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. Once prerequisites are completed, students may submit the Cognitive Science declaration submission form (https://cogsci.berkeley.edu/major-program/how-declare/). Students interested in the major should consult the Cognitive Science website (http://cogsci.berkeley.edu/). If students have questions or would like to speak to someone about the major or other academic issue, they should schedule an appointment with a Cognitive Science academic advisor. (https://cogsci.berkeley.edu/undergraduate-program/advising/) The Cognitive Science office is located in 101 Stephens Hall.

Honors Program

Please see the Cognitive Science program's Honors page for additional details. (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. Each lower division prerequisite must be completed with a grade of C- or better.
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 H195, 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 (https://guide.berkeley.edu/archive/).

Summary of Major Requirements

Lower division prerequisites: three courses	10-12
Additional lower division requirements: three courses	10-11
Upper division distribution requirements: six courses	18-24
Upper division electives: three courses	9-12
Total Units	**47-59**

Lower Division Prerequisites

MATH 51	Calculus I (Preferred [MATH 51 as of Fall 2025])	4
or MATH 10A	Methods of Mathematics: Calculus, Statistics, and Combinatorics	
or MATH 16A	Analytic Geometry and Calculus	
COMPSCI/STAT C8	Foundations of Data Science	4
or STAT 20	Introduction to Probability and Statistics	
or STAT 2	Introduction to Statistics	
COMPSCI 61A	The Structure and Interpretation of Computer Programs	3-4
or ENGIN 7	Introduction to Computer Programming and Numerical Methods	
or COMPSCI C88C	Computational Structures in Data Science	

Lower Division Requirements

COG SCI 1	Introduction to Cognitive Science	4
or COG SCI 1B	Introduction to Cognitive Science	
or COG SCI N1	Introduction to Cognitive Science	
MATH 55	Discrete Mathematics	4
or COMPSCI 70	Discrete Mathematics and Probability Theory	
PSYCH C61	Brain, Mind, and Behavior	3
or PSYCH C64	Exploring the Brain: Introduction to Neuroscience	
or PSYCH 110	Introduction to Biological Psychology	

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
COG SCI 132	Rhythms of the Brain: from Neuronal Communication to Function	4
PSYCH 117	Human Neuropsychology	3
PSYCH 133	Psychology of Sleep	3
PSYCH 114	Biology of Learning	3
COG SCI C126	Perception	3
COG SCI 170	Brain Damage	3
COG SCI 171	Genetic Factors in Neuropsychology	3
COG SCI 172	Clinical Applications in Cognitive Neuroscience	3

Cognitive Psychology		
COG SCI C100/ PSYCH C120	Basic Issues in Cognition	3
COG SCI/ PSYCH C126	Perception	3
COG SCI 115	Neuropsychology of Happiness	3
COG SCI 181	The Cognitive Unconscious	3
COG SCI 182	The Cognitive Psychology of Concept and Idea Formation	3
LINGUIS C146/ PSYCH C143	Language Acquisition	3
PSYCH 125	The Developing Brain	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
COG SCI 132	Rhythms of the Brain: from Neuronal Communication to Function	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 144	Cognitive Science of Language	3
LINGUIS 100	Introduction to Linguistic Science	4
LINGUIS 108	Psycholinguistics	3
Philosophy		
AGRS 36	Greek Philosophy	4
COG SCI 180	Mind, Brain, and Identity	3
PHILOS 3	The Nature of Mind	4
PHILOS 12A	Introduction to Logic	4
PHILOS 25A	Ancient Philosophy	4
PHILOS 25B	Modern 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		
AFRICAM 115	Language and Social Issues in Africa	3
ANTHRO 149	Psychological Anthropology	4
ANTHRO 166	Language, Culture, and Society	4
COG SCI 181	The Cognitive Unconscious	3
INFO 103	Course Not Available	
ECON 119	Psychology and Economics	4
EDUC 130	Knowing and Learning in Mathematics and Science	3
EDUC 132	Language Learning in Chicanx/Latinx Communities	4
EDUC 140AC/ W140/W140A	The Art of Making Meaning: Educational Perspectives on Literacy and Learning in a Global World	4
LINGUIS 109	Bilingualism	3
LINGUIS 150	Sociolinguistics	3
LINGUIS 150A	Concepts, Theories, and Methodologies of Sociolinguistics	4
PSYCH 163	Development of Prejudice and Bias	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 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:

AFRICAM C134	Information Technology and Society	4
ART 178	Advanced Digital Media: Game Design Methods	4
ANTHRO 160AC	Forms of 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	Course Not Available	4
MCELLBI 160L	Course Not Available	4
MCELLBI 166	Course Not Available	
MEDIAST 101	Visual Culture	4
MEDIAST 111B	Text and Data Media History	4
MEDIAST 111	Media History	4

MEDIAST 112	Media Theories and Processes	4
MEDIAST 113	Media and Democracy	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 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
ENGLISH 172	Literature and Psychology	4
ESPM 161	Environmental Philosophy and Ethics	4
FILM 179	Understanding Film Sound	4
HISTORY C182C	Introduction to Science, Technology, and Society	4
HISTORY C184D	Human Contexts and Ethics of Data - DATA/ History/STS	4
ISF 100J	The Social Life of Computing	4
INFO 159	Natural Language Processing	4
INFO C265	Interface Aesthetics	3
INFO 188	Behind the Data: Humans and Values	3
INTEGBI C143A	Biological Clocks: Physiology and Behavior	3
LEGALST 181	Psychology and the Law	4
LEGALST 183	Psychology of Diversity and Discrimination in American Law	4
LINGUIS 108	Psycholinguistics	3
LINGUIS 124	Discourse	3
LINGUIS C160	Quantitative Methods in Linguistics	4
LINGUIS 187	Writing as Framing	3
MATH 110	Abstract Linear Algebra	4
MEDIAST 111	Media History	4
MEDIAST 111B	Text and Data Media History	4
MEDIAST 111C	Audio-Visual Media History	4
MEDIAST 112	Media Theories and Processes	4
PSYCH 156	Human Emotion	3
PSYCH 124	The Evolution of Human Behavior	3
PSYCH 137	Mind-Body and Health	3
PHILOS 110	Aesthetics	4
PHILOS 125	Metaphysics	4
PHILOS 128	Philosophy of Science	4
PHILOS 136	Philosophy of Perception	4
PHILOS 141	Philosophy and Game Theory	4
PHILOS 107	Moral Psychology	4
PHILOS 151	Early Chinese Thought	4
PHILOS 154	Arabic Philosophy	4
PHILOS 170	Descartes	4
PHILOS 186	Merleau-Ponty	4
MELC 156	Sociolinguistics of the Middle East	4
NWMEDIA C203	Critical Making	4
POL SCI C135	Game Theory in the Social Sciences	4
POL SCI 164A	Political Psychology and Involvement	4
PSYCH 101	Research and Data Analysis in Psychology	4
PSYCH C115C	Neuroethology: Complex Animal Behaviors and Brains	4
PSYCH 136	Human Sexuality	3
PSYCH 156	Human Emotion	3
PSYCH 169	Love & Close Relationships	3
PSYCH 115	Introduction to Brain Imaging Analysis Methods	3
SPANISH 100	Introduction to Hispanic Linguistics	4
SPANISH 166	Foreign Language Acquisition and Pedagogy for Spanish Language Instruction	4
STAT C140	Probability for Data Science	4
STAT 134	Concepts of Probability	4
UGBA 105	Leading People	3
UGBA 136F	Behavioral Finance	3
UGBA 143	Game Theory and Business Decisions	3
UGBA 160	Customer Insights	3
UGBA 192AC	Social Movements and Social Media	3
NEU 100B	Circuit, Systems and Behavioral Neuroscience	4
NEU 165	Neurobiology of Disease	3

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

For a detailed lists of L&S requirements, please see Overview tab to the right in this guide or visit the L&S Degree Requirements (https://lsadvising.berkeley.edu/degree-requirements/) webpage. For College advising appointments, please visit the L&S Advising (https://lsadvising.berkeley.edu/home/) Pages.

University of California Requirements

Entry Level Writing

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 and must be taken for a letter grade.

American History and American Institutions

The American History and American Institutions requirements are based on the principle that all U.S. residents who have graduated from an

American university should have an understanding of the history and governmental institutions of the United States.

Berkeley Campus Requirement

American Cultures

All undergraduate students at Cal need to take and pass this campus requirement 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 are plentiful and 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

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

Foreign Language

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 taken for a letter grade.

Reading and Composition

In order to provide a solid foundation in reading, writing, and critical thinking the College of Letters and Science requires two semesters of lower division work in composition in sequence. Students must complete parts A & B reading and composition courses in sequential order by the end of their fourth semester for a letter grade.

College of Letters & Science 7 Course Breadth Requirements

Breadth Requirements

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 at Cal for four years, or two years for transfer students. In general, there is no need to be concerned about this requirement, unless you graduate early, 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 L&S College 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 B.A. 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.
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.

Major maps are experience maps that help undergraduates plan their Berkeley journey based on intended major or field of interest. Featuring student opportunities and resources from your college and department as well as across campus, each map includes curated suggestions for planning your studies, engaging outside the classroom, and pursuing your career goals in a timeline format.

Use the major map below to explore potential paths and design your own unique undergraduate experience:

View the Cognitive Science Major Map. (https://discovery.berkeley.edu/getting-started/major-maps/cognitive-science/)

Graduate Study

Berkeley offers a Designated Emphasis in Cognitive Science (https://guide.berkeley.edu/graduate/degree-programs/cognitive-science/) for graduate students. 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/).

Honors

Students who meet the grade point thresholds 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 an eligible member of the Cognitive Science faculty (https://cogsci.berkeley.edu/major-program/honors-program/list-potential-honors-project-first-readers/) and marked by satisfactory completion of the required research and writing. 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

COG SCI 1 Introduction to Cognitive Science 4 Units

Terms offered: Fall 2025, Summer 2025 First 6 Week Session, Summer 2025 Second 6 Week Session

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.

Rules & Requirements

Credit Restrictions: Students will receive no credit for COG SCI 1 after completing COG SCI C1, COG SCI N1, or COG SCI 1B. A deficient grade in COG SCI 1 may be removed by taking COG SCI C1, COG SCI N1, or COG SCI 1B.

Hours & Format

Fall and/or spring: 15 weeks - 3-4 hours of lecture and 2-0 hours of laboratory per week

Summer:
6 weeks - 7.5-5 hours of lecture and 0-2 hours of laboratory per week
8 weeks - 9-7.5 hours of lecture and 0-2 hours of laboratory per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI 1B Introduction to Cognitive Science 3 Units

Terms offered: Spring 2024, Fall 2023, Spring 2023
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.
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.

COG SCI N1 Introduction to Cognitive Science 3 Units

Terms offered: Summer 2023 Second 6 Week Session, Summer 2022 First 6 Week Session, Summer 2022 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.
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

COG SCI 88 Data Science and the Mind 2 Units

Terms offered: Fall 2020, Spring 2019, Spring 2018
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.
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.

COG SCI 98 Directed Group Study 1 - 4 Units

Terms offered: Spring 2023, Spring 2022, Fall 2021
Seminar for the group study of selected topics. Topics may be initiated by students subject to the approval of the major advisor.
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.

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.
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.

COG SCI C100 Basic Issues in Cognition 3 Units

Terms offered: Fall 2025, Summer 2025 First 6 Week Session, Spring 2025, Spring 2024
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.
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 - 2-4 hours of lecture and 2-0 hours of discussion per week

Summer:
6 weeks - 5-7.5 hours of lecture and 2.5-0 hours of discussion per week
8 weeks - 3.5-5.5 hours of lecture and 2-0 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

COG SCI N100 Basic Issues in Cognition 3 Units

Terms offered: Summer 2023 First 6 Week Session, 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.
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

COG SCI C101 Cognitive Linguistics 4 Units

Terms offered: Spring 2021, Summer 2019 8 Week Session, Spring 2019

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.
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

COG SCI 110 Practical Applications for Artificial Intelligence 2 Units

Terms offered: Summer 2025 Second 6 Week Session
This course provides an overview of some current innovations in artificial intelligence and their most salient application in the fields of healthcare, psychotherapy, transportation, web-based applications, robotics and more. Specific technical innovations that enable what is known as the AI revolution will be discussed including Artificial Neural Networks, computer vision, and natural language processing. The course will be project-based, and guest lecturers will be invited to share their expertise and experience working in the field.

Hours & Format

Summer: 6 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Chan

COG SCI 111 Building AI for Business: From Concept to Venture 4 Units

Terms offered: Not yet offered
This hands-on course equips students with the practical skills and knowledge needed to design, build, and launch AI-powered applications with a special focus on AI agents, that is, programs that can act on their own, such as virtual assistants, chatbots, and robotic agents. Students will learn fundamental AI concepts while applying them to real business problems. This course is designed to help students build technical skills and an entrepreneurial mindset through interactive homework, guest lecturers by industry professionals, and collaborative problem-solving. The course culminates in students building and launching a working AI application of their own that addresses a real-world problem.

Objectives & Outcomes

Course Objectives: By the end of this course, students will be able to:
1. Understand core concepts of AI agents, such as virtual assistants, chatbots, and robotic agents, and their practical applications
2. Design and implement AI-powered solutions to real-world problems, using modern tools and frameworks
3. Build, launch, and maintain a working AI application of their own
4. Conduct effective industry research and stakeholder interviews
5. Develop and present compelling business cases for AI solutions
6. Work effectively in teams to deliver complex technical projects

Hours & Format

Summer: 6 weeks - 4-6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

Grading/Final exam status: Letter grade. Alternate method of final assessment during regularly scheduled final exam group (e.g., presentation, final project, etc.).

Instructor: Chan

COG SCI 112 Uncovering the Cognitive Science Behind the User Experience 3 Units

Terms offered: Summer 2025 Second 6 Week Session, Spring 2025
In an increasingly digital world, understanding the interaction between human cognition and technology is central to both designing and using technology effectively. This course investigates the reciprocal relationship between the human mind and digital interfaces, with a focus on how cognitive science—encompassing cognitive load, attention, memory, perception, and decision-making—shapes and is shaped by technology. Students will analyze existing apps and create their own, gaining insight into UX principles grounded in cognitive science to create intuitive, accessible, and efficient designs. Through hands-on research and app prototyping, students will bridge the gap between theory and practice, refining their UX design skills.

Objectives & Outcomes

Course Objectives: Collaborate effectively in teams to conduct research, critique designs, and present findings.

Conduct user experience research using methods such as user interviews, surveys, and usability testing.

Critically evaluate existing digital interfaces based on cognitive science theories.

Design an app or interface that addresses a specific problem, using UX principles to enhance the user experience.
Understand and apply cognitive science principles in the context of UX design.

Hours & Format

Fall and/or spring: 15 weeks - 2-3 hours of lecture and 1-0 hours of discussion per week

Summer: 6 weeks - 4-6 hours of lecture and 2-0 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Lanska

COG SCI 115 Neuropsychology of Happiness 3 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024
This course will explore cognitive and affective components of happiness and distress, including pleasure, meaning, and well-being, sadness, fear, and anger. Also, negative thought patterns associated with various psychological disorders, including mood disorders, anxiety disorders, and PTSD, and their neurological underpinnings. Then we will turn to the new field of self-directed neuroplasticity to explore evidence-based psychotherapeutic techniques for transforming negative thoughts and cultivating positive ones, including mindfulness, gratitude, and CBT-based techniques. We will compare these to psychoactive drugs and brain stimulation used to treat such disorders. We will also look at recent developments in neuroimaging data.

Hours & Format

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

Summer: 6 weeks - 7.5-8 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Chan

COG SCI C126 Perception 3 Units

Terms offered: Spring 2025, Spring 2024, Spring 2023
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.

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 2025, Spring 2025, Fall 2024
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.

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

COG SCI 131 Computational Models of Cognition 4 Units

Terms offered: Fall 2025, Summer 2025 8 Week Session, Spring 2025
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.

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 - 4-3 hours of lecture and 0-1 hours of discussion per week

Summer: 8 weeks - 6-8 hours of lecture and 2-0 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI C131 Computational Models of Cognition 4 Units

Terms offered: Spring 2025, Fall 2023, Spring 2022, Fall 2020
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.

Rules & Requirements

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

Credit Restrictions: Students will receive no credit for COG SCI C131 after completing COG SCI 131. A deficient grade in COG SCI C131 may be removed by taking COG SCI 131.

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

COG SCI 132 Rhythms of the Brain: from Neuronal Communication to Function 4 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024
This course provides advanced students in cognitive science, psychology, computer science, and biology with the skills to develop numerical methods used in the study of neuroscience and cognition. We will study several main areas in neuroscience and cognition: memory and the underlying communication between hippocampus and cortical areas; movement control through the study of the cortico-basal-thalamic loops. Modulation of mesolimbic and nigrostriatal pathways by dopamine. Modulation of cortico-hippocampal circuits by acetylcholine and the role of these circuits in the onset of Alzheimer disease. We will study the coherence of electrical oscillations in different parts of the brain and how that coherence can be disturbed in disease.

Rules & Requirements

Prerequisites: Prerequisites are a basic familiarity with programming (as might be obtained from COMPSCI 61A or ENG 7), exposure to cognitive science (e.g., CogSci 1/N1/1B), comfort with basic calculus (e.g. Math 51, Math 10A, or Math 16A), and discrete math (e.g. Math 55)

Hours & Format

Fall and/or spring: 15 weeks - 4-6 hours of lecture per week

Summer: 8 weeks - 9-6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI 138 Optical Illusions: Brain, Machine, World 2 - 3 Units

Terms offered: Summer 2025 3 Week Session
Optical illusions are entertaining, but more than just visual tricks: They reveal deep insights into perception. This course critically explores what constitutes an illusion, and how an expansive definition can bridge human and machine perception. Illusions appear in nature, art, and our increasingly digital world. We'll learn how to measure illusion perception in both humans and machines, and examine state-of-the-art machine perception through the lens of illusion—exploring machine hallucination, image generation, and adversarial imagery. This three-week intensive blends lectures, discussions, readings, hands-on labs, and a research project.

Objectives & Outcomes

Student Learning Outcomes: 1.
Learn ways in which optical illusions have been defined, as well as challenges in doing so
2.
Discover the broad range of ways illusions occur in the world from naturally-occuring illusions to those intentionally designed for art, public and digital spaces
3.
Understand research methods for measuring illusion perception and ways that has informed either the underlying neural mechanisms or understanding of the strengths and limitations of machine perception
4.
Compare and contrast human and machine perception, identifying their respective reactions to illusions
5.
Discover illusions that may emerge from machine learning models

Rules & Requirements

Prerequisites: Introductory understanding of human vision, such as Cognitive Science C126 or similar Introductory understanding of machine learning and vision, such as Data Science C8, Computer Science 180, Computer Science 182, Computer Science 189, or similar Familiarity with Python and Jupyter notebooks

Hours & Format

Summer:
3 weeks - 7-15 hours of lecture per week
6 weeks - 4.5-6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI 139 Art, Geometry and Cognition 4 Units

Terms offered: Summer 2025 Second 6 Week Session, Fall 1997, Fall 1995

The objective of this course is to provide advanced students in cognitive science, humanities and science with the tools to analyze and understand how neural activity in many areas of the brain shows a geometrical ordering that can be thought to occur in topological manifolds that is important for spatial and explicit memory encoding, the neural code. The second goal of the class is to explore the geometrical representation of art with the corresponding map of the brain topology that supports the original artistic representation.

Rules & Requirements

Prerequisites: Compsci 10, Data C8, CS 61A or other course that provides the basics of the Python Programming Language; Math 1A, 51, 16A, or 10A or equivalent introduction to Calculus; and CogSci 1 or CogSci C100 (can be taken concurrently)

Credit Restrictions: Students will receive no credit for COG SCI 139 after completing COG SCI 139. A deficient grade in COG SCI 139 may be removed by taking COG SCI 139.

Hours & Format

Fall and/or spring: 15 weeks - 3-4 hours of lecture and 1-0 hours of discussion per week

Summer: 6 weeks - 4-6 hours of lecture and 2-0 hours of discussion per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI C140 Quantitative Methods in Linguistics 4 Units

Terms offered: Fall 2025, Fall 2024, Fall 2022

An introduction to quantitative methods for linguistic analysis and applications. Students will be introduced to statistical modeling techniques for linguistic datasets, as well as models that have applications in natural language processing. The class will make use of programming languages (R and/or Python) as necessary—e.g., for data visualization and modeling.

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

Summer: 6 weeks - 8 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.

Instructor: Gahl

Also listed as: LINGUIS C160

COG SCI C142 Language and Thought 3 Units

Terms offered: Fall 2025, Fall 2024, Fall 2023, Summer 2023 Second 6 Week Session

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.

Hours & Format

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

Summer: 6 weeks - 8 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

COG SCI 144 Cognitive Science of Language 3 Units

Terms offered: Spring 2023, 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.

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

COG SCI 145 Slurs and Stereotypes 3 Units

Terms offered: Prior to 2007

Throughout this course we will draw upon theoretical and experimental research articles to study a variety of important topics in the slurs and stereotypes literature including the brain and cognitive components involved in processing slurs and stereotypes, the relationship between the content of slurs and stereotypical attributes of their targets, the semantics and pragmatics of slurs, classical and prototype theories of concepts, negative and positive stereotypes, derogatory and non-derogatory uses of slurs, contextual factors that influence the interpretation of slurs, social communication of power and status, and slur reclamation or appropriation. Philosophical, experimental, corpus-based, and computational methods will be explored.

Objectives & Outcomes

Course Objectives: Students will develop their understanding of cognitive science by reading a collection of original research articles focusing on slurs and stereotypes. Becoming proficient with this literature will help students understand the current state of the field so that they can evaluate strengths and weaknesses of different views about slurs and stereotypes, formulate new research questions, and develop original ideas for further studying
slurs and stereotypes on their own. By reading original articles about slurs and stereotypes from different subfields of cognitive science, including linguistics, psychology, philosophy, and cognitive neuroscience, students will also improve their ability to evaluate and prepare arguments, understand experimental design, collect data, read tables and figures, and interpret results. By completing two quizzes over the course of the semester, students will gain a foundational understanding about the literature on slurs and stereotypes.

Hours & Format

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

Summer: 6 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Croom

COG SCI 146 Music, Language, and Cognition 3 Units

Terms offered: Summer 2023 Second 6 Week Session
Humans across all time periods and cultures have engaged in musical and linguistic activity, but why do all humans engage in these two peculiar kinds of complex behaviors? The purpose of this course is to introduce students to embodied, cognitive perspectives on music and language through the study of a range of topics about music and language including jazz improvisation, the evolution of rhythm processing, and birdsong, to name a few. By completing this course students will gain insight into one of the most fascinating areas of research in cognitive science today and build an understanding of the central roles that music and language play in our mental and social life.

Rules & Requirements

Prerequisites: Recommended: CogSci 1, 1B, or N1

Hours & Format

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

Summer: 6 weeks - 4-8 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Croom

COG SCI 150 Sensemaking and Organizing 3 Units

Terms offered: Spring 2025, Spring 2024, Spring 2023
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

COG SCI 151 Models of Decision-Making from Brain to Behavior 3 Units

Terms offered: Fall 2025
This course offers an interdisciplinary exploration of how decisions are made by individuals and organizations. We will explore theories and models from psychology, neuroscience, economics, and their applications to fields such as medicine, business, public policy, and technology. You will learn about the cognitive biases, societal factors, and neural mechanisms which shape our decision making processes, and how computational models can be designed to explain and inform decision making in different aspects of life. The course will focus on the concepts underlying computational models and will not cover fitting models to data, but will develop your ability to interpret graphs, understand computational models, and assess statistical results.

Hours & Format

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

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

Instructor: Odean

COG SCI 170 Brain Damage 3 Units

Terms offered: Summer 2021 First 6 Week Session, Spring 2021, Fall 2020

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.

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

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.

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

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

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

COG SCI 173 Brain-Computer Interfaces 3 Units

Terms offered: Summer 2025 First 6 Week Session

This course bridges neuroscience and technology, providing a comprehensive exploration of brain-computer interfaces (BCIs), cutting edge neural technology, and their applications in health, research, and consumer technology. Students will engage with topics like neural data collection, signal processing, deep brain stimulation, optogenetics, and non-invasive BCIs, with a focus on research and therapeutic applications. A key component of the course is hands-on student projects. These projects may involve analyzing neuroscience data sets, developing interactive apps, designing experiments, or exploring innovative solutions at the intersection of technology and the brain.

Hours & Format

Summer: 6 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

COG SCI 180 Mind, Brain, and Identity 3 Units

Terms offered: Fall 2025, Fall 2024, Spring 2024

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.

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.

COG SCI 181 The Cognitive Unconscious 3 Units

Terms offered: Spring 2025, Fall 2024, 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

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

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.

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

COG SCI 190 Special Topics in Cognitive Science 3 Units

Terms offered: Spring 2025, Spring 2023, Fall 2022
Selected topics in the study of Cognitive Science.
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.

COG SCI H195 Special Study for Honors Candidates 1 - 6 Units

Terms offered: Spring 2023
Independent study and preparation of an honors thesis under the supervision of a faculty member.
Rules & Requirements

Prerequisites: Students must complete their pre-honors research as well as their honors methods requirement before applying to the honors program in Cogsci. Once accepted to the honors program, they will be enrolled in the appropriate number of H195 units

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

Hours & Format

Fall and/or spring: 15 weeks - 3-0 hours of independent study per week

Summer: 8 weeks - 5.5-0 hours of independent study per week

Additional Details

Subject/Course Level: Cognitive Science/Undergraduate

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

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

Terms offered: Spring 2024, Spring 2013, Spring 2012
Independent study and preparation of an honors thesis under the supervision of a faculty member.
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.

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.
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.

COG SCI 197 Academic Internship Credit 0.5 - 4 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.
Rules & Requirements

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

Hours & Format

Fall and/or spring: 15 weeks - 1-9 hours of independent study per week

Summer: 10 weeks - 1-12 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.

COG SCI 198 Directed Group Study 1 - 4 Units

Terms offered: Fall 2025, Spring 2025, Fall 2024
Seminar for the group study of selected topics. Topics may be initated by students subject to the approval of the major advisor.

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.

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.

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.