

Cognitive Science

Bachelor of Arts (BA)

Cognitive Science is the cross-disciplinary study of the structure and processes of human cognition and their computational simulation or modeling. This interdisciplinary program is designed to give students an understanding of questions dealing with human cognition, such as concept formation, visual perception, the acquisition and processing of natural language, and human reasoning and problem solving.

The program draws on relevant courses found within the fields of anthropology, biology, computer science, education, linguistics, philosophy, and psychology, as well as specially designed lower and upper division courses in cognitive science.

Declaring the Major

For prerequisites required before declaring the major, please see the Major Requirements tab. Students interested in the major should consult the Cognitive Science website (<http://cogsci.berkeley.edu>) and then schedule an appointment with the student academic adviser (<http://cogsci.berkeley.edu/contact-information>). The Cognitive Science office is located in 140 Stephens Hall.

Honors Program

Cognitive Science majors who wish to graduate with honors must have an overall GPA of 3.30 or higher in all work completed at the University and a 3.30 GPA or higher in the major program at the time of graduation. In addition, they must complete a thesis of high quality, based upon independent study with a member of the Cognitive Science faculty and marked by satisfactory completion of at least three units in any of the following courses: COG SCI H195A, COG SCI H195B, or COG SCI 199.

Please visit the Cognitive Science Honors webpage for more information (<http://cogsci.berkeley.edu/honors>).

In addition to the University, campus, and college requirements listed on the College Requirements tab, students must fulfill the following requirements specific to their major program.

General Guidelines

1. All courses taken to fulfill major requirements must be taken for a letter grade.
2. A lower division requirement may be repeated one time only with the repeated grade being final. For all other groups, students may repeat courses one time only with the repeated grade being final.
3. All students must complete at least 26 upper division units.
4. A minimum grade point average (GPA) of 2.0 must be maintained in all courses used by the major and for upper division courses used by the major.
5. No more than two upper division courses may be used to simultaneously fulfill requirements in a double major. No more than one upper division course may be used to simultaneously fulfill requirements for a student's minor program, with the exception of minors offered outside of the College of Letters & Science.
6. Please note that COG SCI 197, COG SCI 199, COG SCI H195A, and COG SCI H195B may not be used to fulfill upper division requirements.

For information regarding all requirements outside the major, including breadth requirements, residence requirements and unit requirements, please see the College Requirements tab.

Students admitted to Berkeley Spring 2015 and earlier should review requirements in the Berkeley Academic Guide archive (<http://guide.berkeley.edu/archive/2018-19/archive>).

Summary of Major Requirements

Lower division prerequisites: two courses	10-12
Additional lower division requirements: three courses	7
Upper division distribution requirements: six courses	18-24
Upper division electives: three courses	9-12
Total Units	44-55

Lower Division Prerequisites

MATH 1A	Calculus (preferred)	3-4
or MATH 16A	Analytic Geometry and Calculus	
COMPSCI/STAT C8	Foundations of Data Science	4
COMPSCI 61A	The Structure and Interpretation of Computer Programs	4
or ENGIN 7	Introduction to Computer Programming for Scientists and Engineers	

Lower Division Requirements

COG SCI 1	Introduction to Cognitive Science	4
MCELLBI C61	Brain, Mind, and Behavior	3
or MCELLBI C64	Exploring the Brain: Introduction to Neuroscience	
MATH 55	Discrete Mathematics	4
or COMPSCI 70	Discrete Mathematics and Probability Theory	

Upper Division Distribution Requirements

Select one course from each of the following six areas. Courses that are listed within more than one area of concentration can be counted toward only one requirement.

Cognitive Neuroscience

ANTHRO 107	Evolution of the Human Brain	4
COG SCI/ PSYCH C127	Cognitive Neuroscience	3
PSYCH 117	Human Neuropsychology	3
PSYCH 133	Psychology of Sleep	3
PSYCH 114	Biology of Learning	3

Cognitive Psychology

COG SCI C100/ PSYCH C120	Basic Issues in Cognition	3
COG SCI C102/ PSYCH C129	Scientific Approaches to Consciousness	3
COG SCI/ PSYCH C126	Perception	3
LINGUIS C146/ PSYCH C143	Language Acquisition	3
PSYCH 122	Introduction to Human Learning and Memory	3
PSYCH 164	Social Cognition	3

PSYCH 140	Developmental Psychology	3
PSYCH 147	Methods in Cognitive Development	3
Computational Modeling		
COG SCI 131	Computational Models of Cognition	4
COMPSCI 188	Introduction to Artificial Intelligence	4
Linguistics		
COG SCI C101/ LINGUIS C105	Cognitive Linguistics	4
COG SCI/ LINGUIS C142	Language and Thought	3
COG SCI/ LINGUIS C147	Course Not Available	
LINGUIS 100	Introduction to Linguistic Science	4
LINGUIS 108	Psycholinguistics	3
Philosophy		
PHILOS 3	The Nature of Mind	4
PHILOS 12A	Introduction to Logic	4
PHILOS 25A	Ancient Philosophy	4
PHILOS 25B	Modern Philosophy	4
CLASSIC 36	Greek Philosophy	4
PHILOS 122	Theory of Knowledge	4
PHILOS 132	Philosophy of Mind	4
PHILOS 133	Philosophy of Language	4
PHILOS 135	Theory of Meaning	4
PHILOS 136	Philosophy of Perception	4
Society, Culture, and Cognition		
ANTHRO 166	Language, Culture, and Society	4
INFO 103	History of Information	3
COG SCI/ LINGUIS C104	Course Not Available	
ECON 119	Psychology and Economics	4
EDUC 140AC/ W140/W140A	The Art of Making Meaning: Educational Perspectives on Literacy and Learning in a Global World	4
LINGUIS 150	Sociolinguistics	3
PSYCH 107	Buddhist Psychology	3
PSYCH 160	Social Psychology	3
PSYCH 164	Social Cognition	3
PSYCH 166AC	Cultural Psychology	3
SOCIOL 150	Social Psychology	4

Upper Division Electives

In addition to completing the six distribution groups, students must complete at least three additional elective courses. Please see a Cognitive Science adviser if you have a question about focusing your electives on a particular area.

Select three courses from the following list:

ANTHRO 149	Psychological Anthropology	4
ANTHRO 160AC	Forms of Folklore	4
ANTHRO 161	Narrative Folklore	4
COG SCI C140/ LINGUIS C160	Quantitative Methods in Linguistics	4
COMPSCI 160	User Interface Design and Development	4

COMPSCI 170	Efficient Algorithms and Intractable Problems	4
COMPSCI 186	Introduction to Database Systems	4
COMPSCI/VIS SCI C280	Computer Vision	3
COMPSCI 287	Advanced Robotics	3
COMPSCI 288	Natural Language Processing	4
EDUC 224A	Mathematical Thinking and Problem Solving	3
EDUC C229A/ PSYCH C223	Proseminar: Problem Solving and Understanding	3
LINGUIS 106	Metaphor	4
LINGUIS 110	Phonetics	4
LINGUIS 115	Morphology	4
LINGUIS 120	Syntax	4
LINGUIS 121	Formal Semantics	4
LINGUIS 123	Pragmatics	3
LINGUIS 125	Gesture, Cognition, and Culture	3
LINGUIS 130	Comparative and Historical Linguistics	4
LINGUIS/SLAVIC C139	Language Spread	3
LINGUIS 151	Language and Gender	3
LINGUIS 158	Computational Methods	3
LINGUIS 170	History, Structure, and Sociolinguistics of a Particular Language	3
LINGUIS 181	Lexical Semantics	3
MCELLBI 160	Cellular and Molecular Neurobiology	4
MCELLBI 160L	Neurobiology Laboratory	4
MCELLBI 161	Circuit, Systems and Behavioral Neuroscience	4
MCELLBI 165	Neurobiology of Disease	3
MCELLBI 166	Biophysical Neurobiology	3
MEDIAST 101	Visual Culture	4
MEDIAST 102	Course Not Available	4
MUSIC 108/108M	Music Perception and Cognition	4
MUSIC 109/109M	Music Cognition: The Mind Behind the Musical Ear	3
NATAMST 151	Native American Philosophy	4
PHILOS 128	Philosophy of Science	4
PHILOS 138	Philosophy of Society	4
PHILOS 140A	Intermediate Logic	4
PHILOS 140B	Intermediate Logic	4
PHILOS 176	Hume	4
PHILOS 178	Kant	4
PHILOS 185	Heidegger	4
PHILOS 186B	Later Wittgenstein	4
PHILOS 188	Phenomenology	4
POL SCI 161	Public Opinion, Voting and Participation	4
POL SCI 164A	Political Psychology and Involvement	4
PSYCH 110	Introduction to Biological Psychology	3
PSYCH 114	Biology of Learning	3
PSYCH 121	Animal Cognition	3
PSYCH 125	The Developing Brain	3
PSYCH 167AC	Stigma and Prejudice	3

RHETOR 103A	Approaches and Paradigms in the History of Rhetorical Theory	4
RHETOR 103B	Approaches and Paradigms in the History of Rhetorical Theory II	4
RHETOR 110	Advanced Argumentative Writing	4
RHETOR 170	Rhetoric of Social Science	4
VIS SCI 265	Neural Computation	3

Undergraduate students must fulfill the following requirements in addition to those required by their major program.

For detailed lists of courses that fulfill college requirements, please review the College of Letters & Sciences (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science>) page in this Guide. For College advising appointments, please visit the L&S Advising (<https://ls.berkeley.edu/advising/about-undergraduate-advising-services>) Pages.

University of California Requirements

Entry Level Writing (<http://writing.berkeley.edu/node/78>)

All students who will enter the University of California as freshmen must demonstrate their command of the English language by fulfilling the Entry Level Writing requirement. Fulfillment of this requirement is also a prerequisite to enrollment in all reading and composition courses at UC Berkeley.

American History and American Institutions (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science/american-history-institutions-requirement>)

The American History and Institutions requirements are based on the principle that a US resident graduated from an American university, should have an understanding of the history and governmental institutions of the United States.

Berkeley Campus Requirement

American Cultures (<http://americancultures.berkeley.edu/students/courses>)

All undergraduate students at Cal need to take and pass this course in order to graduate. The requirement offers an exciting intellectual environment centered on the study of race, ethnicity and culture of the United States. AC courses offer students opportunities to be part of research-led, highly accomplished teaching environments, grappling with the complexity of American Culture.

College of Letters & Science Essential Skills Requirements

Quantitative Reasoning (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science/quantitative-reasoning-requirement>)

The Quantitative Reasoning requirement is designed to ensure that students graduate with basic understanding and competency in math, statistics, or computer science. The requirement may be satisfied by exam or by taking an approved course.

Foreign Language (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science/foreign-language-requirement>)

The Foreign Language requirement may be satisfied by demonstrating proficiency in reading comprehension, writing, and conversation in a

foreign language equivalent to the second semester college level, either by passing an exam or by completing approved course work.

Reading and Composition (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science/reading-composition-requirement>)

In order to provide a solid foundation in reading, writing, and critical thinking the College requires two semesters of lower division work in composition in sequence. Students must complete parts A & B reading and composition courses by the end of their second semester and a second-level course by the end of their fourth semester.

College of Letters & Science 7 Course Breadth Requirements

Breadth Requirements (<http://guide.berkeley.edu/archive/2018-19/undergraduate/colleges-schools/letters-science/#breadthrequirements>)

The undergraduate breadth requirements provide Berkeley students with a rich and varied educational experience outside of their major program. As the foundation of a liberal arts education, breadth courses give students a view into the intellectual life of the University while introducing them to a multitude of perspectives and approaches to research and scholarship. Engaging students in new disciplines and with peers from other majors, the breadth experience strengthens interdisciplinary connections and context that prepares Berkeley graduates to understand and solve the complex issues of their day.

Unit Requirements

- 120 total units
- Of the 120 units, 36 must be upper division units
- Of the 36 upper division units, 6 must be taken in courses offered outside your major department

Residence Requirements

For units to be considered in "residence," you must be registered in courses on the Berkeley campus as a student in the College of Letters & Science. Most students automatically fulfill the residence requirement by attending classes here for four years. In general, there is no need to be concerned about this requirement, unless you go abroad for a semester or year or want to take courses at another institution or through UC Extension during your senior year. In these cases, you should make an appointment to meet an adviser to determine how you can meet the Senior Residence Requirement.

Note: Courses taken through UC Extension do not count toward residence.

Senior Residence Requirement

After you become a senior (with 90 semester units earned toward your BA degree), you must complete at least 24 of the remaining 30 units in residence in at least two semesters. To count as residence, a semester must consist of at least 6 passed units. Inter-campus Visitor, EAP, and UC Berkeley-Washington Program (UCDC) units are excluded.

You may use a Berkeley Summer Session to satisfy one semester of the Senior Residence requirement, provided that you successfully complete 6 units of course work in the Summer Session and that you have been enrolled previously in the college.

Modified Senior Residence Requirement

Participants in the UC Education Abroad Program (EAP), Berkeley Summer Abroad, or the UC Berkeley Washington Program (UCDC) may meet a Modified Senior Residence requirement by completing 24 (excluding EAP) of their final 60 semester units in residence. At least 12 of these 24 units must be completed after you have completed 90 units.

Upper Division Residence Requirement

You must complete in residence a minimum of 18 units of upper division courses (excluding UCEAP units), 12 of which must satisfy the requirements for your major.

Mission

Cognitive Science is an interdisciplinary field of inquiry that is concerned with the acquisition, representation, and use of knowledge by individual minds, brains, and machines, as well as groups, institutions, and other social entities. Because the fundamental purpose of the University, as a social institution, is the preservation, generation, and transmission of knowledge, cognitive science speaks to the heart of the University's mission. By engaging faculty from psychology, philosophy, linguistics, computer science, neuroscience, and anthropology, sociology, and other social sciences in common purpose, cognitive science constitutes a microcosm of the University as a whole. Berkeley's Cognitive Science Program is almost unique in terms of the scope of our approach to the field.

Cognitive Science major students are expected to approach problems of knowledge using the tools of several different disciplines: philosophy, psychology, linguistics, computer science, neuroscience, and various social sciences. This expectation is reflected in a demanding curriculum that moves from a broad introductory survey course (COG SCI 1), to a six-course distribution requirement covering the philosophy of mind, cognitive psychology, linguistics, computational modeling and artificial intelligence, neuroscience, and various social sciences. After fulfilling their distribution requirement, students have the opportunity to concentrate further study in one of these six fields, and to complete an honors thesis.

Learning Goals for the Major

By the end of their undergraduate careers, cognitive science majors are expected to understand and critically evaluate:

1. Research and theory in cognitive psychology, including perception, attention, learning, memory, reasoning, problem-solving, judgment, and decision-making.
2. Research and theory in linguistics, with special attention to the relation between language and thought.
3. Various approaches to artificial intelligence, and the computational modeling of cognitive processes.
4. The biological bases of cognitive functions, as uncovered by cognitive neuroscience.
5. Classic and contemporary work on the philosophy of mind, including the mind-body problem, mental causation, freedom of the will, and the nature of consciousness.
6. The sociocultural context of individual cognition, including the social construction and organization of knowledge, cultural differences in cognition, the history of information, etc.

Skills

We also expect that students will have acquired the following skills for lifelong learning and effective citizenship:

1. Formulating a well-organized argument supported by evidence.
2. Effectively written, spoken, and graphical communication.
3. Problem-solving in cognitive science and its constituent fields.
4. Applying critical thinking skills in new and complex situations.
5. Using probability and statistics in reasoning.
6. Understanding the social implications of theory and research in cognitive science for responsible professional, civic, and ethical behavior.

Graduate Study

Cognitive Science does not have a graduate program at UC, Berkeley. The cognitive science research community at Berkeley is centered around the Institute of Cognitive and Brain Sciences (<http://icbs.berkeley.edu>). Students interested in cognitive science graduate study can receive graduate training in programs in affiliated disciplines, e.g., psychology (<http://psychology.berkeley.edu>), linguistics (<http://linguistics.berkeley.edu>), neuroscience (<http://neuroscience.berkeley.edu>). There is presently no separate graduate program specifically for cognitive science. We are exploring the possibility of starting a cognitive science graduate program in the near future.

Honors

Students with a 3.3 grade point average overall and in the upper division major courses may apply for admission to the honors program in their senior year. The awarding of honors is contingent upon submission of a thesis of high quality, based upon independent study with a member of the Cognitive Science faculty and marked by satisfactory completion of at least 3 and at most 6 units of course H195A, H195B or 199. Evaluation of the thesis is the responsibility of, first, the faculty supervisor and then of the second reader, both secured by the student. It is the responsibility of the supervisor and the second reader to decide (1) whether the thesis is of honors quality and (2) if of honors quality, which level of honors is to be assigned: Honors, High Honors, or Highest Honors. Please see the Cognitive Science program's Honors page for additional details. (<http://cogsci.berkeley.edu/honors>)

Student Association

The Cognitive Science Student Association (CSSA) is a great resource for students interested in Cognitive Science. About the CSSA, from their website: *The CSSA regularly coordinates academic events such as guest lectures and information sessions; plans social events like professor-student dinners and cog sci themed gatherings; and works with cognitive science faculty and university officials to provide assistance for students. Additionally, the CSSA teaches its own decal on research methodology, has an academic outreach program, and organizes the annual California Cognitive Science Conference.* Click here to visit the CSSA website. (<http://cssa.berkeley.edu>)

Cognitive Science

Expand all course descriptions [+] Collapse all course descriptions [-]

COG SCI 1 Introduction to Cognitive Science 4 Units

Terms offered: Spring 2020, Fall 2019, Spring 2019

This course introduces the interdisciplinary field of cognitive science. Lectures and readings will survey research from artificial intelligence, psychology, linguistics, philosophy, and neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and consciousness. Sections will demonstrate some of the major methodologies.

Introduction to Cognitive Science: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for Cognitive Science 1 after completing Cognitive Science N1 or Cognitive Science C1/Education C1. A deficient grade in Cognitive Science C1/Education C1 or Cognitive Science N1 may be removed by taking Cognitive Science 1.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to Cognitive Science: Read Less [-]

COG SCI 1B Introduction to Cognitive Science 3 Units

Terms offered: Fall 2019, Fall 2017, Fall 2016

This course introduces the interdisciplinary field of cognitive science. Lectures and readings will survey research in such fields as artificial intelligence, psychology, linguistics, philosophy, and neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and consciousness.

Introduction to Cognitive Science: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for N1 after taking Cognitive Science 1 or Cognitive Science C1/Education C1.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Introduction to Cognitive Science: Read Less [-]

COG SCI N1 Introduction to Cognitive Science 3 Units

Terms offered: Summer 2020 First 6 Week Session, Summer 2019 First 6 Week Session, Summer 2019 Second 6 Week Session

This course introduces the interdisciplinary field of cognitive science. Lectures and readings will survey research in such fields as artificial intelligence, psychology, linguistics, philosophy, and neuroscience, and will cover topics such as the nature of knowledge, thinking, remembering, vision, imagery, language, and consciousness. Sections will demonstrate some of the major methodologies. This course is a core prerequisite for the Cognitive Science major and therefore must be taken for a letter grade.

Introduction to Cognitive Science: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for N1 after taking Cognitive Science 1 or Cognitive Science C1/Education C1.

Hours & Format

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Formerly known as: C1

Introduction to Cognitive Science: Read Less [-]

COG SCI 88 Data Science and the Mind 2 Units

Terms offered: Spring 2019, Spring 2018, Spring 2017

How does the human mind work? We explore this question by analyzing a range of data concerning such topics as human rationality and irrationality, human memory, how objects and events are represented in the mind, and the relation of language and cognition. This class provides students with critical thinking and computing skills that will allow them to work with data in cognitive science and related disciplines.

Data Science and the Mind: Read More [+]

Rules & Requirements

Prerequisites: This course is meant to be taken concurrently with Computer Science C8/Statistics C8/Information C8. Students may take more than one 88 (data science connector) course if they wish, ideally concurrent with or after having taken the C8 course

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of laboratory, 0.5 hours of discussion, and 0.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Data Science and the Mind: Read Less [-]

COG SCI 98 Directed Group Study 1 - 4 Units

Terms offered: Spring 2016, Spring 2015, Fall 2014

Seminar for the group study of selected topics. Topics may be initiated by students subject to the approval of the major advisor.

Directed Group Study: Read More [+]

Rules & Requirements

Credit Restrictions: Enrollment is restricted; see the Introduction to Courses and Curricula section of this catalog.

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Directed Group Study: Read Less [-]

COG SCI 99 Supervised Independent Study and Research 1 - 4 Units

Terms offered: Spring 2011, Fall 2010

Independent study and research by arrangement with faculty.

Supervised Independent Study and Research: Read More [+]

Rules & Requirements

Prerequisites: Restricted to freshmen and sophomores; consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 3-12 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Supervised Independent Study and Research: Read Less [-]

COG SCI C100 Basic Issues in Cognition 3 Units

Terms offered: Fall 2019, Fall 2016, Fall 2015

Theoretical foundations and current controversies in cognitive science will be discussed. Basic issues in cognition--including perception, imagery, memory, categorization, thinking, judgment, and development--will be considered from the perspectives of philosophy, psychology, computer science, and physiology. Particular emphasis will be placed on the nature, implications, and limitations of the computational model of mind.

Basic Issues in Cognition: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for Psychology C120 after passing PSYCH N120. A deficient grade in PSYCH N120 may be removed by taking PSYCH C120.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer:

6 weeks - 5 hours of lecture and 2.5 hours of discussion per week

8 weeks - 3.5 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: PSYCH C120

Basic Issues in Cognition: Read Less [-]

COG SCI N100 Basic Issues in Cognition 3 Units

Terms offered: Summer 2019 Second 6 Week Session, Summer 2018

Second 6 Week Session, Summer 2017 Second 6 Week Session

Theoretical foundations and current controversies in cognitive science will be discussed. Basic issues in cognition--including perception, imagery, memory, categorization, thinking, judgment, and development--will be considered from the perspectives of philosophy, psychology, computer science, and physiology. Particular emphasis will be placed on the nature, implications, and limitations of the computational model of mind.

Basic Issues in Cognition: Read More [+]

Rules & Requirements

Credit Restrictions: Students will receive no credit for Psychology N120 after passing PSYCH C120. A deficient grade in PSYCH C120 may be removed by taking PSYCH N120.

Hours & Format

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: PSYCH N120

Basic Issues in Cognition: Read Less [-]

COG SCI C101 Cognitive Linguistics 4 Units

Terms offered: Summer 2020 8 Week Session, Summer 2019 8 Week Session, Spring 2019, Summer 2017 8 Week Session

Conceptual systems and language from the perspective of cognitive science. How language gives insight into conceptual structure, reasoning, category-formation, metaphorical understanding, and the framing of experience. Cognitive versus formal linguistics. Implications from and for philosophy, anthropology, literature, artificial intelligence, and politics.

Cognitive Linguistics: Read More [\[+\]](#)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 6 hours of lecture and 1.5 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructors: G. Lakoff, E. Sweetser

Formerly known as: 105

Also listed as: LINGUIS C105

Cognitive Linguistics: Read Less [\[-\]](#)

COG SCI C102 Scientific Approaches to Consciousness 3 Units

Terms offered: Fall 2014, Spring 2013, Spring 2011

This course will examine the nature of human consciousness from the interdisciplinary perspective of cognitive science. It will cover topics from the philosophy of mind, cognitive linguistics, neuroscience, psychology, and computational models.

Recommended Courses: Psych C120/CogSci C100 OR Psych/CogSci C127

Scientific Approaches to Consciousness: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Required courses: Psych 1, Psych W1, Psych 2, OR CogSci 1

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: PSYCH C129

Scientific Approaches to Consciousness: Read Less [\[-\]](#)

COG SCI C126 Perception 3 Units

Terms offered: Spring 2020, Spring 2019, Spring 2018

An introduction to principal theoretical constructs and experimental procedures in visual and auditory perception. Topics will include psychophysics; perception of color, space, shape, and motion; pattern recognition and perceptual attention.

Perception: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Consent of instructor. 101 recommended

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: PSYCH C126

Perception: Read Less [\[-\]](#)

COG SCI C127 Cognitive Neuroscience 3 Units

Terms offered: Fall 2019, Fall 2018, Fall 2017

This course will examine research investigating the neurological basis of cognition. Material covered will include the study of brain-injured patients, neurophysiological research in animals, and the study of normal cognitive processes in humans with non-invasive behavioral and physiological techniques such as functional Magnetic Resonance Imaging (fMRI), electroencephalography (EEG), and transcranial magnetic stimulation (TMS). Topics to be covered include perception, attention, memory, language, motor control, executive control, and emotion.

Cognitive Neuroscience: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Psych/MCB C61 OR Psych 110, or Psych C120/Cog Sci C100, and relevant prerequisites. Courses may be taken simultaneously with Psych C127. Enrollment limited to students who are declared Psych, CogSci, MCB, or IB majors, or by permission of the instructor if the student has declared another major

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: PSYCH C127

Cognitive Neuroscience: Read Less [\[-\]](#)

COG SCI 131 Computational Models of Cognition 4 Units

Terms offered: Spring 2020, Summer 2019 8 Week Session, Spring 2019

This course will provide advanced students in cognitive science and computer science with the skills to develop computational models of human cognition, giving insight into how people solve challenging computational problems, as well as how to bring computers closer to human performance. The course will explore three ways in which researchers have attempted to formalize cognition -- symbolic approaches, neural networks, and probability and statistics -- considering the strengths and weaknesses of each.

Computational Models of Cognition: Read More [+]

Rules & Requirements

Prerequisites: Calculus, discrete mathematics, Cognitive Science 1, Computer Science 61A, or equivalents

Credit Restrictions: Student will receive no credit for Cognitive Science 131 after taking Cognitive Science C131/Psychology C123. A deficient grade in Cognitive C131/Psychology C123 may be removed by taking Cognitive Science 131.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 6 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Computational Models of Cognition: Read Less [-]

COG SCI C131 Computational Models of Cognition 4 Units

Terms offered: Spring 2013, Fall 2011, Fall 2010

This course will provide advanced students in cognitive science and computer science with the skills to develop computational models of human cognition, giving insight into how people solve challenging computational problems, as well as how to bring computers closer to human performance. The course will explore three ways in which researchers have attempted to formalize cognition -- symbolic approaches, neural networks, and probability and statistics -- considering the strengths and weaknesses of each.

Computational Models of Cognition: Read More [+]

Rules & Requirements

Prerequisites: Calculus, discrete mathematics, CogSci 1/1b/N1, Computer Science 61A, or equivalents

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Also listed as: PSYCH C123

Computational Models of Cognition: Read Less [-]

COG SCI C140 Quantitative Methods in Linguistics 4 Units

Terms offered: Spring 2020, Spring 2017, Spring 2016

An introduction to research using quantitative analysis in linguistics and cognitive science. Students will learn how to use the R programming environment for statistical analysis and data visualization.

Quantitative Methods in Linguistics: Read More [+]

Rules & Requirements

Prerequisites: 100 or graduate student standing

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Gahl

Also listed as: LINGUIS C160

Quantitative Methods in Linguistics: Read Less [-]

COG SCI C142 Language and Thought 3 Units

Terms offered: Spring 2020, Spring 2017, Summer 2016

This seminar explores the relation of language and thought. Is language uniquely human, and if so, what does this reveal about the human mind? Does the particular language you speak affect the way you think, or do human languages reflect a universal conceptual repertoire? The goal of this class is to familiarize you with a set of classic arguments on these themes, together with current research that evaluates these arguments, through weekly reading and discussion.

Language and Thought: Read More [+]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of seminar per week

Summer: 6 weeks - 7.5 hours of seminar per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Regier

Also listed as: LINGUIS C142

Language and Thought: Read Less [-]

COG SCI 144 Cognitive Science of Language 3 Units

Terms offered: Spring 2020

This class will explore language and the psychological and neurological processing related to language, language use, and cognition from the multidisciplinary perspective of cognitive science. This psycho-neuro-linguist approach will ask whether language is a unique system within the overall cognitive system, with its own specialized representations and operations, or whether language is more continuous with other cognition. Cognitive Science of Language: Read More [+]

Objectives Outcomes

Course Objectives: The objective of this course is to excite interest in and explore language and cognition through the lens of cognitive science. The psychological and neurological processing related to language helps to show the nature of the human mind in comparison to others, the unique variety of cognition that language serves, and the relation of that type of cognition to other types. This not only helps to reveal various forms of cognition but also how those forms relate in human, as well as non-human, minds. To do this we will ask:

- 1) What is language as a system and behavior of humankind?
- 2) Where is the knowledge of language from?
- 3) How is language acquired, processed, and lost in the human brain?
- 4) What do the empirical results and the history of linguistic studies that we cover reveal about how we think about language and, by implication, human beings themselves.

Rules & Requirements

Prerequisites: Cognitive Science 1/1B/N1 preferred

Hours & Format

Fall and/or spring: 15 weeks - 3-4 hours of lecture per week

Summer: 6 weeks - 7.5-9.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Pageler

Cognitive Science of Language: Read Less [-]

COG SCI 150 Sensemaking and Organizing 3 Units

Terms offered: Prior to 2007

When something "makes sense" or "is organized" we are imposing or discovering order in the arrangement of concepts, events, or resources of some kind. Sensemaking and organizing are fundamental human activities that raise many multi- or trans-disciplinary questions about perception, knowledge, decision making, interaction with things and with other people, values and value creation. We will analyze sensemaking and organizing from four interrelated perspectives. The most fundamental one is provided by language and culture, which shapes the perspectives one takes as an individual, in institutional contexts governed by business or legal processes, or in data-intensive or scientific contexts.

Sensemaking and Organizing: Read More [+]

Rules & Requirements

Prerequisites: Cognitive Science 1/1B/N1

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Glushko

Sensemaking and Organizing: Read Less [-]

COG SCI 170 Brain Damage 3 Units

Terms offered: Summer 2020 First 6 Week Session

This course introduces students to the full range of brain damage causes, which are: traumatic brain injury (TBI) - civilian vs. military, chronic traumatic encephalopathy (CTE), stroke, tumors, infections, hypoxia, addiction, neurological, and congenital conditions. We understand how brain damage caused by each condition leads to localized and non-localized deficits in the key functions comprising cognition, emotion, physiology, social skills, behavior, and daily functioning capacity. Key co-occurring disorders are covered that present due to the fundamental brain damage causes.

Brain Damage: Read More [+]

Objectives Outcomes

Course Objectives: We will explore various methods for measuring and diagnosing specific brain injuries. For example, TBI-induced axonal injury can be measured from structural perspective by diffusion tensor imaging, and from a neuropsychological perspective using the Glasgow Coma Scale. We will conclude by synthesizing all of this information into recommendations for treatment protocols of each specific brain injury, and a look at how the brain compensates for each condition's brain cell loss, which highlights the remarkable neuroplasticity of the brain.

Rules & Requirements

Prerequisites: CogSci 1/N1/1B and MCB C61/C64 or Psych 110 recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Isaac

Brain Damage: Read Less [-]

COG SCI 171 Genetic Factors in Neuropsychology 3 Units

Terms offered: Spring 2020

This course will explore genetic, environment, systems neuroscience to understand critical pathways that underlie the emergence of common diseases (Dementia), neuropathology of fear (Anxiety Disorders), neurodevelopmental disorders (ADHD, Autism), learning disabilities (e.g. Dyslexia), addiction (e.g. Alcoholism) and psychosis (Schizophrenia, Major Depressive Disorder). Seminal and current research will demonstrate how science and current technologies are transforming our knowledge of the interplay between genes, environment, brain development, and cognitive functioning.

Genetic Factors in Neuropsychology: [Read More](#) [+]

Objectives Outcomes

Course Objectives: Students will gain a deeper understanding of how genetic factors influence cognitive functioning. How do we assess cognitive domains and trace results to brain and genetic predisposition? How does neuropsychology contribute to our understanding of disease onset (pre-morbid functioning), progression (worsening symptoms) or knowing the difference between someone who is depressed with memory deficits and someone with early onset dementia memory deficits (e.g. differential diagnosis of pseudodementia)? We will conclude each lecture with a translational science discussion on how advancements in knowledge about genetic factors in neuropsychology is converting into precision medicine for pharmacological interventions, diagnostic procedures and preventive measures.

Rules & Requirements

Prerequisites: CogSci 1/N1/1B and MCB C61/C64 or Psych 110 preferred

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Isaac

Genetic Factors in Neuropsychology: [Read Less](#) [-]

COG SCI 172 Clinical Applications in Cognitive Neuroscience 3 Units

Terms offered: Spring 2020

Cognitive Neuroscience has provided a paradigm shift in our understanding of brain structure and function. We have excitingly transitioned from a scientific approach to brain science that relied primarily on overt behavioral observation and making anatomical inferences based on those behaviors to probing the brain in ways that were once considered inconceivable. Scientific and technology (imaging) developments now enable neuroscientists to view, investigate, measure, and influence the brain directly. An understanding of both structure and function then advances our knowledge of the mechanisms involved in cognitive processes underlying neural systems. For instance, what brain structures are involved, connected and work in concert to form new Clinical Applications in Cognitive Neuroscience: [Read More](#) [+]

Objectives Outcomes

Course Objectives: Students will also gain an appreciation of the relationship between healthy brain function and its breakdown (pathophysiology) in various disease states. Understanding disease states constitutes an important aspect of this course. Brain disorders change the neural circuits in the brain and cause it to malfunction during basic cognitive processes, such as memory and attention. We will compare how healthy neural circuits are functioning and draw inferences about the biological basis of the impacted cognitive processes.

Rules & Requirements

Prerequisites: CogSci 1/1B/N1 or MCBC61/C64 or Psych 101 preferred

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Isaac

Clinical Applications in Cognitive Neuroscience: [Read Less](#) [-]

COG SCI 180 Mind, Brain, and Identity 3 Units

Terms offered: Summer 2020 Second 6 Week Session, Spring 2020, Summer 2019 First 6 Week Session

Do you have a self or are you one? How is the self related to brain structure and function? Is the self, for example, identical to some part of the brain or part of the brain's function? Can you damage the self by damaging the brain? In this course we will look at these questions from conceptual, psychological, and neuroscientific perspectives. We will study both normal and injured brains to help shed light on what is a deeply philosophical and personal issue: What is the human the self. We will read various papers pertaining to these issues as well as the books listed under required reading.

Mind, Brain, and Identity: Read More [a]

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructor: Pageler

Mind, Brain, and Identity: Read Less [-]

COG SCI 181 The Cognitive Unconscious 3 Units

Terms offered: Summer 2020 Second 6 Week Session

This class is on the cognitive unconsciousness. This is the unconscious mind from a cognitive science point of view rather than one from psychoanalysis (though we will briefly touch on the psychoanalytic notions of the unconscious to clarify the distinction). The basic guide will be asking whether there is explanatory value to explaining human behavior with mental states or events that are not conscious to the person who has them. We say, for example, that a person flinched because they felt pain. Pain is a mental state that can explain the behavior (the flinch) of the person. Are there good reasons to think that some behaviors are explained by unconscious mental states? Cognitive science provides a strong reason to believe we can an

The Cognitive Unconscious: Read More [a]

Objectives Outcomes

Course Objectives: The objective of this course is to explore and understand the conceptual and empirical approaches to the cognitive unconscious from the multidisciplinary perspective of philosophy and cognitive science.

Student Learning Outcomes: Argue for or against theoretical positions in cognitive science. Based on 1) and 2), students will be able to argue for or against theoretical positions in this domain of cognitive science. Evaluate simple behavioral and neuroscientific experiments. Based on 1), students will be able to evaluate philosophical, neuroscientific, and psychological experiments regarding the demarcation of conscious and unconscious states.

Explain and apply knowledge of landmark findings and theories in cognitive science. Students will be able to explain a sense of the nature, demarcation, and function of conscious and unconscious mental states (events/ activity)

Rules & Requirements

Prerequisites: Cognitive Science 1/1B/N1 preferred

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Summer: 6 weeks - 7.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Pageler

The Cognitive Unconscious: Read Less [-]

COG SCI 182 The Cognitive Psychology of Concept and Idea Formation 3 Units

Terms offered: Summer 2020 First 6 Week Session, Spring 2020

This class will explore cognitive psychology and some neurological processing related to cognition and the formation and use of "ideas" or "concepts." We will discuss the modeling of idea and concept formation, the structures of memory, reasoning and problem solving, and meta-cognition, among others.

The Cognitive Psychology of Concept and Idea Formation: Read More [+]

Objectives Outcomes

Course Objectives: The objective of this course is to explore and understand the conceptual and empirical approaches to the cognitive unconscious from the multidisciplinary perspective of philosophy and cognitive science.

Student Learning Outcomes: Argue for or against theoretical positions in cognitive science. Based on 1) and 2), students will be able to argue for or against theoretical positions in this domain of cognitive science. Evaluate simple behavioral and neuroscientific experiments. Based on 1), students will be able to evaluate philosophical, neuroscientific, and psychological experiments regarding the demarcation of conscious and unconscious states.

Explain and apply knowledge of landmark findings and theories in cognitive science. Students will be able to explain a sense of the nature, demarcation, and function of conscious and unconscious mental states (events/ activity).

Rules & Requirements

Prerequisites: Cognitive Science 1/1B/N1 preferred

Hours & Format

Fall and/or spring: 15 weeks - 3-4 hours of lecture per week

Summer: 6 weeks - 7.5-9.5 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Pageler

The Cognitive Psychology of Concept and Idea Formation: Read Less [-]

COG SCI 190 Special Topics in Cognitive Science 3 Units

Terms offered: Fall 2019, Spring 2019, Spring 2018

Selected topics in the study of Cognitive Science.

Special Topics in Cognitive Science: Read More [+]

Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2-4 hours of seminar per week

Summer:

6 weeks - 6-8 hours of seminar per week

8 weeks - 4-8 hours of seminar per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Special Topics in Cognitive Science: Read Less [-]

COG SCI H195A Special Study for Honors Candidates 1 - 3 Units

Terms offered: Spring 2013, Spring 2012, Fall 2011

Independent study and preparation of an honors thesis under the supervision of a faculty member.

Special Study for Honors Candidates: Read More [+]

Rules & Requirements

Prerequisites: Open only to senior cognitive science majors in the honors program

Repeat rules: Course may be repeated for credit up to a total of 6 units.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Special Study for Honors Candidates: Read Less [-]

COG SCI H195B Special Study for Honors Candidates 1 - 3 Units

Terms offered: Spring 2011, Spring 2008, Spring 2007
Independent study and preparation of an honors thesis under the supervision of a faculty member.

Special Study for Honors Candidates: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Open only to senior cognitive science majors in the honors program

Repeat rules: Course may be repeated for credit up to a total of 6 units.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Special Study for Honors Candidates: Read Less [\[-\]](#)

COG SCI 197 Academic Internship Credit 1 - 3 Units

Terms offered: Summer 2017 10 Week Session
Academic internship credit for students pursuing an internship related to their studies in the Cognitive Science Program. Limited to Cognitive Science declared majors with at least 60 units, and a 2.0 GPA.
Academic Internship Credit: Read More [\[+\]](#)

Rules & Requirements

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 2-7 hours of independent study per week

Summer: 10 weeks - 4-11 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Academic Internship Credit: Read Less [\[-\]](#)

COG SCI 198 Directed Group Study 1 - 4 Units

Terms offered: Spring 2016, Fall 2015, Spring 2015
Seminar for the group study of selected topics. Topics may be initiated by students subject to the approval of the major advisor.

Directed Group Study: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Upper division standing and consent of instructor

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Directed Group Study: Read Less [\[-\]](#)

COG SCI 199 Independent Study in Research 1 - 4 Units

Terms offered: Fall 2015, Fall 2014, Spring 2013
Independent study and research by arrangement with faculty.
Independent Study in Research: Read More [\[+\]](#)

Rules & Requirements

Prerequisites: Restricted to juniors and seniors

Repeat rules: Course may be repeated for credit without restriction.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer: 8 weeks - 1.5-7.5 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

Independent Study in Research: Read Less [\[-\]](#)