

COGNITIVE SCIENCE

Department Website: <https://voices.uchicago.edu/cognitivescience> (<https://voices.uchicago.edu/cognitivescience/>)
PROGRAM OF STUDY

Cognitive science explores the nature of cognitive processes such as perception, reasoning, memory, attention, language, decision making, emotion, motor control, and problem solving. The goal of cognitive science, stated simply, is to understand how minds work, in humans, animals, and machines. Cognitive science emerged in the latter part of the 20th century at the intersection of computer science, linguistics, neuroscience, philosophy, and psychology, and is an inherently interdisciplinary endeavor, drawing on tools and ideas from the social sciences, the physical and biological sciences, and the humanities. Topics of research include (but are not limited to) cognitive development, cognitive processing, judgment and decision making, language and communication, the neurological bases of cognition, perception, and memory, philosophy of mind, and artificial intelligence. A defining feature of cognitive science is its emphasis on integration among fields, for a truly interdisciplinary study of the mind. Students will be trained in formal methods of analysis and modeling that are common in majors in the physical and biological sciences, but often absent from majors in the humanities and social sciences; at the same time, students will also be trained in the advanced reasoning skills that define humanistic inquiry, but are often absent from more technical or applied majors.

The undergraduate major in Cognitive Science at the University of Chicago is designed to embody this interdisciplinary approach to the study of the mind and brain. Students gain broad knowledge of the field by taking courses in each of the five main disciplinary areas—computer science, linguistics, philosophy, psychology, and neuroscience—and then develop further focus and depth of understanding by taking additional courses in two of these disciplinary areas. Students will form key technical foundations through a Formal Foundations requirement, and will gain critical training in integrating interdisciplinary perspectives through the two core foundational courses: COGS 20001 Mind, Brain and Meaning and COGS 20002 Cognitive Models. A distinguishing feature of the Cognitive Science major at the University of Chicago is the centrality of the humanistic component of the study of the mind: starting immediately with the foundational course sequence, questions about what it *means* to learn, communicate, and think will be assigned equal significance to, and asked alongside, questions about what it *is* to learn, communicate, and think. Training emphasizes both engagement with the principal theories of mind and the evidence that bears on choices between them, and development of the conceptual and practical skills needed for understanding and conducting theoretical and empirical work in the field.

Students who are majoring in Cognitive Science may visit the Department of Cognitive Science homepage at voices.uchicago.edu/cognitivescience (<https://voices.uchicago.edu/cognitivescience/>) to learn about events and resources on and off campus and for links to information on employment opportunities.

PROGRAM REQUIREMENTS

Students who complete a major in Cognitive Science will receive the degree of bachelor of arts. To qualify for the BA, students must minimally satisfy the general education requirements and take an additional 15 required courses for the major, which fall into four categories:

1. **Introductory Courses**, which engage students with the core questions, intellectual history, and analytical methods that unify cognitive scientific research. The two required Introductory Courses are COGS 20001 Mind, Brain and Meaning and COGS 20002 Cognitive Models. (200 units)
2. **Formal Foundations Courses**, which give students the analytical tools to explore different strands of contemporary cognitive scientific research. (200 units)
3. **Disciplinary Courses**, which provide breadth and depth in the five core disciplines (computer science, linguistics, neuroscience, philosophy, and psychology). Students are required to take one approved course in each of the five core disciplines and two additional courses in two of the core disciplines. (900 units)
 - **Breadth courses** provide breadth in the core disciplines of cognitive science and insights into their methods, practices, and theories. (500 units)
 - **Depth courses** provide additional depth into a core discipline through exposure to more specific topics within that core discipline. (400 units)
4. **Extra-Disciplinary Courses**, which engage students with cognitive scientific work in areas beyond the core disciplines, including anthropology, economics, music, political science, and religion, to expose students to the full breadth of the interdisciplinary study of the mind. (200 units)

Note that some courses may be used to satisfy different requirements; but no single course may be “double counted” towards satisfaction of two requirements. For example, a student who takes PHIL 20100 Introduction to Logic may count it either towards satisfaction of the Formal Foundations requirement or towards satisfaction of the Philosophy Core Discipline requirement, but not both.

INTRODUCTORY COURSES

There are two introductory courses in the Cognitive Science major, COGS 20001 Mind, Brain and Meaning and COGS 20002 Cognitive Models, which serve two purposes. First, they introduce students to the empirical

questions, theoretical concepts, and analytical methodologies that led to the emergence of cognitive science as a distinct field of study and continue to drive contemporary research. Second, they will highlight the ways that these issues manifest in the core disciplines of cognitive science—computer science, linguistics, neuroscience, philosophy, and psychology—and the ways that progress on central questions about the nature of the mind have been informed by interactions, conversations, and collaborations across the disciplines. Ideally, both courses will normally be co-taught by faculty from different fields, with the dual goal of providing substantive disciplinary expertise in more than one area, and of manifesting, in the classroom, the kind of interdisciplinarity that defines the field.

FORMAL FOUNDATIONS COURSES

The Cognitive Science major requires students to develop expertise in the formal analytical methods used in the field. The specific formal skills that will be most useful to individual students depend on their particular areas of interest, so students are free to select any two courses from an approved set of options from a range of courses in mathematics, computer science, statistics, and logic. Though not formally required, experience with the equivalent of one course in calculus is highly recommended, as expertise in this area is required for many of the Core Discipline courses. (NOTE: Calculus I-II may be used to satisfy the Formal Foundations requirement only if the courses are not used to satisfy the general education requirement in the mathematical sciences.)

The following list provides examples of courses that could be used to satisfy the Formal Foundations requirement, but it is meant to be illustrative only and is not exhaustive. Students may petition for approval of a course not on this list as satisfaction of the Formal Foundations requirement by submitting a proposal and rationale to the Director of the Cognitive Science Program.

Cognitive Science Formal Foundations Courses

BIOS 20236	Biological Dynamics	100
CHDV 39301	Qualitative Research Methods	100
CMSC 12100	Computer Science with Applications I	100
CMSC 12200	Computer Science with Applications II	100
CMSC 14100	Introduction to Computer Science I	100
CMSC 14200	Introduction to Computer Science II	100
CMSC 14300	Systems Programming I	100
CMSC 14400	Systems Programming II	100
CMSC 15100	Introduction to Computer Science I	100
CMSC 15200	Introduction to Computer Science II	100
CMSC 15400	Introduction to Computer Systems	100
CMSC 25300	Mathematical Foundations of Machine Learning	100
CMSC 27100	Discrete Mathematics	100
LING 21020	Formal Foundations of Linguistics	100
LING 22500	Quantitative Research Methods in Linguistics	100
LING 36601	Intro to Python and R for Linguists	100
MATH 13100	Elem Functions and Calculus I (or higher)	100
MATH 13200	Elem Functions and Calculus II (or higher)	100
MATH 19620	Linear Algebra	100
MATH 20250	Abstract Linear Algebra	100
MATH 27700	Mathematical Logic I	100
MATH 28000	Introduction to Formal Languages	100
NSCI 21820	Introduction to Python for Biologists & Neuroscientists	100
PHIL 20100	Introduction to Logic	100
PSYC 20200	Psychological Research Methods	100
PSYC 20250	Introduction to Statistical Concepts and Methods	100
STAT 23400	Statistical Models and Methods	100
STAT 24400	Statistical Theory and Methods I	100
STAT 24500	Statistical Theory and Methods II	100
STAT 27410	Introduction to Bayesian Data Analysis	100

CORE DISCIPLINE COURSES

The core disciplines of cognitive science are computer science, linguistics, neuroscience, philosophy, and psychology. The Core Discipline requirements are designed to strike a balance between breadth and depth in the

core disciplines, while also allowing students a great deal of freedom to construct an individualized plan of study that best matches their interests in cognitive science. Students in the Cognitive Science major must take:

- **Five Core Discipline breadth courses:** one approved course in each of the five core disciplines. Breadth courses provide breadth in the core disciplines of cognitive science and insights into their methods, practices, and theories.
- **Four Core Discipline depth courses:** two additional courses in two of the core disciplines. Depth courses provide additional depth into a core discipline through exposure to more specific topics within that core discipline.

Approved electives from each of the five core disciplines are listed below; students may, in addition, request approval of a course that is not on this list by submitting a proposal and rationale to the Program Coordinator.

Cognitive Science Core Discipline Courses: Computer Science

BIOS 20172	Mathematical Modeling for Pre-Med Students	100
CMSC 14100	Introduction to Computer Science I	100
CMSC 14200	Introduction to Computer Science II	100
CMSC 14300	Systems Programming I	100
CMSC 14400	Systems Programming II	100
CMSC 15100	Introduction to Computer Science I	100
CMSC 15200	Introduction to Computer Science II	100
CMSC 15400	Introduction to Computer Systems	100
CMSC 20600	Introduction to Robotics	100
CMSC 20630	Human-Robot Interaction: Research and Practice	100
CMSC 21800	Data Science for Computer Scientists	100
CMSC 23900	Data Visualization	100
CMSC 25300	Mathematical Foundations of Machine Learning	100
CMSC 25400	Machine Learning	100
CMSC 25500	Introduction to Neural Networks	100
CMSC 25700	Natural Language Processing	100
CMSC 27200	Theory of Algorithms	100
COGS 20100	Perspectives on large language models: computational, cognitive, social	100
DATA 22100	Introduction to Machine Learning: Concepts and Applications	100

Cognitive Science Core Discipline Courses: Linguistics

COGS 20100	Perspectives on large language models: computational, cognitive, social	100
COGS 24001	Prediction in Language Comprehension	100
LING 11100	Biological and Cultural Evolution	100
LING 20101	Introduction to Phonetics and Phonology	100
LING 20150	Language and Communication	100
LING 20201	Introduction to Syntax	100
LING 20301	Introduction to Semantics and Pragmatics	100
LING 21000	Morphology	100
LING 21020	Formal Foundations of Linguistics	100
LING 21720	Sociophonetics	100
LING 21920	The Evolution of Language	100
LING 22460	Seminar: Phonology	100
LING 23501	New Perspectives on Language Emergence	100
LING 23701	Crosslinguistic Perspectives on Language Development	100
LING 23920	The Language of Deception and Humor	100
LING 24400	Lexical Functional Grammar	100
LING 26810	Bilingualism and Heritage Languages	100
LING 27010	Psycholinguistics	100
LING 28610	Undergraduate Computational Linguistics	100
LING 28620	Computational Linguistics	100
LING 29404	Multilingualism and Multilingual Education	100

LING 30201	Syntactic Analysis I	100
LING 30202	Syntactic Analysis - II	100
LING 30302	Semantics and Pragmatics II	100

Cognitive Science Core Discipline Courses: Neuroscience

NSCI 20101	Foundations of Neuroscience	100
NSCI 20130	Systems Neuroscience	100
NSCI 20510	Evolution and the Nervous System	100
NSCI 21015	Biological Psychology	100
NSCI 21625	Cognitive Neuroscience in Humans and Rodents	100
NSCI 21750	Ethics through a Neurobiological Lens	100
NSCI 21811	Building the Brain	100
NSCI 22010	Neuroscience of Consciousness	100
NSCI 22015	Cognitive Psychology	100
NSCI 22535	The Psychology and Neurobiology of Stress	100
NSCI 23700	Methods in Computational Neuroscience	100
NSCI 23810	Neurons and Glia: A Cellular and Molecular Perspective	100

Cognitive Science Core Discipline Courses: Philosophy

PHIL 20012	Accelerated Introduction to Logic	100
PHIL 20100	Introduction to Logic	100
PHIL 21218	Being and Goodness: Varieties of Constitutivism	100
PHIL 21506	Memory and Unity of a Person	100
PHIL 21726	The Mind/Body Problem	100
PHIL 21730	Aristotle's Metaphysics	100
PHIL 22000	Introduction to the Philosophy of Science	100
PHIL 22202	Modern Social Contract Theory	100
PHIL 22277	The Philosophy of Thomas Kuhn	100
PHIL 22960	Introduction to Bayesian Epistemology	100
PHIL 23000	Introduction to Metaphysics and Epistemology	100
PHIL 23022	Agency and Virtual Reality: A Technophilosophical Exploration	100
PHIL 23027	Philosophy of Animal Minds	100
PHIL 23401	Philosophy and Science Fiction	100
PHIL 23405	History and Philosophy of Biology	100
PHIL 23501	Philosophy of Mind	100
PHIL 23502	Introduction to the Philosophy of Mind	100
PHIL 23540	Other Minds	100
PHIL 24010	Meaning and Reference	100
PHIL 25000	History of Philosophy I: Ancient Philosophy	100
PHIL 26000	History of Philosophy II: Medieval and Early Modern Philosophy	100
PHIL 26701	Descartes	100
PHIL 28010	Introduction to Philosophy of Language	100
PHIL 29408	Intuitionistic Logic	100

Cognitive Science Core Discipline Courses: Psychology

COGS 24001	Prediction in Language Comprehension	100
PSYC 20300	Biological Psychology	100
PSYC 20400	Cognitive Psychology	100
PSYC 20500	Developmental Psychology	100
PSYC 20700	Sensation and Perception	100
PSYC 20850	Introduction to Human Development	100
PSYC 21100	Human Development Research Design	100
PSYC 21109	Concepts and Categories	100
PSYC 21510	Neuroscience of Communication	100

PSYC 21750	Biological Clocks and Behavior	100
PSYC 22950	Emergence and Development of Mathematics and Language	100
PSYC 23120	Human Language and Interaction	100
PSYC 23200	Introduction to Language Acquisition	100
PSYC 23660	The Disordered Mind	100
PSYC 23720	Crosslinguistic Perspectives on Language Development	100
PSYC 23820	Attention and Working Memory in the Mind and Brain	100
PSYC 24010	Systems Neuroscience	100
PSYC 25101	The Psychology of Decision Making	100
PSYC 25500	Cognitive and Social Neuroscience of Aging	100
PSYC 25620	How Children Think	100
PSYC 25700	The Psychology of Negotiation	100
PSYC 26010	Big Data in the Psychological Sciences	100
PSYC 26780	Emotion and Motivation	100
PSYC 27010	Psycholinguistics	100
PSYC 28962	Principles and Methods of Measurement	100
PSYC 28990	Constructing consciousness: How do we go from matter to mind?	100
PSYC 29120	Human Communication	100
PSYC 31900	The Neuroscience of Narratives	100

EXTRA-DISCIPLINARY COURSES

The Extra-Disciplinary requirement ensures that students also engage with cognitive scientific work outside the core disciplines, in areas such as music, anthropology, religion, economics, and political science, and so are exposed to the full breadth of the interdisciplinary study of the mind. Students in the major must take a total of two Extra-Disciplinary courses.

A partial list of courses that could be used to satisfy the Extra-Disciplinary requirement is provided below; as above, students may also request approval of courses not included in this list, or courses from other fields, by submitting a proposal and rationale to the Director of the Cognitive Science Program.

Cognitive Science Extra-Disciplinary Courses

ANTH 21355	Remembering: An Anthropological Approach	100
ANTH 24321	Psychological Anthropology	100
ASTR 23000	Cosmos and Conscience: Looking for Ourselves Elsewhere	100
BPRO 28400	Thinking Psychoanalytically: From the Sciences to the Arts	100
BUSN 20710	Behavioral Economics	100
CHDV 20703	Literacy, Language, and Education	100
CHDV 22580	Child Development in the Classroom	100
CHDV 23100	Human Language and Interaction	100
CHDV 27950	Evolution and Economics of Human Behavior	100
ENGL 12720	Inventing Consciousness: Literature, Philosophy, Psychology	100
MUSI 20719	Music and Mind	100
MUSI 43720	Music and Affect	100
PLSC 24210	Politicizing the Passions: Emotions and Collective Action	100
RLST 23750	The End of Metaphysics and the Future of Philosophy	100
RLST 24240	Buddhism and Science: A Critical Introduction	100

SUMMARY OF REQUIREMENTS FOR THE BA IN COGNITIVE SCIENCE

COGS 20001 Mind, Brain and Meaning	100
COGS 20002 Cognitive Models	100
Two Formal Foundations Courses	200
Five Core Discipline breadth courses	500
Four Core Discipline depth courses	400
Two Extra-Disciplinary courses	200
Total Units	1500

MINOR IN COGNITIVE SCIENCE

The minor in Cognitive Science consists of six courses (600 units) across the first three categories of the major:

Two Introductory Courses:	200
COGS 20001 Mind, Brain and Meaning	
COGS 20002 Cognitive Models	
One Formal Foundations Course**	100
Three Disciplinary Courses from three of the five core disciplines	300
<hr/> Total Units	<hr/> 600

** Students who have taken a course for another program of study that could be counted as a Formal Foundations Course may replace the Formal Foundations requirement with a fourth elective from the set of Disciplinary or Extra-Disciplinary Courses.

PROCESS OF DECLARING THE MAJOR OR MINOR

College students from any field of study may complete a major or minor in Cognitive Science. Students are encouraged to construct individual programs and should regularly consult with the Program Coordinator and/or the Program Director, as well as their College adviser, about their pathway through the program.

Students should confer with their College adviser, as well as the Cognitive Science Program Coordinator (via the appropriate form (<https://voices.uchicago.edu/cognitivescience/advising/>)), before declaring a major or minor in Cognitive Science.

GRADING

All courses used to satisfy requirements for the major must be taken for quality grades. With consent of the instructor, nonmajors may take COGS courses for P/F grading.

HONORS

Students wishing to receive a BA in Cognitive Science with honors must carry out an independent research project that culminates in an honors thesis. To be eligible for consideration of honors status, students must:

- submit a research proposal (no more than three pages) by the end of the fifth week of the third quarter before the student graduates (canonically Autumn Quarter of the fourth year)
- submit the Honors Thesis Advisor Agreement Form (<https://voices.uchicago.edu/cognitivescience/files/2023/11/Honors-Thesis-Advisor-Agreement-Form.pdf>), with signatures from the student and advisor(s)
- have an overall GPA of 3.25 or above by the time of proposal submission
- have a GPA of 3.5 or above in courses counting towards the Cognitive Science major by the time of proposal submission

Research proposals should explain the project and its significance, and document the student's preparation for the work. Proposals should be approved by the student's thesis advisor(s), and students are required to submit completed Honors Thesis Advisor Agreement Forms as part of their honors applications. Students are strongly encouraged to identify co-advisors from distinct disciplines.

The thesis must be submitted by the fifth week of the quarter in which the student plans to graduate (typically Spring Quarter of the student's fourth year). Theses should be emailed as PDFs to the Program Coordinator, Prof. Melinh Lai (melinh@uchicago.edu), and to the faculty Program Director, Prof. Chris Kennedy (ck@uchicago.edu).

This program may accept an honors thesis or project used to satisfy the same requirement in another major with the consent of both program directors. Students should consult with the relevant program directors by the earliest BA proposal deadline, or by the end of their third year if neither program publishes a deadline. The Petition to Use a Single Bachelor's Paper for Two Majors (https://humanities-web.s3.us-east-2.amazonaws.com/college-prod/s3fs-public/documents/BA_Double_Major_0.pdf) form, to be signed by both program directors, must be completed and returned to the College adviser by the end of Autumn Quarter of the student's year of graduation.

COGNITIVE SCIENCE COURSES

COGS 20001. Mind, Brain and Meaning. 100 Units.

What is the relationship between physical processes in the brain and body and the processes of thought and consciousness that constitute our mental life? Philosophers and others have puzzled over this question for millennia. Many have concluded it to be intractable. In recent decades, the field of cognitive science--encompassing philosophy, psychology, neuroscience, computer science, linguistics, and other disciplines--has proposed a new form of answer. The driving idea is that the interaction of the mental and the physical may be understood via a third level of analysis: that of the computational. This course offers a critical introduction

to the elements of this approach, and surveys some of the alternative models and theories that fall within it. Readings are drawn from a range of historical and contemporary sources in philosophy, psychology, linguistics, and computer science. (B) (II)

Instructor(s): Jason Bridges; Leslie Kay; Chris Kennedy Terms Offered: Autumn

Equivalent Course(s): PHIL 26520, NSCI 22520, LING 36520, PSYC 36520, PSYC 26520, LING 26520, SIGN 26520, PHIL 36520

COGS 20002. Cognitive Models. 100 Units.

A foundational principle of cognitive science is that the workings of cognitive systems—whether biological, mechanical, or digital—can be productively represented by the operation of formal computational models. This course provides a survey of popular modeling frameworks (such as Bayesian rational agents, connectionist networks, dynamical systems, etc.), as well as the cognitive phenomena that these models have been used to simulate. We will discuss the theoretical commitments of these models, assess strengths and weaknesses of each framework for addressing different types of cognitive questions, and analyze the implications of these models' successes and failures for our understanding of the mind.

Instructor(s): Yu Ji, Eugene Terms Offered: Spring

Equivalent Course(s): LING 20002, LING 30002

COGS 20100. Perspectives on large language models: computational, cognitive, social. 100 Units.

In this interdisciplinary course, students will delve into the multifaceted world of large language models (LLMs), investigating their computational, cognitive, and social dimensions. The course covers an array of topics, such as the history and evolution of LLMs, computational underpinnings like neural networks and training methodologies, cognitive aspects of human-like language understanding, communication, and creativity, as well as crucial ethical and social considerations, encompassing fairness, transparency, trustworthiness, and privacy. Through both lectures and discussions, we will examine the scientific and practical applications and limitations of LLMs across diverse domains and contemplate the future prospects and challenges LLMs pose for science, technology, and society. Through critical discourse, hands-on exercises, and case studies, our goal is to foster a comprehensive understanding of LLMs, empowering students to critically assess these models and contribute to ongoing dialogues regarding their broader implications. Prior experience in computer science or cognitive science is beneficial but not mandatory. Note: this course primarily focuses on cultivating reflective thinking about LLMs, rather than programming or implementation. Students with programming skills are, however, encouraged to utilize them to facilitate their learning.

Instructor(s): Eugene Yu Ji Terms Offered: Autumn

Equivalent Course(s): LING 20110

COGS 22000. Introduction to Linguistics. 100 Units.

This course offers a brief survey of how linguists analyze the structure and the use of language. Looking at the structure of language means understanding what phonemes, words, and sentences are, and how each language establishes principles for the combinations of these things and for their use; looking at the use of language means understanding the ways in which individuals and groups use language to declare their social identities and the ways in which languages can change over time. The overarching theme is understanding what varieties of language structure and use are found across the world's languages and cultures, and what limitations on this variety exist.

Instructor(s): 2022-2023: Erik Zyman (Autumn), Jacob Phillips (Winter), Laura Stigliano (Spring) 2023-2024:

Lenore Grenoble (Autumn), Staff (Winter and Spring) Terms Offered: Autumn Spring Winter

Equivalent Course(s): LING 20001

COGS 22001. Introduction to Phonetics and Phonology. 100 Units.

This course is an introduction to the study of speech sounds and their patterning in the world's languages. The first half of the course focuses on how speech sounds are described with respect to their articulatory, acoustic, and perceptual structures. There are lab exercises both in phonetic transcription and in the acoustic analysis of speech sounds. The second half focuses on fundamental notions that have always been central to phonological analysis and that transcend differences between theoretical approaches: contrast, neutralization, natural classes, distinctive features, and basic phonological processes (e.g., assimilation).

Instructor(s): 2022-2023: Jason Riggle (Spring) 2023-2024: Jason Riggle (Autumn) Terms Offered: Spring

Prerequisite(s): LING 20001

Equivalent Course(s): LING 20101

COGS 22002. Language and Communication. 100 Units.

This course can also be taken by students who are not majoring in Linguistics but are interested in learning something about the uniqueness of human language, spoken or signed. It covers a selection from the following topics: What is the position of spoken language in the usually multimodal forms of communication among humans? In what ways does spoken language differ from signed language? What features make spoken and signed language linguistic? What features distinguish linguistic means of communication from animal communication? How do humans communicate with animals? From an evolutionary point of view, how can we account for the fact that spoken language is the dominant mode of communication in all human communities around the world? Why cannot animals really communicate linguistically? What do the terms language "acquisition" and "transmission" really mean? What factors account for differences between "language acquisition" by children and by adults? Are children really perfect language learners? What factors bring

about language evolution, including language speciation and the emergence of new language varieties? How did language evolve in mankind? This is a general education course without any prerequisites. It provides a necessary foundation to those working on language at the graduate and undergraduate levels.

Instructor(s): Salikoko Mufwene Terms Offered: Autumn

Equivalent Course(s): LING 30150, CHDV 30150, CHDV 20150, EDSO 20150, LING 20150

COGS 22003. Introduction to Syntax. 100 Units.

This course is an introduction to basic goals and methods of current syntactic theory through a detailed analysis of a range of phenomena, with emphasis on argumentation and empirical justification. Major topics include phrase structure and constituency, selection and subcategorization, argument structure, case, voice, expletives, and raising and control structures.

Instructor(s): 2023-2023: Amy Dahlstrom Terms Offered: Winter

Prerequisite(s): LING 20001

Equivalent Course(s): LING 20201

COGS 22004. Introduction to Semantics and Pragmatics. 100 Units.

This course familiarizes students with what it means to study meaning and use in natural language. By "meaning" we refer to the (for the most part, logical) content of words, constituents, and sentences (semantics), and by "use" we intend to capture how this content is implemented in discourse and what kinds of additional dimensions of meaning may then arise (pragmatics). Some of the core empirical phenomena that have to do with meaning are introduced: lexical (i.e., word) meaning, reference, quantification, logical inferencing, presupposition, implicature, context sensitivity, cross-linguistic variation, speech acts. Main course goals are not only to familiarize students with the basic topics in semantics and pragmatics but also to help them develop basic skills in semantic analysis and argumentation.

Instructor(s): Anastasia Giannakidou Terms Offered: Spring

Prerequisite(s): LING 20001

Equivalent Course(s): LING 30310, LING 20301

COGS 22005. Morphology. 100 Units.

Why is the plural of child in English children and not *childs? Why is undoable ambiguous ((i) 'unable to be done', (ii) 'able to be undone'), while unkillable isn't (only 'unable to be killed')? Unhappier is intuitively composed of several, smaller pieces: un-, happy, and -er; but what about unkempt? These questions are the purview of MORPHOLOGY, the field of linguistics devoted to studying the internal structure of words and how they are formed. Consequently, in this course we will investigate the nature of morphemes, in all their cross-linguistic shapes and guises. Key concepts which will frame our discussion include inflection, syncretism, allomorphy, and blocking. The only prerequisite for this course is LING 20001: Introduction to Linguistics.

Instructor(s): Amy Dahlstrom Terms Offered: Winter

Prerequisite(s): LING 20001

Equivalent Course(s): LING 21000

COGS 22006. Sociophonetics. 100 Units.

Variation is a ubiquitous feature of speech, yet much of the variation observed is non-random. This class will examine this type of structured heterogeneity (Weinreich et al., 1968) from the point of view of sociophonetics. We will focus on the interrelationships between phonetic/phonological form and social factors such as speaking style and the background of the speaker, with a particular interest in explaining the origins and transmission of linguistic change. Our goals will be to (a) acquire the phonetic and phonological foundation necessary to conduct sociophonetic research through practical exercises; (b) survey new sociolinguistic research that addresses issues in phonetic and phonological theories and (c) locate and explain phonetic variation in its social context while drawing on current approaches to the relationship between language and society.

Instructor(s): Alan Yu Terms Offered: Winter

Equivalent Course(s): LING 31720, LING 21720, CHST 21720

COGS 22007. The Evolution of Language. 100 Units.

This course is designed to review critically some of the literature on the phylogenetic emergence of Language, in order to determine which questions have been central to the subject matter, which ones have recurred the most, and to what extent the answers to these are now better informed. The class will also review new questions such as the following: What is the probable time of the emergence of modern language(s)? Should we speak of the emergence of Language or of languages, in the plural?

Instructor(s): Salikoko Mufwene Terms Offered: Winter

Equivalent Course(s): LING 21920, EVOL 41920, PSYC 41920, LING 41920, ANTH 47305, CHDV 21920, CHDV 41920, CHSS 41920

COGS 22010. The Language of Deception and Humor. 100 Units.

In this course we will examine the language of deception and humor from a variety of perspectives: historical, developmental, neurological, and cross-cultural and in a variety of contexts: fiction, advertising, politics, courtship, and everyday conversation. We will focus on the (linguistic) knowledge and skills that underlie the use of humor and deception and on what sorts of things they are used to communicate.

Instructor(s): Jason Riggie Terms Offered: Winter

Equivalent Course(s): LING 23920, SIGN 26030, LING 33920

COGS 22011. Bilingualism and Heritage Languages. 100 Units.

TBD.

Instructor(s): Anastasia Giannakidou, Zoe Gavriilidou Terms Offered: Autumn

Equivalent Course(s): LING 36810, LING 26810

COGS 22013. Psycholinguistics. 100 Units.

This is a survey course in the psychology of language. We will focus on issues related to language comprehension, language production, and language acquisition. The course will also train students on how to read primary literature and conduct original research studies.

Instructor(s): Ming Xiang (Autumn), Monica Do (Spring) Terms Offered: Autumn Spring

Equivalent Course(s): LING 27010, PSYC 27010

COGS 22014. Lexical Semantics. 100 Units.

You can nail a postcard to the wall with a dart but you can't microwave it with anything other than a microwave. This seems not to be a fact about nails and microwaves, but rather about English verbs that are derived from nouns. Is it a random fact, or does it correlate systematically with other facts about verbs derived from nouns that a linguistic theory should account for? This class is an introduction to basic concepts and issues in the study of word meaning within theoretical linguistics. It explores grammatical regularities in word meaning, what kinds of information can be grammatically encoded by words, how the meaning of a word can determine the word's syntactic distribution, and how it relates to the inferences people draw from the utterances in which a word occurs. The course will demonstrate that addressing questions of lexical meaning draws on the full resources of linguistic theory and methodology.

Instructor(s): Francez, Itamar Terms Offered: Autumn

Prerequisite(s): LING 20301 - Introduction to Semantics and Pragmatics

Equivalent Course(s): LING 27131

COGS 22015. Computational Linguistics. 100 Units.

This course is a mixed level introduction to topics at the intersection of computation and language. We will study computational linguistics from both scientific and engineering angles: the use of computational modeling to address scientific questions in linguistics and cognitive science, as well as the design of computational systems to solve engineering problems in natural language processing (NLP). The course will combine analysis and discussion of these approaches with training in the programming and mathematical foundations necessary to put these methods into practice. The course is designed to accommodate students both with and without prior programming experience. Our goal is for all students to leave the course able to engage with and critically evaluate research in cognitive/linguistic modeling and NLP, and to be able to implement intermediate-level computational models for novel computational linguistics research.

Instructor(s): Allyson Ettinger Terms Offered: Autumn

Equivalent Course(s): LING 38620, CMSC 35620, LING 28620

COGS 24001. Prediction in Language Comprehension. 100 Units.

Language tends to follow predictable patterns, from what sounds and words are about to be uttered, to what grammatical structures are likely, to be used to what broader implications are about to be suggested, and more. One prevailing hypothesis is that the human mind can take advantage of this predictability to help maintain the rapid pace of language comprehension. This course will explore critical questions surrounding the nature of prediction processes during language comprehension. What do people predict? How are their predictions constrained? How can we study the inherently internal process(es) of prediction? What are the consequences of prediction? Perhaps most importantly, what do the answers to these questions suggest about the mechanisms and computations of prediction? Readings will primarily consist of contemporary articles from peer-reviewed journals, and class meetings will be a mix of lectures and student-led discussions.

Instructor(s): Melinh Lai Terms Offered: Spring

Equivalent Course(s): LING 24001, PSYC 24090

COGS 25000. Artificial Intelligence, Human Condition, Human Capacities. 100 Units.

This seminar course will engage students from multiple disciplines in critically reflecting upon the current advancements in artificial intelligence with their implications for the human condition and human capabilities. The first group of readings will incorporate classical works by thinkers such as Hanna Arendt, Norbert Wiener, and Karl Jaspers on the human condition, and Amartya Sen and Martha Nussbaum's works on human capacities. The second group of readings will include contemporary research papers from computer science, cognitive science, linguistics, anthropology, economics, and philosophy. Students will be asked to develop their own perspective and methodology to engage with and relate the two groups of readings, further develop their literature on the topic, and write a final research paper on the human condition in the age of AI.

Instructor(s): Eugene Yu Ji Terms Offered: Spring

Equivalent Course(s): KNOW 35002, FNDL 25004, MAPS 35000, MAPH 35000, KNOW 25002, COGS 35000

COGS 25001. Foundations of Neurolinguistics. 100 Units.

This course will explore the cognitive and neural bases underlying language comprehension and production. Class topics will draw on historic and contemporary research invoking a range of neuroimaging techniques to examine how sound, meaning, and structure are processed in the brain. Students will also explore how theories about the computations and representations underlying human language can inform, and be informed by, the

biological constraints imposed by the nervous system. Prior knowledge of neuroscience is not required, but familiarity with linguistic and psychological concepts may be beneficial.

Instructor(s): Lai, Melinh Terms Offered: Autumn

Equivalent Course(s): LING 25001, NSCI 23125, PSYC 25010

COGS 29001. Contemporary Topics in Cognitive Science. 100 Units.

This course will survey multiple areas of modern research currently being conducted across the subfields of cognitive science. Each week we will discuss a new topic of contemporary cognitive science research and participate in a lecture from a researcher in that field. Students should expect to complete weekly readings of scholarly articles and other primary literature, which we will then further contextualize with the other topics in the course and the broader visions of modern cognitive science research.

Instructor(s): Melinh Lai Terms Offered: Winter

Prerequisite(s): COGS 20001 and COGS 20002

Note(s): Priority registration will be given to third-year students who are majoring in cognitive science.

COGS 29002. Cognitive Science Honors Seminar. 100 Units.

This course will be an overview of the reading, writing, and other practical skills involved in completing a research project. Students will read and discuss articles on academic research and writing and will provide feedback on the presentations and written works of their peers.

Instructor(s): Melinh Lai Terms Offered: Winter

Prerequisite(s): COGS 20001 and COGS 20002

Note(s): Open to fourth-year students in the cognitive science major who are conducting an honors thesis project.

