Twin Cities Campus

Cognitive Science Ph.D.

CLA Dean's Office

College of Liberal Arts

Link to a list of faculty for this program.

Contact Information:
Center for Cognitive Sciences, University of Minnesota, 205 Elliott Hall, 75 East River Road, Minneapolis, MN 55455 (612-626-3570; fax: 612-626-7253)
Email: cogsci@umn.edu
Website: http://www.cogsci.umn.edu

- Program Type: Doctorate
- Requirements for this program are current for Fall 2017
- Length of program in credits: 63
- This program does not require summer semesters for timely completion.
- Degree: Doctor of Philosophy

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

Cognitive science is broadly concerned with integrating contemporary approaches to the study of mind/brain, and with the systems and processes underlying the acquisition and use of knowledge. The coherence of the program lies in its intellectual focus on cognition. This program spans cellular, behavioral, and psychological levels of scientific analysis in the study of cognition in a single unified graduate program. It integrates the diverse content, methods, and perspectives of a number of different disciplines (e.g., anthropology, biology, artificial intelligence, linguistics, neuroscience, philosophy, and psychology), which are concerned with or in some sense inform our understanding of cognition. The Ph.D. program trains cognitive scientists to conduct research integrating methodologies and content knowledge from a variety of approaches. In order to ensure an interdisciplinary approach, each student has two co-advisors from the cognitive science graduate faculty, each representing a different discipline from within the cognitive sciences.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

Special Application Requirements:
Applicants must apply through the University's online application system. They must submit a completed application, scores from the GRE, and three letters of recommendation. Applicants wishing to be considered for financial support should apply no later than December 1 of the preceding academic year. Entry is usually in fall semester but may be permitted in other semesters in exceptional cases.

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
  - Paper Based - Total Score: 550
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80

Key to test abbreviations(TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

39 credits are required in the major.

0 credits are required outside the major.
24 thesis credits are required.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

The Ph.D. program requires a minimum of 39 credits, in addition to 24 thesis credits.

Students are required to take two core courses with a CGSC designator,
as well as 3 credits of independent study related to research.

Responsible Conduct of Research training is required and is integrated into the two core courses taken by all students. Other course requirements are distributed among component disciplines and fields. Courses are intended to provide a foundation for the student's research program. Students are expected to conduct two research projects prior to taking their preliminary written exams. A report on the first-year research project should be concluded by the first term of the second year. A report on the second-year research project should be completed by the second term of the third year. The preliminary written exams will typically be (but are not necessarily) expansions of the first- and second-year research projects. The two Ph.D. written preliminary projects are expected to be of near publishable quality. As entry into the Ph.D. program assumes no previous graduate work, students who enter the program with an M.A. or other graduate coursework in a cognitive science-related discipline may apply credits from their previous graduate work towards the required 46 credits.

Introduction to Cognitive Science
CGSC 8000 - Seminar: Philosophy of the Cognitive Sciences (3.0 cr)
or CGSC 8041 - Cognitive Neuroscience (4.0 cr)
or An appropriate substitute approved by the DGS.

Major Electives
Students must take at least 3 credits from each of the 5 disciplines listed below and take a total of at least 30 credits.
Cognitive Psychology
Take 3 or more credit(s) from the following:
- PSY 5014 - Psychology of Human Learning and Memory (3.0 cr)
- PSY 5015 - Cognition, Computation, and Brain (3.0 cr)
- PSY 5062 - Cognitive Neuropsychology (3.0 cr)
- PSY 5064 - Brain and Emotion (3.0 cr)
- PSY 5137 - Introduction to Behavioral Genetics (3.0 cr)
- PSY 8010 - Advanced Topics in Learning (3.0 cr)
- PSY 8031 - Seminar: Visual Perception (2.0 cr)
- PSY 8036 - Topics in Computational Vision (3.0 cr)
- PSY 8055 - Seminar: Cognitive Neuroscience (3.0 cr)
- PSY 8056 - Seminar: Psychology of Language (3.0 cr)
- PSY 8201 - Social Cognition (3.0 cr)
- EPSY 8116 - Reading for Meaning: Cognitive Processes in the Comprehension of Texts (3.0 cr)
- EPSY 8117 - Writing Empirical Paper and Research/Grant Proposals in Education and Psychology (3.0 cr)
- CPSY 8301 - Developmental Psychology: Cognitive Processes (4.0 cr)
- EEB 5322 *{Inactive}*(3.0 cr)

Computer Science
Take 3 or more credit(s) from the following:
- CSCI 5421 - Advanced Algorithms and Data Structures (3.0 cr)
- CSCI 5511 - Artificial Intelligence I (3.0 cr)
- CSCI 5115 - User Interface Design, Implementation and Evaluation (3.0 cr)
- CSCI 5521 - Machine Learning Fundamentals (3.0 cr)
- CSCI 5525 - Machine Learning: Analysis and Methods (3.0 cr)
- CSCI 5561 - Computer Vision (3.0 cr)
- CSCI 8115 - Human-Computer Interaction and User Interface Technology (3.0 cr)
- CSCI 8211 - Advanced Computer Networks and Their Applications (3.0 cr)
- CSCI 8442 - Computational Geometry and Applications (3.0 cr)
- CSCI 8551 - Intelligent Agents (3.0 cr)
- CSCI 8725 - Databases for Bioinformatics (3.0 cr)

Linguistics
Take 3 or more credit(s) from the following:
- LING 5001 - Introduction to Linguistics (4.0 cr)
- LING 5201 - Syntactic Theory I (3.0 cr)
- LING 5202 - Syntactic Theory II (3.0 cr)
- LING 5205 - Semantics (3.0 cr)
- LING 5206 - Linguistic Pragmatics (3.0 cr)

- LING 5801 - Introduction to Computational Linguistics (3.0 cr)
- LING 8200 - Topics in Syntax and Semantics (3.0 cr)
- LING 8210 - Seminar in Syntax (3.0 cr)
- LING 8900 - Seminar: Topics in Linguistics (3.0 cr)
- LING 8921 - Seminar in Language and Cognition (3.0 cr)

Neuroscience

Take 3 or more credit(s) from the following:

- NSC 5202 - Theoretical Neuroscience: Systems and Information Processing (3.0 cr)
- NSC 5461 - Cellular and Molecular Neuroscience (3.0 cr)
- NSC 5561 - Systems Neuroscience (4.0 cr)
- NSC 8217 - Systems and Computational Neuroscience (2.0 cr)

Philosophy

Take 3 or more credit(s) from the following:

- PHIL 4615 *{Inactive}*(3.0 cr)
- PHIL 8131 - Epistemology Survey (3.0 cr)
- PHIL 8180 - Seminar: Philosophy of Language (3.0 cr)
- PHIL 8182 - Formal Semantics of Natural Language (3.0 cr)
- PHIL 8620 - Seminar: Philosophy of the Biological Sciences (3.0 cr)
- PHIL 8670 - Seminar: Philosophy of Science (3.0 cr)