



***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](mailto:cogsci@umn.edu)

Website: <http://www.cogsci.umn.edu>

- Program Type: Doctorate
- Requirements for this program are current for Fall 2019
- Length of program in credits: 60
- 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 PhD 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:**

Applications should be received 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**

36 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.

A minimum GPA of 2.8 is required for students to remain in good standing.

Coursework offered on both the A/F and S/N grade basis must be taken A/F to be applied to major-field requirements.

Students are required to take one core course with a GCSC designator, as well as 3 credits from the research breadth area.

### **Introduction Course (3 credits)**

Select one of the following courses in consultation with the advisor. A substitute course can be applied to this requirement with approval of the director of graduate studies.

[CGSC 8000](#) - Seminar: Philosophy of the Cognitive Sciences (3.0 cr)

or [CGSC 8041](#) - Cognitive Neuroscience (4.0 cr)

### **Electives (30 credits)**

Select at least 3 credits from each of the disciplines below, in consultation with the advisor, for a total of 18 credits. The remaining 12 credits can be from the following list or other coursework as appropriate for the research focus. Advisor approval is required.

#### **Cognitive Psychology (3 credits)**

[CPSY 8301](#) - Developmental Psychology: Cognitive Processes (4.0 cr)

[EPSY 5114](#) - Psychology of Student Learning (3.0 cr)

[EPSY 8112](#) - Mathematical 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)

[EPSY 8118](#) - Advanced Cognitive Psychology (3.0 cr)

[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 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 8042](#) - Proseminar in Cognition, Brain, and Behavior (3.0 cr)

[PSY 8055](#) - Seminar: Cognitive Neuroscience (3.0 cr)

[PSY 8056](#) - Seminar: Psychology of Language (3.0 cr)

#### **Computer Science (3 credits)**

[CSCI 5115](#) - User Interface Design, Implementation and Evaluation (3.0 cr)

[CSCI 5127W](#) - Embodied Computing: Design & Prototyping [WI] (3.0 cr)

[CSCI 5421](#) - Advanced Algorithms and Data Structures (3.0 cr)

[CSCI 5511](#) - Artificial Intelligence I (3.0 cr)

[CSCI 5521](#) - Introduction to Machine Learning (3.0 cr)

[CSCI 5525](#) - Machine Learning (3.0 cr)

[CSCI 5561](#) - Computer Vision (3.0 cr)

[CSCI 5609](#) - Visualization (3.0 cr)

[CSCI 5619](#) - Virtual Reality and 3D Interaction (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 8551](#) - Intelligent Agents (3.0 cr)

[CSCI 8725](#) - Databases for Bioinformatics (3.0 cr)

#### **Linguistics (3 credits)**

Please note LING 8900 may be used depending on the specific topic taken.

[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 (3 credits)**



[NSC 5202](#) - Theoretical Neuroscience: Systems and Information Processing (3.0 cr)

[NSC 5461](#) - Cellular and Molecular Neuroscience (4.0 cr)

[NSC 5561](#) - Systems Neuroscience (4.0 cr)

[NSC 8217](#) - Systems and Computational Neuroscience (2.0 cr)

**Philosophy (3 credits)**

[PHIL 5615](#) - Mind, Bodies and Machines (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)

**Research Breadth (3 credits)**

[CGSC 8410](#) - Perspectives in Learning, Perception, and Cognition (2.0 cr)

[CGSC 8991](#) - Independent Study (1.0 - 4.0 cr)

**Thesis Credits**

Take 24 doctoral thesis credits.

[CGSC 8888](#) - Thesis Credit: Doctoral (1.0 - 24.0 cr)