SYMSYS 100. Minds and Machines. 4 Units.
An overview of the interdisciplinary study of cognition, information, communication, and language, with an emphasis on foundational issues: What are minds? What is computation? What are rationality and intelligence? Can we predict human behavior? Can computers be truly intelligent? How do people and technology interact, and how might they do so in the future? Lectures focus on how the methods of philosophy, mathematics, empirical research, and computational modeling are used to study minds and machines. Undergraduates considering a major in symbolic systems should take this course as early as possible in their program of study.
Same as: LINGUIST 144, PHIL 99, PSYCH 35

SYMSYS 122. Artificial Intelligence: Philosophy, Ethics, & Impact. 3-4 Units.
Recent advances in computing may place us at the threshold of a unique turning point in human history. Soon we are likely to entrust management of our environment, economy, security, infrastructure, food production, healthcare, and to a large degree even our personal activities, to artificially intelligent computer systems. The prospect of “turning over the keys” to increasingly autonomous systems raises many complex and troubling questions. How will society respond as versatile robots and machine-learning systems displace an ever-expanding spectrum of blue- and white-collar workers? Will the benefits of this technological revolution be broadly distributed or accrue to a lucky few? How can we ensure that these systems respect our ethical principles when they make decisions at speeds and for rationales that exceed our ability to comprehend? What, if any, legal rights and responsibilities should we grant them? And should we regard them merely as sophisticated tools or as a newly emerging form of life? The goal of this course is to equip students with the intellectual tools, ethical foundation, and psychological framework to successfully navigate the coming age of intelligent machines.

SYMSYS 130. Research Methods in the Cognitive and Information Sciences. 3 Units.
Understanding the different methodological approaches used in disciplines that study cognition and information. Emphasis is on philosophical/analytical, formal/mathematical, empirical, and computational thinking styles, with some attention to other methods as well. What assumptions underlie these methods? How can they be combined? How do practitioners of each discipline think differently about problems, and what are the challenges involved in studying or working across them?.

SYMSYS 150. CRYPTOCURRENCIES SEMINAR. 2 Units.
A weekly seminar allowing students the opportunity to discuss and explore cryptocurrencies from a variety of domains and view points:n1) Explore the history of fiat currencies, both economically and philosophically. How does Bitcoin mesh in here? What are advantages and disadvantages compared to traditional fiat currencies? (~2 weeks)n2) Contextualize and juxtapose decentralized currencies with respect to TCP/IP, Napster, and other relevant decentralized and cloud protocols. (~2 weeks)n3) Work through and understand Satoshiqnest:s initial protocol and proof-of-work mining system. What problem did she solve? How? Why was it important? How can we prove it mathematically? What are significant game theoretic and cryptographic weaknesses? What do alternative cryptocurrencies look like? Is there a bestiquest; alternative? (~3 weeks)n4) What does iquest;Bitcoin as a protocolqnest; mean? What can be built on top of it? Whatiquest; being built around it? What does regulation look like? What are hypotheses for the future of digital currencies? How do we explain investor confidence, given regulatory hesitation? (~3 weeks).

SYMSYS 161. Applied Symbolic Systems in Venture Capital + Entrepreneurship. 2 Units.
A weekly seminar allowing students the opportunity to discuss and explore applied Symbolic Systems in technology, entrepreneurship, and venture capital. We will explore popular conventions and trends through the lens of numerous deductive and applied Symbolic Systems.
Same as: SYMSYS 261

SYMSYS 170. Decision Behavior: Theory and Evidence. 3-4 Units.
Introduction to the study of judgment and decision making, relating theory and evidence from disciplines such as psychology, economics, statistics, neuroscience, and philosophy. The development and critique of Homo economicus as a model of human behavior, and more recent theories based on empirical findings. Recommended: background in formal reasoning.
Same as: SYMSYS 270

SYMSYS 184. Syntactic Theory and Implementation. 4 Units.
Analysis and implementation of grammatical phenomena of English. Introduction to a theory of formal grammar, and its computational realization. Practical experience in forming linguistic hypotheses and testing them via implementation using state-of-the-art language technology.
Same as: LINGUIST 184

SYMSYS 190. Senior Honors Tutorial. 1-5 Unit.
Under the supervision of their faculty honors adviser, students work on their senior honors project. May be repeated for credit.

SYMSYS 191. Senior Honors Seminar. 1 Unit.
Recommended for seniors doing an honors project. Under the leadership of the Symbolic Systems program coordinator, students discuss, and present their honors project.

SYMSYS 196. Independent Study. 1-15 Unit.
Independent work under the supervision of a faculty member. Can be repeated for credit.

SYMSYS 200. Symbolic Systems in Practice. 2-3 Units.
Applying a Symbolic Systems education at Stanford and outside. The basics of research and practice. Students develop and present a project, and investigate different career paths, including academic, industrial, professional, and public service, through interviews with alumni.

SYMSYS 201. ICT, Society, and Democracy. 3 Units.
The impact of information and communication technologies on social and political life. Interdisciplinary. Classic and contemporary readings focusing on topics such as social networks, virtual versus face-to-face communication, the public sphere, voting technology, and collaborative production. Prerequisite: Completion of a course in psychology, communication, human-computer interaction, or a related discipline, or consent of the instructor.

SYMSYS 203. Cognitive Science Perspectives on Conflict, Violence, Peace, and Justice. 3 Units.
In recent years, cognitive scientists have turned more attention to questions that have traditionally been investigated by historians, political scientists, sociologists, and anthropologists, e.g. What are the sources of conflict and disagreement between people?, What drives or reduces violence and injustice?, and What brings about or is conducive to peace and justice? In this advanced small seminar, we will read and discuss works by psychologists, neuroscientists, philosophers, and others, which characterize this growing research area among those who study minds, brains, and behavior.nRequired: Completion of a course in psychology beyond the level of Psych 1, or consent of the instructor.

SYMSYS 204. Philosophy of Linguistics. 4 Units.
Philosophical issues raised by contemporary work in linguistics. Topics include: the subject matter of linguistics (especially internalism vs. externalism), methodology and data (especially the role of quantitative methods and the reliance on intuitions), the relationship between language and thought (varieties of Whorfianism and anti-Whorfianism), nativist arguments about language acquisition, and language evolution.
Same as: LINGUIST 204, PHIL 369

SYMSYS (SYMSYS)
SYMSYS 206. Philosophy of Neuroscience. 4 Units.
Can problems of mind be solved by understanding the brain, or models of the brain? The views of philosophers and neuroscientists who believe so, and others who are skeptical of neurophilosophical approaches to the mind. Historical and recent literature in philosophy and neuroscience. Topics may include perception, memory, neural accounts of consciousness, neurophenomenology, neuroscience and physics, computational models, and eliminativism. (Not open to freshmen.)
Same as: PHIL 167D, PHIL 267D

SYMSYS 209. Battles Over Bits. 3 Units.
The changing nature of information in the Internet age and its relationship to human behavior. Philosophical assumptions underlying practices such as open source software development, file sharing, common carriage, and community wireless networks, contrasted with arguments for protecting private and commercial interests such as software patents, copy protection, copyright infringement lawsuits, and regulatory barriers. Theory and evidence from disciplines including psychology, economics, computer science, law, and political science. Prerequisite: PSYCH 40, 55, 70, or SYMSYS 202.

SYMSYS 210. Learning Facial Emotions: Art and Psychology. 3 Units.
Artistic and psychological learning approaches for emotion recognition from facial expressions. The advantages of learning by image-based microexpressions, subtle expressions, macro expressions, art drawing and actor mimicry when there are cognitive deficits due to conditions such as autism. Comparative analysis uses brain studies, learning theory, and human-computer interaction. Studio component conveys the artistic and psychological approaches. Prerequisites: PSYCH 1, SYMSYS 100 or consent of instructor. Go to www.stanford.edu/~dwilkins/Symsys210Enroll.doc to sign up for a Permission Number.

SYMSYS 211. Learning Facial Emotions: Art, Psychology, Human-Computer Interaction. 3 Units.
Learning to recognize facial emotions by drawing a live model versus the psychology method of using classified images of subtle and micro expressions. Dimensions of analysis include cognitive modeling and neuroscience. The design of human-computer interaction systems for people with cognitive deficits such as autism and Aspergers, which integrate the art and psychology approaches using methods such as robot heads, avatars, and facial recognition software. Prerequisites: PSYCH 1 or consent of instructor.

SYMSYS 245. Cognition in Interaction Design. 3 Units.
Note: Same course as 145 which is no longer active. 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 redesign/analyze a project of an interactive system. Limited enrollment seminar taught in two sections of approximately ten students each. Admission to the course is by application to the instructor, with preference given to Symbolic Systems students of advanced standing. Recommended: a course in cognitive psychology or cognitive anthropology.

SYMSYS 255. Building Digital History: Social Movements and Protest at Stanford. 3-5 Units.
A project-based course focused on developing a collaborative history website based on oral and archival history research. Thematic focus is the history of student activism at Stanford. How have political activities such as demonstrations, assemblies, educational events, and nonviolent civil disobedience been organized on campus, and how have they affected Stanford? What lessons can be drawn from the past for students interested in social change? Students will choose historical periods and/or specific social movements for research. Course will feature guest appearances by representatives from a range of social movements at Stanford the past fifty years, and the building of an online repository and community for the collaborative representation and discussion of history.

SYMSYS 255A. Building Digital History: Social Movements and Protest at Stanford. 1 Unit.
Lectures-only version of Symsys 255.

SYMSYS 261. Applied Symbolic Systems in Venture Capital + Entrepreneurship. 2 Units.
A weekly seminar allowing students the opportunity to discuss and explore applied Symbolic Systems in technology, entrepreneurship, and venture capital. We will explore popular conventions and trends through the lens of numerous deductive and applied Symbolic Systems.
Same as: SYMSYS 161

SYMSYS 270. Decision Behavior: Theory and Evidence. 3-4 Units.
Introduction to the study of judgment and decision making, relating theory and evidence from disciplines such as psychology, economics, statistics, neuroscience, and philosophy. The development and critique of Homo economicus as a model of human behavior, and more recent theories based on empirical findings. Recommended: background in formal reasoning.
Same as: SYMSYS 170

SYMSYS 280. Symbolic Systems Research Seminar. 1 Unit.
A mixture of public lectures of interest to Symbolic Systems students (the Symbolic Systems Forum) and student-led meetings to discuss research in Symbolic Systems. Can be repeated for credit. Open to both undergraduates and Master’s students.

SYMSYS 290. Master’s Degree Project. 1-15 Unit.

SYMSYS 291. Master’s Program Seminar. 1 Unit.
Enrollment limited to students in the Symbolic Systems M.S. degree program. May be repeated for credit.

SYMSYS 296. Independent Study. 1-15 Unit.
Independent work under the supervision of a faculty member. Can be repeated for credit.

Optional for students selected as Undergraduate Advising Fellows in the Symbolic Systems Program. AFs work with program administrators to assist undergraduates in the Symbolic Systems major or minor, in course selection, degree planning, and relating the curriculum to a career or life plan, through advising and events. Meeting with all AFs for an hour once per week under the direction of the Associate Director. Requires a short reflective paper at the end of the quarter on what the AF has learned about advising students in the program. Repeatable for credit. May not be taken by students who receive monetary compensation for their work as an AF.

SYMSYS 299. Curricular Practical Training. 1 Unit.
Students obtain employment in a relevant research or industrial activity to enhance their professional experience consistent with their degree programs. Meets the requirements for curricular practical training for students on F-1 visas. Students submit a concise report detailing work activities, problems worked on, and key results. May be repeated for credit. Prerequisite: qualified offer of employment and consent of advisor.