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 advisor (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 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).

Summary of Major Requirements

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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 (Psych 110 can also fulfill this requirement) 3
or MCELLBI C6 Exploring the Brain: Introduction to Neuroscience
MATH 55 Discrete Mathematics 4
or COMPSCI 7 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
Select three courses from the following list:

**Psychology**
- PSYCH 164 Social Cognition
- PSYCH 140 Developmental Psychology
- PSYCH 147 Methods in Cognitive Development

**Computational Modeling**
- COG SCI 131 Computational Models of Cognition
- COMPSCI 188 Introduction to Artificial Intelligence

**Linguistics**
- COG SCI C101 LINGUIS C105
- COG SCI LINGUIS C142
- LINGUIS 100 Introduction to Linguistic Science
- LINGUIS 108 Psycholinguistics
- COG SCI C147 Course Not Available

**Philosophy**
- PHILOS 3 The Nature of Mind
- PHILOS 12A Introduction to Logic
- PHILOS 25A Ancient Philosophy
- PHILOS 25B Modern Philosophy
- CLASSIC 36 Greek Philosophy
- PHILOS 122 Theory of Knowledge
- PHILOS 132 Philosophy of Mind
- PHILOS 133 Philosophy of Language
- PHILOS 135 Theory of Meaning
- PHILOS 136 Philosophy of Perception

**Society, Culture, and Cognition**
- ANTHRO 166 Language, Culture, and Society
- INFO 103 History of Information
- ECON 119 Psychology and Economics
- EDUC 140AC W140/W140A The Art of Making Meaning: Educational Perspectives on Literacy and Learning in a Global World
- LINGUIS 150 Sociolinguistics
- PSYCH 107 Buddhist Psychology
- PSYCH 160 Social Psychology
- PSYCH 164 Social Cognition
- PSYCH 166AC Cultural Psychology
- SOCIOL 150 Social Psychology

**Upper Division Electives**

In addition to completing the six distribution groups, students must complete at least three additional elective courses. Please submit an elective petition form if you want to ask for a course not listed below to count as an elective for the major. The course must have an explicit connection to the study of the mind.

Select three courses from the following list:

- ANTHRO 149 Psychological Anthropology
- ANTHRO 160AC Forms of Folklore
- ANTHRO 161 Narrative Folklore
- COG SCI C140 LINGUIS C160
- COMPSCI 160 User Interface Design and Development
- COMPSCI 170 Efficient Algorithms and Intractable Problems
- COMPSCI 186 Introduction to Database Systems
- COMPSCI VIS SCI C280
- COMPSCI 287 Advanced Robotics
- COMPSCI 288 Natural Language Processing
- EDUC 224A Mathematical Thinking and Problem Solving
- EDUC C229A/PSYCH C223 Proseminar: Problem Solving and Understanding
- LINGUIS 106 Metaphor
- LINGUIS 110 Phonetics
- LINGUIS 115 Morphology
- LINGUIS 120 Syntax
- LINGUIS 121 Formal Semantics
- LINGUIS 123 Pragmatics
- LINGUIS 125 Gesture, Cognition, and Culture
- LINGUIS 130 Comparative and Historical Linguistics
- LINGUIS/SLAVIC Language Spread C139
- LINGUIS 151 Language and Gender
- LINGUIS 158 Computational Methods
- LINGUIS 170 History, Structure, and Sociolinguistics of a Particular Language
- LINGUIS 181 Lexical Semantics
- MCELLBI 160 Cellular and Molecular Neurobiology
- MCELLBI 160L Neurobiology Laboratory
- MCELLBI 161 Circuit, Systems and Behavioral Neuroscience
- MCELLBI 165 Neurobiology of Disease
- MCELLBI 166 Biophysical Neurobiology
- MEDIAST 101 Visual Culture
- MEDIAST 102 Course Not Available
- MUSIC 108/108M Music Perception and Cognition
- NATAMST 151 Native American Philosophy
- PHILOS 128 Philosophy of Science
- PHILOS 138 Philosophy of Society
- PHILOS 140A Intermediate Logic
- PHILOS 140B Intermediate Logic
- PHILO 176 Hume
- PHILO 178 Kant
- PHILO 185 Heidegger
- PHILO 186B Later Wittgenstein
- PHILO 188 Phenomenology
- POL SCI 161 Public Opinion, Voting and Participation
- POL SCI 164A Political Psychology and Involvement
- PSYCH 114 Biology of Learning
- PSYCH 121 Animal Cognition
- PSYCH 125 The Developing Brain
- PSYCH 167AC Stigma and Prejudice
- RHETOR 103A Approaches and Paradigms in the History of Rhetorical Theory
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/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/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/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/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/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/undergraduate/colleges-schools/letters-science/#breadthrequirementstext)

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. Intercampus 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.
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://icbbs.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.

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.

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.

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.

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 N120. A deficient grade in PSYCH N120 may be removed by taking PSYCH C120.

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 C101

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 C126

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

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.
The course will be relevant for students interested in cognitive science, psychology, neuroscience, or related fields.
Cognitive Neuroscience: 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 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.

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 More [+]

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.

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.

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.

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 More [+]

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 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 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 [+]

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

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 [+]

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 metacognition, 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 [-]

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**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 [-]

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**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**
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 [-]