PROGRAM IN SYMBOLIC SYSTEMS

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Courses given in the Program in Symbolic Systems have the subject code SYMBSYS. For a complete list of subject codes, see Appendix B.

Both human beings and computers can manipulate symbols. This observation lies at the heart of Symbolic Systems, an interdisciplinary program focusing on the relationship between natural and artificial systems that represent, process and act on information. Computer programs, natural languages, the human mind, and the Internet are all examples of symbolic systems. As such, they all embody concepts whose study forms the core of the Symbolic Systems curriculum: concepts such as computation, representation, communication, and intelligence. A body of knowledge and theory has developed around these notions, from disciplines like philosophy, computer science, linguistics, psychology, statistics, neurobiology, and communication. Since the invention of computers, researchers have been working across these and other disciplines to study questions such as: In what ways are computers and computer languages like humans and their languages? How can the interaction between people and computers be made easier and more beneficial? Can we build computers and robots that think and feel?

The Symbolic Systems Program (SSP) offers an opportunity to explore these issues. The core requirements include courses in symbolic logic, the philosophy of mind, formal linguistics, cognitive psychology, programming, the mathematics of computation, statistical theory, artificial intelligence, and interdisciplinary approaches to cognitive science. The core courses are designed to prepare students with the vocabulary, theoretical background, and technical skills needed for more concentrated study and research at the advanced undergraduate and graduate levels. Most of the courses in SSP are drawn from affiliated departments. Courses designed specifically for the program are aimed at integrating and supplementing topics covered by the department-based offerings. The curriculum includes humanistic approaches to questions about language and intelligence, as well as training in science and engineering.

SSP offers both B.S. and M.S. degree programs. Both programs require students to master a common core of required courses, and to choose an area of specialization.

UNDERGRADUATE PROGRAMS

BACHELOR OF SCIENCE

The program leading to a B.S. in Symbolic Systems provides students with a core of concepts and techniques, drawing on faculty and courses from various departments. The curriculum prepares students for advanced training in the interdisciplinary study of language and information, or for postgraduate study in any of the main contributing disciplines. It is also excellent preparation for employment immediately after graduation.

Symbolic Systems majors must complete a core of required courses plus a concentration consisting of six additional courses. All major courses are to be taken for letter grades unless an approved course is offered satisfactory/no credit only. All core courses must be passed with a grade of 'C-' or better. Students who receive a grade lower than this in a core course must alert the program of this fact, so that a decision can be made about whether the student should continue in the major.

CORE REQUIREMENTS

In order to graduate with a B.S. in Symbolic Systems, a student must complete the following requirements. (Please note that some of these courses have other courses as prerequisites. Students are responsible for completing each course's prerequisites before they take it.)

1. *Cognitive Science*: either SYMBSYS 100. Introduction to Cognitive Science; *or* one of the following:
   CS 378. Phenomenological Foundations of Cognition, Language, and Computation
   LINGUIST 237/CS 224N. Natural Language Processing
   PHIL 189. Philosophical Applications of Cognitive Science
   PSYCH 131. Language and Thought
2. *Computer Programming*:
   a) CS 106A. Programming Methodology, and 106B. Programming Abstractions; *or* 106X. Programming Methodology and Abstractions (Accelerated); and
   b) CS 107. Programming Paradigms
3. *Discrete Structures*: CS 103A. Discrete Mathematics for Computer Science, and 103B. Discrete Structures; *or* 103X. Discrete Structures (Accelerated)
4. *Logic*: PHIL 160A. First-Order Logic
5. *Statistics/Probability*: one of the following:
   ECON 102A. Introduction to Statistical Methods (Postcalculus) for Social Scientists

EE 178. Introduction to Probability and Statistics
MATH 151. Introduction to Probability Theory
MSE 120. Probabilistic Analysis
STATS 60/PSYCH 10. Introduction to Statistical Methods (Precalculus)
STATS 116. Theory of Probability*

6. *Philosophical Foundations*: PHIL 80. Mind, Matter, and Meaning
7. *Cognitive Psychology*: PSYCH 40. Introduction to Cognitive Psychology
8. *Formal Linguistics*:
   a) LINGUIST 120. Introduction to Syntax; *and*
   b) LINGUIST 130A. Introduction to Linguistic Meaning; *or* one Linguistics course from the following:
      LINGUIST 130B. Introduction to Lexical Semantics
      LINGUIST 230A. Introduction to Semantics and Pragmatics
9. *Artificial Intelligence:* CS 121. Introduction to Artificial Intelligence; *or* 221. Artificial Intelligence: Principles and Techniques
10. *Turing Computability:*† one of the following:**
    CS 103B. Discrete Structures
    CS 154. Introduction to Automata and Complexity Theory
    PHIL 160B. Computability and Logic
    SYMBSYS 100. Introduction to Cognitive Science
11. *Advanced Small Seminar:*** an upper-division, limited-enrollment seminar drawing on material from other courses in the core. Courses listed under Symbolic Systems Program offerings with numbers from SYMBSYS 201 through 209 are acceptable, as are other courses which will be announced at the beginning of each academic year.

* This option is less recommended and may limit which concentrations can be completed.
† CS 103X does not fulfill this requirement.
** A course taken to fulfill one of these requirements can also be counted toward another requirement, as part of either the core or a student's concentration (see below).

CONCENTRATION AREAS

In addition to the core requirements listed above, the Symbolic Systems major requires each student to complete a concentration consisting of six courses that are thematically related to each other. Students select concentrations from the list below or design others in consultation with their advisers.

Applied Logic
Artificial Intelligence
Cognition
Computer Music
Decision Making and Rationality
Learning
Human-Computer Interaction
Natural Language
Neurosciences
Philosophical Foundations

MINORS

Students may minor in Symbolic Systems by completing either item 1 or item 2 below.

1. One course in each of the following core areas (please note that several of these courses have prerequisites):
   a) *Cognition*: SYMBSYS 100* or PSYCH 40
   b) *Logic and Computation*: PHIL 159 or 160A, or CS 103A and 103B, 103X, or 154
   c) *Computer Programming*: CS 106A and 106B, or 106A and 106X, or 107
   d) *Philosophical Foundations*: SYMBSYS 100* or PHIL 80
   e) *Formal Linguistics*: LINGUIST 120, 130A, or 130B
   f) *Artificial Intelligence*: CS 121 or 221
2. SYMBSYS 100. plus an interdisciplinary SSP concentration listed in the program booklet available from the program office, or on the SSP web site at http://www.stanford.edu/dept/symbol/. To qualify, the selection of courses used for the minor must be interdisciplinary; i.e., it must either include courses from at least three departments, or include more than one course from each of two departments.

*SYMBSYS 100 may not be counted for both areas 'a' and 'd'.

UNDERGRADUATE RESEARCH

The program strongly encourages all SSP majors to gain experience in directed research by participating in faculty research projects or by pursuing independent study. In addition to the Symbolic Systems Honors Program (see below) the following avenues are offered.

1. *Summer Internships:* students work on SSP-related faculty research projects. Application procedures are announced in the winter quarter for SSP majors.
2. *Research Assistantships:* other opportunities to work on faculty research projects are typically announced to SSP majors as they arise during the academic year.
3. *Independent Study*: under faculty supervision, students work on independent projects. For course credit they may enroll in SYMBSYS 196.

Contact SSP for more information on any of these possibilities, or visit the program's web site at http://www.stanford.edu/dept/symbol. In addition, the Undergraduate Research Opportunities office on campus offers numerous grants and scholarships supporting student research projects at all levels; see http://uro.stanford.edu.

HONORS PROGRAM

Seniors in SSP who are in good academic standing can graduate with honors by completing an honors thesis under the supervision of a faculty member. Course credit for the honors project may be obtained by registering for SYMBSYS 190 (Honors Tutorial) for any quarters while a student is working on an honors project. Juniors who are interested in doing an honors project during their senior year are strongly advised to take SYMBSYS 91 (Junior Honors Seminar). SYMBSYS 191 (Senior Honors Seminar) is recommended for honors students during the senior year. Contact SSP or visit the program's web site for more information on the honors program, including deadlines and policies.

COTERMINAL BACHELOR'S AND MASTER'S DEGREES

Many SSP majors also complete coterminal M.S. or M.A. degrees in affiliated departments. In addition to the Symbolic Systems M.S. program (see below), the Department of Philosophy offers a special Symbolic Systems track for interdisciplinary graduate level work.

GRADUATE PROGRAMS

The University's basic requirements for the M.S. and Ph.D. degrees are discussed in the "Graduate Degrees" section of this bulletin.

MASTER OF SCIENCE

The M.S. degree in Symbolic Systems is designed to be completed in the equivalent of one academic year by coterminal students or returning students who already have a B.S. degree in Symbolic Systems. Admission to the program is currently limited to Stanford undergraduates or those who have completed the B.S. in Symbolic Systems at Stanford. Admission is competitive, providing a limited number of students with the opportunity to pursue course and project work, in consultation with a faculty adviser who is affiliated with the Symbolic Systems Program. The faculty adviser may impose requirements beyond those described here.

Admission to the program as a coterminal student is subject to the policies and deadlines described in the "Undergraduate Degrees" section of this bulletin (see "Coterminal Bachelor's and Master's Degrees"). Applicants to the M.S. program are reviewed each quarter during the academic year. Information on exact deadlines and required procedures for applying are available from the Symbolic Systems Program's Student Services Coordinator in the Linguistics Department office (460-127E).

REQUIREMENTS

A candidate for the M.S. degree in Symbolic Systems must complete a program of 45 units. At least 36 of these must be graded units, passed with an average grade of 3.0 (B) or better, and any course taken to fulfill requirements A, B, or C below must be taken for a letter grade unless the

course is offered S/NC only. The 45 units may include no more than 21 units of courses from those listed below under Requirements A and B. Furthermore, none of the 45 units to be counted toward the M.S. degree may include units counted toward an undergraduate degree at Stanford or elsewhere. Course requirements are waived only if evidence is provided that similar or more advanced courses have been taken, either at Stanford or another institution. Courses that are waived rather than taken may not be counted toward the M.S. degree.

Each candidate for the M.S. degree must fulfill the following requirements:

REQUIREMENT A

Demonstrated competence in the core requirements for the B.S. degree in Symbolic Systems. Candidates who have gone through the Symbolic Systems undergraduate program will satisfy this requirement in the course of the B.S. degree in Symbolic Systems. Undergraduates in other majors at Stanford who are admitted as candidates for a coterminal Symbolic Systems M.S. degree must complete all of the Symbolic Systems undergraduate core requirements, with the exception of the advanced small seminar requirement.

REQUIREMENT B

1. Completion of two additional skill requirements:
   a) *Computer Programming:* CS 108, Object-Oriented Systems Design; *and*
   b) *Empirical Methods:* one of the following:
      COMM 206. Communication Research Methods
      LINGUIST 237/Computer Science 224N. Natural Language Processing
      PSYCH 110. Research Methods and Experimental Design
      PSYCH 252. Statistical Methods for Behavioral and Social Science (for 3 or more units)
      PSYCH 253. Statistical Theory, Models, and Methodology (for 3 units)
      STATS 161. Introduction to Statistical Methods II
      STATS 200. Introduction to Statistical Inference
      STATS 201. Statistical Methods
      a Statistics course numbered higher than 201
2. Completion of three quarters of the Symbolic Systems Program M.S. Seminar (SYMBSYS 291).

REQUIREMENT C

Completion of an approved specialization track. All tracks of the Symbolic Systems M.S. program require students to do a substantial project. The course requirements for each track are designed to prepare a student to undertake such a project. The nature of the project depends on the student's focus, but may include software development, user testing, or a combination of these. In all cases, a written thesis or paper describing the project is required. The project normally takes three quarters, and work on the project may account for up to 15 units of a student's program. Each track of the SSP M.S. program has its own core requirements, as well as unit requirements from a set of elective courses. The tracks, and their requirements, are given below.

The Human-Computer Interaction (HCI) Track—

The HCI Core:
CS 161. Design and Analysis of Algorithms;
CS 147. Introduction to HCI Design; *and*
CS 247A. HCI: Interaction Design Studio

For HCI electives, at least 12 additional units of HCI courses, chosen in consultation with the student's adviser. The following are examples of themes around which an elective program might be built: Animation, Business Systems, Computer-Aided Design, Computer Graphics, Data Interfaces, Decision Systems, Design for Disabilities, Design Principles, Dialog Systems, Digital Art, Digital Media, Education Technology, Game Design, History of Computers, Information Retrieval, Intelligent Interfaces, Interaction Design, Internet Design, Medical Informatics, Multimedia Design, Object-Oriented Design, Philosophy of Computation, Social Aspects of Computing, Usability Analysis, Virtual Reality, and Workplace Computing.

The Natural Language Technology (NLT) Track—For the NLT core, in addition to the courses below, students in the NLT track must complete LINGUIST 237/CS 224N, Natural Language Processing, which can be used as the empirical methods course for Requirement B above.

1) An in-depth theory of English grammar course, e.g. LINGUIST 221A, Foundations of English Grammar
2) A graduate-level semantics course (if not already taken as part of Requirement A), e.g., LINGUIST 232A, Lexical Semantics, or 230B, Semantics and Pragmatics
3) A two-course sequence in Computational Linguistics:
   LINGUIST 238. Introduction to Computational Linguistics, *and*
   LINGUIST 239A. Parsing and Generation

The NLT Electives (at least 8 units from the following list):

CS 145. Introduction to Databases
CS 147. Introduction to HCI Design
CS 161. Design and Analysis of Algorithms
CS 221. Artificial Intelligence: Principles and Techniques
CS 222. Knowledge Representation
CS 224M. Multi-Agent Systems
CS 228. Probabilistic Models in Artificial Intelligence
CS 229. Statistical Learning
CS 329. Topics in Artificial Intelligence
LINGUIST 205. Phonetics
LINGUIST 221B. Studies in Universal Grammar
LINGUIST 222A. Lexical Foundations of Syntax
LINGUIST 224A. Introduction to Formal Universal Grammar
LINGUIST 227A. Optimality Theory Syntax
LINGUIST 230B. Semantics and Pragmatics
LINGUIST 233X. Semantics Seminar
LINGUIST 234. Introduction to Discourse Analysis
LINGUIST 235. Mathematical Linguistics
LINGUIST 237D. NLP Reading Seminar
LINGUIST 239B. Computational Semantics
LINGUIST 239M. Machine Translation
PSYCH 132. Language Processing
PSYCH 205. Foundations of Cognition
PSYCH 214. Psycholinguistics
PSYCH 244. Learning and Inference in Humans and Machines
SYMBSYS 115. Spoken Language Understanding Systems

The Individually Designed Option—Students wishing to design their own M.S. curriculum in Symbolic Systems must present a project plan as part of their application. This plan must be endorsed by the student's adviser prior to admission to the Symbolic Systems M.S. program. The application must also specify at least 20 units of coursework that the student will take in support of the project.

Students are admitted under this option only if they present well-developed plans whose interdisciplinary character makes them inappropriate for any departmental master's program, but appropriate for Symbolic Systems.

COURSES

SYMBSYS 10. Symbolic Systems Forum—A weekly lecture series, featuring different speakers who report on research of general interest to Symbolic Systems students and faculty. Regular attendance required for credit. May be repeated.

1 unit, Aut, Win, Spr (Staff)

SYMBSYS 100. Introduction to Cognitive Science—(Same as LINGUIST 144, PHIL 190.) The history, foundations, and accomplishments of the cognitive sciences, including presentations by leading Stanford researchers in artificial intelligence, linguistics, philosophy, and psychology. Overview of the issues addressed in the Symbolic Systems major. GER:3b

4 units, Spr (Beaver, Greeno, Wasow)

SYMBSYS 144. Uncertainty and Value Elicitation—Theory and evidence concerning behavioral measures of belief and preference. Topics include measurement theory, normative and descriptive theories of subjective probability and utility, response mode and framing effects, confidence calibration, incentive compatibility, valuation techniques, and hedonics.

3 units, Spr (Davies)

SYMBSYS 145. Cognition in Interaction Design—Analysis of interactive systems from the standpoint of human cognition. Topics include skill acquisition, complex learning, reasoning, language, perception, methods in usability testing, special computational techniques such as intelligent and adaptive interfaces, and design for people with cognitive disabilities. Students conduct analyses of real world problems of their own choosing and one major redesign/analysis project of an important interactive system.

4 units, Win (Shrager)

SYMBSYS 149. Web Content: Search—Hands-on course to develop methods and metrics for evaluating content and comparing relevance of competing web search technologies. Build and promote a web site that presents student's research findings. Limited enrollment. Prerequisites: Evidence of prior HTML/web design experience or coursework such as CS 139I.

3 units (Skokowski)

SYMBSYS 150. Computers and Social Decisions—Issues in the design of systems for interactive and collective decision making. Topics such as theories of games and social choice; qualitative and quantitative procedures for making collective decisions; psychological effects of presentation and framing on expressions of preference; features of dialogue systems and online communities; the ideal speech situation and related notions; online voting; the digital divide; and privacy, security, and trust.

3 units, not given 2002-03

SYMBSYS 151. Digital Divide: Gender, Class, and Political Economy of High-Tech Globalization—Does Silicon Valley represent the leading edge of a revolution in social and cultural relations in the 21st century and the coming of an Information Age, or an extension of gendered, racial, and class divisions of the industrial era? Historical examination of the political, social, and cultural impacts of high-tech driven globalization in the post-WW II era.

4 units, Spr (Carlson)

SYMBSYS 202. The Rationality Debate—Evidence and perspectives on whether or not the human mind is generally rational. Normative frameworks for rationality such as probability and utility theory are contrasted with descriptive, experimental studies. Opposing views are represented through readings from disciplines including psychology, statistics, philosophy, and economics. Prerequisites: STATS 116 or 90, or familiarity with the basic theory of probability. Recommended: PSYCH 40. Limited enrollment.

2-3 units, not given 2002-03

SYMBSYS 204. Philosophy of Linguistics—(Same as PHIL 285, LINGUIST 204.) Philosophical issues raised by contemporary linguistic theory. Topics include Chomsky's internalism, the competence/performance distinction, explanation and methodology in linguistics.

2-4 units, Win (Wasow)

SYMBSYS 205. Systems: Theory, Science, and Metaphor—Systems science explores abstract properties of systems such as network connectivity, complexity, and emergence, with applications in natural, social, and artificial domains. How useful are these theories? Are their claims testable or generalizable? Do they change the way people think and talk? Topics announced during the previous quarter and on the course web site. Prerequisite: completion of at least one Symbolic Systems undergraduate core course in each of the following areas: philosophy, psychology or linguistics, and computer science. Limited enrollment.

3 units, Win (Davies)

SYMBSYS 206. Topics in the Philosophy of Neuroscience—(Same as PHIL 206S.) Can problems of mind be solved by understanding the brain, or by understanding computational models of the brain? The views of philosophers and neuroscientists who believe so, and the views of others who are skeptical of neurophilosophical approaches to the mind. Recent literature in philosophy and neuroscience whose topics include perception, memory, neurophenomenology, sensorimotor accounts of consciousness, computational models, and eliminativism. Prerequisites: PHIL 80, familiarity with philosophy, or neuroscience, or consent of instructor.

3 units, Aut (Skokowski)

RESEARCH

SYMBSYS 91. Junior Honors Seminar—Strongly recommended for seniors doing an honors project during the following year. Defining a topic, choosing an adviser, considering overall goals. Resources at Stanford and some experiences of seniors are discussed with guest speakers.

2 units, Win (Davies)

SYMBSYS 190. Senior Honors Tutorial—Under the supervision of their faculty honors adviser, students work on their senior honors project. Can be repeated for credit.

1-5 units, any quarter (Staff)

SYMBSYS 191. Senior Honors Seminar—Strongly recommended for seniors doing an honors project. Under the leadership of the Symbolic Systems program coordinator, students meet, discuss, and present their honors project.

2 units, Aut (Davies)

SYMBSYS 196. Independent Study—Independent work under the supervision of a faculty member. Can be repeated for credit.

1-15 units, any quarter (Staff)

SYMBSYS 290. Masters Degree Project

1-15 units, any quarter (Staff)

SYMBSYS 291. Master's Program Seminar—Enrollment limited to students in the Symbolic Systems M.S. degree program. Can be repeated for credit.

1 unit, Aut, Win, Spr (Staff)

INTERDEPARTMENTAL OFFERINGS

See the respective department listings for course descriptions and General Education Requirements (GER) information.

COMMUNICATION

COMM 121/221. Voice Interfaces

2-4 units, Aut (Byrne)

COMM 206. Communication Research Methods

4-5 units, Win (Staff)

COMPUTER SCIENCE

CS 103A. Discrete Mathematics for Computer Science

3 units, Aut, Win (Johnson)

CS 103B. Discrete Structures

3 units, Win, Spr (Sahami)

CS 103X. Discrete Structures (Accelerated)

3-4 units, Win (Cain)

CS 106A. Programming Methodology

3-5 units, Aut, Spr (Sahami), Win (Plummer)

CS 106B. Programming Abstractions

3-5 units, Win, Spr (Zelenski)

CS 106X. Programming Methodology and Abstractions (Accelerated)

3-5 units, Aut, Spr (Zelenski)

CS 107. Programming Paradigms

3-5 units, Aut, Spr (Cain)

CS 108. Object-Oriented Systems Design

3-4 units, Aut, Win (Parlante)

CS 121. Introduction to Artificial Intelligence
3 units, Win (Latombe)

CS 147. Introduction to Human-Computer Interaction Design
3-4 units, Aut (Borchers)

CS 154. Introduction to Automata and Complexity Theory
3-4 units, Win (Batzoglou), Spr (Motwani)

CS 161. Design and Analysis of Algorithms
3-4 units, Spr (Staff)

CS 221. Artificial Intelligence: Principles and Techniques
3-4 units, Aut (Ng)

CS 224N. Natural Language Processing
3-4 units, Spr (Manning)

CS 247A. Human-Computer Interaction: Interaction Design Studio
3-4 units, Win (Staff)

CS 276A. Text Information Retrieval, Mining, and Exploitation: Basic Concepts
3 units, Aut (Manning, Raghavan, Schuetze)

CS 276B. Text Information Retrieval, Mining, and Exploitation: Advanced Topics
3 units, Win (Manning, Raghavan, Schuetze)

CS 378. Phenomenological Foundations of Cognition, Language, and Computation
3-4 units (Winograd) not given 2002-03

ECONOMICS

ECON 102A. Introduction to Statistical Methods (Postcalculus) for Social Scientists
5 units, Aut (Pistaferri), Win (Tendall)

ECON 160. Game Theory and Economic Applications
5 units, Win (Tadelis)

EDUCATION

EDUC 493B. Topics in Quantitative Methods
3 units, Win (Olkin)

ELECTRICAL ENGINEERING

EE 178. Probabilistic Systems Analysis
3 units, Win (Gray)

LINGUISTICS

LINGUIST 120. Introduction to Syntax
4 units, Aut (Bender, Wasow)

LINGUIST 128/228. Real English: The Syntax of Language Use
4 units, Win (Bresnan, Zaenen)

LINGUIST 130A. Introduction to Linguistic Meaning
4 units, Win (Peters)

LINGUIST 130B. Introduction to Lexical Semantics
4 units (Staff) alternate years, given 2003-04

LINGUIST 138/238. Introduction To Computational Linguistics
4 units, Aut (Kay)

LINGUIST 139M/239M. Machine Translation
4 units, Win (Kay)

LINGUIST 140/240. Language Acquisition I
4 units, Aut (E. Clark)

LINGUIST 221A. Foundations of English Grammar
4 units, not given 2002-03

LINGUIST 230A. Introduction to Semantics and Pragmatics
4 units, Win (Beaver)

LINGUIST 230B. Semantics and Pragmatics
2-4 units, not given 2002-03

LINGUIST 237. Natural Language Processing
3-4 units, Spr (Manning)

LINGUIST 237D. Readings in Natural Language Processing
1 unit, Aut, Spr (Baldwin, Lemon, Widdows), Win (Peters)

LINGUIST 239A. Topics in Computational Linguistics: Parsing and Generation
1-4 units, Spr (Oepen, Flickinger)

LINGUIST 239E. Topics in Computational Linguistics: Grammar Engineering
1-4 units, Win (Flickinger, Oepen)

LINGUIST 239F. Finite State Methods in Natural Language Processing
3-4 units, Aut (Karttunen)

MATHEMATICS

MATH 151. Introduction to Probability Theory
3 units, Win (Lee)

MANAGEMENT SCIENCE AND ENGINEERING

MS&E 120. Probablistic Analysis
5 units, Aut (Chiu)

PHILOSOPHY

PHIL 80. Mind, Matter, and Meaning
5 units, Win (Lawlor)

PHIL 159. Basic Concepts in Mathematical Logic
4 units, Aut (Arana)

PHIL 160A. First-Order Logic
4 units, Win (Arana)

PHIL 160B. Computability and Logic
4 units, Spr (Arana)

PHIL 181. Philosophy of Language
4 units, Aut (Crimmins)

PHIL 184. Theory of Knowledge
4 units, Win (Arana)

PHIL 186. Philosophy of Mind
4 units (Hills) not given 2002-03

PHIL 187. Philosophy of Action
4 units, Win (Bratman)

PHIL 189. Philosophical Applications of Cognitive Science
4 units, Spr (Strevens)

PHIL 287. Philosophy of Action
4 units, Win (Bratman)

PSYCHOLOGY

PSYCH 7N. Language Acquisition
3 units, Win (A. Fernald)

PSYCH 10. Introduction to Statistical Methods: Precalculus
5 units, Aut (Walther), Win (Thomas), Spr (Switzer)

PSYCH 17Q. Understanding Spoken Language
4 units, Win (A. Fernald)

PSYCH 30. Introduction to Perception
3 units, Aut (Grill-Spector)

PSYCH 40. Introduction to Cognitive Psychology
4 units, Win (Tversky)

PSYCH 50. Introduction to Cognitive Neuroscience
4 units, Win (Gabrieli)

PSYCH 70. Introduction to Social Psychology
4 units, Win (Eberhardt, Monin)

PSYCH 102/252. Statistical Methods for Behavioral and Social Sciences
6 units, Aut (Monin, Thomas)

PSYCH 103/253. Statistical Theory, Models and Methodology
3 units (Thomas) alternate years, given 2003-04

PSYCH 110. Research Methods and Experimental Design
5 units (M. Lepper) not given 2002-03

PSYCH 131. Language and Thought
4 units, Aut (H. Clark)

PSYCH 141. Cognitive Development
3 units, Aut (Markman)

PSYCH 148/247. Development of Language Understanding
3 units (A. Fernald) not given 2002-03

STATISTICS

STATS 60/160. Introduction to Statistical Methods: Precalculus
5 units, Aut (Walther), Win (Thomas), Spr (Switzer)

STATS 116. Theory of Probability
3-5 units, Aut (Taylor), Spr (Donoho), Sum (Staff)

STATS 191. Introduction to Regression Analysis and Applied Statistics
3-4 units, Spr (Taylor)

STATS 200. Introduction to Statistical Inference
3 units, Win (Romano)

STATS 211. Topics in Quantitative Methods
3 units, Win (Olkin)