

Cognitive Science

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Cognitive science explores the nature of cognitive processes such as perception, reasoning, memory, attention, language, decision making, imagery, motor control, and problem solving. The goal of cognitive science, stated simply, is to understand how the mind works. Cognitive science is an inherently interdisciplinary endeavor, drawing on tools and ideas from fields such as psychology, computer science, linguistics, philosophy, economics, and neuroscience. Approaches include empirical studies of the ontogenetic and phylogenetic development of cognitive abilities, experimental work on cognitive processing in adults, attempts to understand perception and cognition based on patterns of breakdown in pathology, computational and robotic research that strives to simulate aspects of cognition and behavior, neuroscientific investigations of the neural bases of cognition using neural recording and brain scanning, and the development of philosophical theories of the nature of mind.

PREREQUISITE

An introductory survey course, CGSC 1100, is normally taken by the end of the fall term of the sophomore year and prior to admission to the major.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

See Links to the attributes indicating courses approved for Cognitive Science major requirements.

The requirements of the major for the B.S. and B.A. degrees are the same, except for the senior requirement. Fifteen term courses, for a total of thirteen and one half course credits, are required for the major, including the introductory course and the senior requirement. Each major program must include the elements described below. The particular selection of courses must be approved by the director of undergraduate studies (DUS) in order to assure overall coherence. No course may be used to fulfill more than one requirement for the major.

Breadth requirement A breadth requirement introduces students to the subfields of cognitive science. Each major is required to take a course from four of the following six areas:

1. Computer science: CPSC 2010
2. Economics and decision making: ECON 2159
3. Linguistics: LING 1100, LING 1160, 1300, 1179, 2320, 2530
4. Neuroscience: MCDB 3200, NSCI 3400, PSYC 1600, 2670
5. Philosophy: PHIL 1126, 1182, 2269, 2270, 2271
6. Psychology: PSYC 1100, S139E, 1400

Depth requirement Students fulfill a depth requirement by completing six courses that focus on a specific topic or area in cognitive science. The depth courses must be chosen from at least two disciplines, and are typically drawn from the six cognitive science subfields. It may be possible to draw depth courses from other fields when necessary to explore the student's focal topic, in consultation with the DUS. All six depth courses must be intermediate or advanced; for most disciplines, courses numbered 3000 or above fulfill the requirement. With permission of the DUS, up to two directed reading or research courses may count toward the depth requirement.

Skills requirement Because formal techniques are fundamental to cognitive science, one skills course is required, preferably before the senior year. Courses that fulfill the skills requirement include CPSC 1001, 2020, LING 2249, PSYC 2670, S&DS 1000, 2200, 2300, and S107E. Other courses may fulfill this requirement with the permission of the DUS.

Junior colloquium In the junior year, students are required to take CGSC 3950, a half-credit colloquium in which majors discuss current issues and research in cognitive science and select a senior essay topic.

Repeat for credit Only one term of CGSC 4710, 4720, 4730, or 4740 may be offered toward the major.

Credit/D/Fail No course taken Credit/D/Fail may be applied toward the requirements of the major, except with permission of the DUS.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

In the senior year, students take a full-credit capstone course in which the senior essay is written. Students in the course meet regularly with one another and with the faculty member to discuss current work in cognitive science and their own developing research projects. Students must take this course during their senior year.

B.S. degree program The B.S. degree requires two half-credit courses for one-course credit of empirical research, CGSC 4900 and 4910. These courses are only open to Cognitive Science seniors and receive a letter grade. This normally includes designing an experiment and collecting and analyzing data.

B.A. degree program The B.A. degree requires two half-credit courses for one-course credit of nonempirical research, CGSC 4800 and 4810. These courses are only open to Cognitive Science seniors and receive a letter grade. There are no restrictions on the research format.

ADVISING AND APPLICATION TO THE MAJOR

Students may apply to enter the major at any point after the first year. Applications must be submitted online through Qualtrics. Applications must include (1) an official or unofficial transcript of work at Yale, (2) a brief statement of purpose, which indicates academic interests and expected focus within the areas of the Cognitive Science major, and (3) a list of the six upper-level courses that the student plans to take as part of

the research focus. The application link and answers to frequently asked questions are available on the program website.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisite CGSC 1100

Number of courses 15 term courses, for a total of 13.5 course credits (incl prereq and senior req)

Specific course required CGSC 3950

Distribution of courses 1 course each in 4 of 6 subfields, as specified for breadth req; 6 courses in a specific topic or area, as specified for depth req; 1 skills course, as specified

Senior requirement B.S. – CGSC 4900 and CGSC 4910; B.A. – CGSC 4800 and CGSC 4810

FACULTY ASSOCIATED WITH THE PROGRAM IN COGNITIVE SCIENCE

Professors Woo-kyoung Ahn (*Psychology*), Stephen Anderson (*Emeritus*), Amy Arnsten (*School of Medicine*), Richard Aslin (*Haskins Laboratories*), John Bargh (*Psychology*), Paul Bloom (*Emeritus*) (*Psychology*), Hal Blumenfeld (*School of Medicine*), Claire Bowerin (*Linguistics*), Nicolò Cesana-Arlotti (*Psychology*), Marvin Chun (*Psychology*), Veneeta Dayal (*Linguistics*), Michael Della Rocca (*Philosophy*), Ravi Dhar (*School of Management*), Julie Dorsey (*Computer Science*), Melissa Ferguson (*Psychology*), Robert Frank (*Linguistics*), Shane Frederick (*School of Management*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy*), Laurence Horn (*Emeritus*) (*Linguistics*), Marcia Johnson (*Emeritus*), Christine Jolls (*Law School*), Dan Kahan (*Law School*), Frank Keil (*Psychology, Linguistics*), Joshua Knobe (*Philosophy*), Gregory McCarthy (*Psychology*), Nathan Novemsky (*School of Management, Psychology*), Kenneth Pugh (*School of Medicine*), Ian Quinn (*Music*), Holly Rushmeier (*Computer Science*), Laurie Santos (*Psychology*), Brian Scassellati (*Computer Science, Mechanical Engineering*), Brian Scholl (*Chair*) (*Psychology*), Sun-Joo Shin (*Philosophy*), Jason Stanley (*Philosophy*), Zoltán Szabó (*Philosophy*), Nick Turk-Browne (*Psychology*), Tom Tyler (*Law School*), Julie Van Dyke (*Haskins Laboratories*), Fred Volkmar (*School of Medicine*), David Watts (*Anthropology*), Karen Wynn (*Emeritus*) (*Psychology*), Gideon Yaffe (*Law School*), Raffaella Zanuttini (*Linguistics*), Gal Zauberman (*School of Management*), Steven Zucker (*Computer Science, Biomedical Engineering*)

Associate Professors Philip Corlett (*School of Medicine*), Jason Dana (*School of Management*), Yarrow Dunham (*Psychology*), Hedy Kober (*School of Medicine*), James McPartland (*Child Study Center*), Maria Piñango (*Linguistics*)

Assistant Professors Ryan Bennett (*Linguistics*), Steve Chang (*Psychology*), Philip Corlett (*School of Medicine*), Julian Jara-Ettinger (*Psychology*), Julia Leonard (*Psychology*), Samuel McDougale (*Psychology*), Al Powers (*School of Medicine*), Robb Rutledge (*Psychology*), Marynel Vázquez (*Computer Science*), Ilker Yildirim (*Psychology*)

Lecturer Daylian Cain (*School of Management*)