions in Science

Philosophy Electives 18 units

Complete two courses in the Philosophy Department at the 200-level or higher.

The Honors Program

The H&SS Senior Honors Program provides recognition of outstanding performance by students majoring in Philosophy, Logic and Computation or Ethics, History, and Public Policy. Students have the opportunity to develop their skills and to apply their knowledge through completion of an honors thesis in their senior year. By completing the thesis, students earn 18 units of credit and qualify for graduation with College Honors. To qualify for the honors program, students must maintain a quality point average of at least 3.50 in the major and 3.25 overall, and be invited by the department to become a participant.

Undergraduate Research Fellows

Qualified upper level undergraduates, preferably majors in one of the Philosophy Department's programs, may apply to serve in their junior or senior years as fellows in the Laboratory for Symbolic and Educational Computing. Applications are reviewed in the fall. Follow the link to LSEC from the Department's home page: www.hss.cmu.edu/philosophy.

Faculty

HORACIO ARLO-COSTA, Associate Professor of Philosophy — Ph.D., Columbia University; Carnegie Mellon, 1998—.

JEREMY AVIGAD, Professor of Philosophy — Ph.D., University of California, Berkeley; Carnegie Mellon, 1996—.

STEVEN AWODEY, Professor of Philosophy — Ph.D., University of Chicago; Carnegie Mellon, 1997—.

ROBERT CAVALIER, Teaching Professor of Philosophy— Ph.D., Duquesne University; Carnegie Mellon, 1987—.

DAVID DANKS, Assistant Professor of Philosophy — Ph.D., University of California, San Diego, Carnegie Mellon, 2003—.

CLARK GLYMOUR, Alumni University Professor of Philosophy—. Ph.D., Indiana University; Carnegie Mellon, 1984—.

MARALEE HARRELL, Associate Teaching Professor in Philosophy — Ph.D., University of California, San Diego, Carnegie Mellon, 2003—.

NICOLE HASSOUN, Assistant Professor of Philosophy — Ph.D., University of Arizona; Carnegie Mellon, 2007—.

KEVIN T. KELLY, Professor of Philosophy — Ph.D., University of Pittsburgh; Carnegie Mellon, 1985—.

ALEX LONDON, Associate Professor of Philosophy — Ph.D., University of Virginia; Carnegie Mellon, 2000—.

JOSEPH RAMSEY, Director of Research Computing — Ph.D., University of California, San Diego; Carnegie Mellon, 2006—.

RICHARD SCHEINES, Professor of Philosophy — Ph.D., University of Pittsburgh; Carnegie Mellon, 1987—.

DANA S. SCOTT, Hillman University Professor of Mathematical Logic, Computer Science and Philosophy (Emeritus) — Ph.D., Princeton University; Carnegie Mellon, 1981—.

TEDDY I. SEIDENFELD, Herbert A. Simon Professor of Philosophy and Statistics — Ph.D., Columbia University; Carnegie Mellon, 1985—.

WILFRIED SIEG, Patrick Suppes Professor of Philosophy — Ph.D., Stanford University; Carnegie Mellon, 1985—.

MANDY SIMONS, Associate Professor of Philosophy — Ph.D., Cornell University; Carnegie Mellon, 1998 —.

PETER L. SPIRTES, Professor of Philosophy — Ph.D., University of Pittsburgh; Carnegie Mellon, 1987—.