COGNITIVE SCIENCE, PHD

https://cogsci.jhu.edu/graduate/phd-program/

The Department of Cognitive Science's five-year PhD program has a primary goal to train a new generation of cognitive scientists who can meld multiple existing disciplines into a new, genuinely integrated science of the mind/brain. A secondary goal is to train graduates who are competitive for positions in traditional disciplinary departments at research universities. Because many of the most exciting research developments recognized within the related traditional disciplines arise through interdisciplinary research, the training in cognitive science offered by our department can promote a graduate's attractiveness as a candidate for positions in a variety of departments.

The training we offer in cognitive science is highly interdisciplinary, strongly theoretically oriented, and integrated to an extent only possible within a department of cognitive science. In addition, PhD students are provided extensive experience integrating the theory and methods of diverse cognitive sub-disciplines through specially designed integrative courses and regular seminars involving the entire department.

Our program can offer such a breadth and depth of training because, unlike departments in the allied disciplines, in a department of cognitive science, 100% of graduate training can be focused on cognition. Integrated training across the spectrum of cognitive methods allows students to emerge from graduate school as professional cognitive scientists.

Financial Support/ Funding

Please see the Cognitive Science Graduate Handbook (https://cogsci.jhu.edu/graduate/phd-program/faq/) for more information on departmental funding and benefits for PhD students.

Teaching Assistantships

Teaching experience is regarded as an integral component to the graduate program. Cognitive Science PhD students are expected to teach during their time in the program. More information on teaching experience are available in the Cognitive Science Graduate Handbook. (https://cogsci.jhu.edu/graduate/phd-program/faq/)

Program Requirements

Overview

The Department of Cognitive Science's PhD requirements are designed to meet the goals below.

- **Depth**: Students become expert in their primary area of research interest and are prepared so that they will be competitive for academic positions in one of the traditional disciplines. Students take several advanced courses or participate in seminars/lab meetings that the student, in conjunction with their advisory committee, determines to be important for achieving expertise in a chosen research area and marketplace competitiveness.
  - In the specialized *Computational Cognitive Science Track* the students become expert in the area of CCS and are prepared so that they will be competitive in the job market. Students take several advanced courses or participate in seminars/lab meetings that the student, in conjunction with their advisory committee, determines to be important for achieving expertise in CCS research and marketplace competitiveness.
- **Breadth**: Students develop the ability to understand and critically evaluate work in the various sub-disciplines of cognitive science by completing courses in the areas of cognitive psychology/neuropsychology, computation, linguistics, philosophy, and cognitive neuroscience. Students may place out of breadth courses based on prior equivalent coursework or based on examination.
  - In the specialized *Computational Cognitive Science Track* students develop an understanding of theoretical and experimental approaches to cognitive science that complement and inform computational approaches. Students may place out of breadth courses based on prior equivalent coursework or examination.
- **Integration**: Students learn to integrate theory and method across sub-disciplines through a specially designed integrative course.
- **Research Ethics:** Students complete a research ethics course, which they are encouraged to take in their first year.
- **Professional Development:** Students attend a spring seminar devoted to professional development.
- **Training in Teaching:** Students TA three to five semesters (depending upon external funding). Students are not typically expected to TA in their first semester or in the last two semesters of residency (5th year).
- **Research Papers and Dissertation:** Students produce two research papers prior to completing a dissertation. These papers, which are due November 1st of the second year and May 1st of the third year, draw on two different research methodologies. These two research papers are typically presented at conferences and often lead to separate journal publications.

General PhD Track Requirements

Courses may not be double-counted to fulfill more than one degree requirement. Students are expected to attend the Cognitive Science Colloquium Series and Brown Bag Series in addition to completing course requirements.

The Computational Cognitive Science (CCS) Track (p. 2) within the PhD program in Cognitive Science has requirements that differ somewhat from the program outlined immediately below.

Code	Title	Credits
Breadth		
One breadth course may be audited in consultation with your advisor.		
Cognitive Neuroscience		
One course		
Philosophy		
One course in philosophy of mind, language, or science		
Cognitive Psychology/Neuropsychology		
Two courses in cognitive psychology or neuropsychology. Following are examples of courses that apply:		
AS.200.657	Advanced Statistical Methods (to be completed early in the program, preferably the first semester)	
AS.050.639	Cognitive Development	
AS.050.315	Cognitive Neuropsychology of Visual Perception: The Malfunctioning Visual Brain	
Computation		
AS.050.672	Foundations of Neural Network Theory	

Select one of the following or an approved course on Programming (C++, Java, etc.), or equivalent (e.g. computational linguistics):	
AS.050.671	Bayesian Inference
Linguistics	
AS.050.617	Semantics I
AS.050.620	Syntax I
AS.050.625	Phonology I
AS.050.670	
Integration	
AS.050.626	Foundations of Cognitive Science
Depth: Area of Focus	
Number and scope of courses selected in conjunction with adviser(s) to achieve depth in a chosen research area. Lab meetings may be used to fulfill this requirement.	
Research Ethics	
AS.360.625	Responsible Conduct of Research (encouraged to complete in the first year. In-person RCR required.)
Professional Development	
AS.050.860	Professional Seminar in Cognitive Science (two mini sessions or one semester-long course)
Teaching Assistantships	
AS.050.849	Teaching Practicum (x3-5 semesters, depending upon external funding.)
Two Research Papers	
Dissertation Proposal	
Graduate Board Oral Exam (Dissertation Defense)	

Computational Cognitive Science Track Requirements

Students in this track will obtain a depth of focus in computational coursework, not achieved in the PhD in Cognitive Science general requirements. Accordingly, some of the breadth coursework has been replaced with computational courses, while aiming to retain the spirit of the breadth requirement.

Courses may not be double-counted to fulfill more than one degree requirement. Students are expected to attend the Cognitive Science Colloquium Series and Brown Bag Series in addition to completing course requirements.

Code	Title	Credits
Breadth		
3-4 courses in the Department of Cognitive Science that collectively develop sophistication in theoretical and (human) experimental approaches to cognitive science.		
At least one course must be in each language and vision.		
Basic Computation		
Three courses. Following are examples of courses that apply:		
AS.050.671	Bayesian Inference	
AS.050.672	Foundations of Neural Network Theory	
EN.601.675	Machine Learning	
AS.050.670		
Integration		
AS.050.626	Foundations of Cognitive Science	
Research Ethics		
AS.360.625	Responsible Conduct of Research (encouraged to complete in first year)	
Depth: Area of Focus in Computation CogSci		
6-8 courses selected in conjunction with advisor(s) to achieve depth and expertise in CCS. Lab meetings may be used to fulfill this requirement. Following are examples of courses that apply:		
AS.050.675	Probabilistic Models of the Visual Cortex	
EN.601.665	Natural Language Processing	
EN.601.769	Events Semantics in Theory and Practice	
EN.601.783	Vision as Bayesian Inference	
AS.050.660		
Professional Development		
AS.050.860	Professional Seminar in Cognitive Science (two mini sessions or one semester-long course)	
Teaching Assignments		
AS.050.849	Teaching Practicum (x3-5 semesters depending on external funding.)	
Two Research Papers		
Dissertation Proposal		
Graduate Board Oral Exam (Dissertation Defense)		