Cognitive Neuroscience

Cognitive neuroscience is the study of higher cognitive functions in humans and their underlying neural bases. It is an integrative area of study drawing primarily from cognitive science, psychology, neuroscience, and linguistics. There are two broad directions that can be taken in this concentration - one is behavioral/experimental and the other is computational/modeling. In both, the goal is to understand the nature of cognition from a neural perspective. The standard concentration for the Sc.B. degree requires courses on the foundations, systems level, and integrative aspects of cognitive neuroscience as well as laboratory and elective courses that fit within a particular theme or category such as general cognition, perception, language development or computational/modeling. Concentrators must also complete a senior seminar course or an independent research course. Students may also participate in the work of the Brown Institute for Brain Science, an interdisciplinary program that unites ninety faculty from eleven departments.

Standard Program for the AB degree

These are the new requirements approved by CCC effective Fall 2024. For existing concentrators graduating in 2024-25, the prior requirements can be found by selecting the Bulletin archive **https://bulletin.brown.edu/archive/2023-24/**

Common Core

Careers in Cognitive Neuroscience and related fields requires familiarity with statistics. Therefore, the Cognitive Neuroscience concentration requires a course in Quantitative Methods (CPSY 0900). CPSY 0900 is a prerequisite for most of the laboratory courses, so concentrators should plan to take this course by their fourth semester. The department does not grant concentration credit of AP Statistics, regardless of score. Students who feel that CPSY 0900 is too elementary can complete an approved alternative course (e.g., APMA 1650, CPSY 2906, PHP 1501, ECON 1629, APMA 1660).

Foundation

To provide students with a solid foundation of knowledge in their area of concentration and to minimize redundancy, the Cognitive Neuroscience concentration requires four foundation courses in Neuroscience, Cognitive Neuroscience, Cognitive Neuropsychology, and Computational Methods.

Electives

Each concentrator will take four additional courses that allow the student to go into depth in some of the relevant topics. Three of these courses must be 1000-level courses. Some courses designed to count as electives will often have foundation courses as prerequisites and may include laboratory courses, content courses, or seminars.

Research Methods

Another element in the Cognitive Neuroscience concentration is a research methods course that builds on the introductory statistics course (which will be a prerequisite) but exposes students to a variety of topics in research of the mind: to empirical methods (e.g., surveys, chronometry, eye tracking, brain imaging), to common designs (e.g., factorial experimental, correlational, longitudinal), to research ethics, and to best practices of literature review. Alternatively, students may take an approved laboratory course.

Requirements for the A.B. degree

CPSY 0900	Statistical Methods	1
CPSY 1900	Research Methods And Design	1
or CPSY 1901	Research Methods	
Two Foundation Courses in Cognition from the following:		2
CPSY 0010	Mind, Brain and Behavior: An Interdisciplinary Approach	
CPSY 0100	Learning and Conditioning	
CPSY 0200	Human Cognition	
or CPSY 0400	Cognitive Neuroscience	
or CPSY 0450	Brain Damage and the Mind	
CPSY 0500	Perception and Mind	
CPSY 0550	Science of Consciousness	
CPSY 0610	Children's Thinking: The Nature of Cognitive Development	
or CPSY 0700	Social Psychology	
One Foundation Course in Neuroscience from the following:		1
CPSY 0400	Cognitive Neuroscience	
CPSY 0450	Brain Damage and the Mind	
NEUR 0010	The Brain: An Introduction to Neuroscience	
One Foundation Course in Computation from the following:		1
CPSY 0950	Introduction to programming	
CPSY 1291	Computational Methods for Mind, Brain and Behavior	
CPSY 1492	Computational Cognitive Neuroscience	
CPSY 1950	Deep Learning in Brains, Minds and Machines	
Or any introductory CSCI course with a programming component such as:		
CSCI 0111	Computing Foundations: Data	
or CSCI 0150	Introduction to Object-Oriented Programming and Computer Science	
or CSCI 0170	Computer Science: An Integrated Introduction	
or CSCI 0190	Accelerated Introduction to Computer Science	
Five Approved Electives:		**5**
Five courses from the CPSY, NEUR, or CSCI department, of which three must be at the 1000-level		
Capstone: Independent Study (CPSY 1970, CPSY 1980) or approved seminar		**1**
Total Credits		**12**

Honors Requirement

An acceptable upper level Research Methods, for example CPSY 1900 or an acceptable Laboratory course (see below) will serve as a requirement for admission to the Honors program in Cognitive Neuroscience.

Requirements for the Sc.B. degree

These are the new requirements approved by CCC effective Fall 2024. For existing concentrators graduating in 2024-25, the prior requirements can be found by selecting the Bulletin archive **https://bulletin.brown.edu/archive/2023-24/**

Common Core

Careers in Cognitive Neuroscience and related fields requires familiarity with statistics. Therefore, the Cognitive Neuroscience concentration requires a course in Quantitative Methods (CPSY 0900 (https://bulletin.brown.edu/search/?P=CPSY%200900)). CPSY 0900 (https://bulletin.brown.edu/search/?P=CPSY%200900) is a prerequisite for most of the laboratory courses, so concentrators should plan to take this course by their fourth semester. The department does not grant concentration credit of AP Statistics, regardless of score. Students who feel that CPSY 0900 (https://bulletin.brown.edu/search/?P=CPSY%200900) is too elementary can complete an approved alternative course (e.g., APMA 1650 (https://bulletin.brown.edu/search/?P=APMA%201650), CPSY 2906 (https://bulletin.brown.edu/search/?P=CPSY%202906), PHP 1501 (https://bulletin.brown.edu/search/?P=PHP%201501), ECON 1629 (https://bulletin.brown.edu/search/?P=ECON%201629), APMA 1660 (https://bulletin.brown.edu/search/?P=APMA%201660)).

Foundation

To provide students with a solid foundation of knowledge in their area of concentration and to minimize redundancy, the Cognitive Neuroscience

concentration requires four foundation courses in Neuroscience, Cognitive Neuroscience, Cognitive Neuropsychology, and Computational Methods.

Electives

Each concentrator will take four additional courses that allow the student to go into depth in some of the relevant topics. Three of these courses must be 1000-level courses. Some courses designed to count as electives will often have foundation courses as prerequisites and may include laboratory courses, content courses, or seminars.

Research Methods

Another element in the Cognitive Neuroscience concentration is a research methods course that builds on the introductory statistics course (which will be a prerequisite) but exposes students to a variety of topics in research of the mind: to empirical methods (e.g., surveys, chronometry, eye tracking, brain imaging), to common designs (e.g., factorial experimental, correlational, longitudinal), to research ethics, and to best practices of literature review. Alternatively, students may take an approved laboratory course.

Requirements for Sc.B.

In line with university expectations, the Sc.B. requirements include a greater number of courses and especially science courses. The definition of "science" is flexible. A good number of these courses will be outside of CLPS, but several CLPS courses might fit into a coherent package as well. In addition, the Sc.B. degree also requires a lab course to provide these students with in-depth exposure to research methods in a particular area of the science of the mind.

CPSY 0900	Statistical Methods	1
CPSY 1900	Research Methods And Design	1
or CPSY 1901	Research Methods	
Two Foundation Courses in Cognition from the following:		2
CPSY 0010	Mind, Brain and Behavior: An Interdisciplinary Approach	
CPSY 0100	Learning and Conditioning	
CPSY 0200	Human Cognition	
or CPSY 0400	Cognitive Neuroscience	
or CPSY 0450	Brain Damage and the Mind	
CPSY 0500	Perception and Mind	
CPSY 0550	Science of Consciousness	
CPSY 0610	Children's Thinking: The Nature of Cognitive Development	
or CPSY 0700	Social Psychology	
One Foundation Course in Neuroscience from the following:		1
CPSY 0400	Cognitive Neuroscience	
CPSY 0450	Brain Damage and the Mind	
NEUR 0010	The Brain: An Introduction to Neuroscience	
One Foundation Course in Computation from the following:		1
CPSY 0950	Introduction to programming	
CPSY 1291	Computational Methods for Mind, Brain and Behavior	
CPSY 1492	Computational Cognitive Neuroscience	
CPSY 1950	Deep Learning in Brains, Minds and Machines	
Or any introductory CSCI course with a programming component such as:		
CSCI 0111	Computing Foundations: Data	
or CSCI 0150	Introduction to Object-Oriented Programming and Computer Science	
or CSCI 0170	Computer Science: An Integrated Introduction	
or CSCI 0190	Accelerated Introduction to Computer Science	
Five Approved Electives:		5
Five courses from the CPSY, NEUR, or CSCI department, of which three must be at the 1000-level		
Five additional STEM courses of which two (2) must be CPSY courses at the 1000-level from the Electives of Capstone offerings (a lab is strongly recommended). Courses from APMA, BIOL, CSCI, CHEM, CPSY, MATH, NEUR, or PHYS will be considered and must be applicable to a concentration in that department.		5
Capstone: Independent Study (CPSY 1970, CPSY 1980) or approved seminar		1
Total Credits		**17**

Honors Requirement

An acceptable upper level Research Methods, for example CPSY 1900 or an acceptable Laboratory course (see below) will serve as a requirement for admission to the Honors program in Cognitive Neuroscience.