School of Arts and Sciences

Department of Psychology

BA/BS in Cognitive and Brain Science

Cognitive and Brain Science (CBS) is an inherently interdisciplinary area, drawing on psychology, neuroscience, linguistics, philosophy of mind, computer science, and biology. A Cognitive and Brain Science degree provides an excellent preparation for careers in the sciences, computer fields, health professions, law, and education.

Students majoring in Cognitive and Brain Science usually receive a Bachelor of Science degree.

Learning Objectives

Program Requirements and Policies

- A total of thirteen courses are required for the CBS major. Unless specified otherwise, courses counted towards the major must be at least three (3) semester-hour credits.
- Students scoring 4 or 5 on the Psychology AP exam, 6 or 7 on the International Baccalaureate (Higher Level) exam, or A or B on the GCE A-level exam earn credit for PSY 1. In other words, the student earns 3 semester-hour credits and does not need to take PSY 1 for the major. Students may substitute Child Study and Human Development 1 for PSY 1 for prerequisite purposes, but they must take an additional psychology course in order to reach the 13 courses required for the major.
- In addition to the required courses, Cognitive and Brain Science majors are encouraged to complete a senior research project which entails either (a) completing an honors thesis in Psychology, Child Study and Human Development, Computer Science, or Philosophy; (b) completing a year-long research experience with a faculty member in one of these departments or with a faculty member in the Neuroscience Department of the Medical School; or (c) completing a faculty-supervised review paper of the literature on a particular issue within one of these areas. Planning for such projects should begin by the end of junior year.

- Please note that Computer Science 11 has prerequisites that must be satisfied before enrolling.
- Students are encouraged, after consultation with their advisor, to augment the Cognitive and Brain Science major by taking electives in Psychology, Anthropology (150), Biology (13, 14, 116, 134), and Math (11, 12, 13, 121).
- Please note that CBS majors with an advisor from a department other than Psychology should follow that department's policies for completing the senior degree sheet paperwork. The second signature on that degree sheet will come from a representative of that department, not from Psychology.

Course Requirements

Part I

The following seven required courses:

- Psychology 1: Introduction to Psychology
- Psychology 9: Introduction to Cognitive and Brain Sciences
- Psychology 31: Statistics for the Behavioral Sciences (or one of: BIO 132, CEE 6/CH 36, CEE 156, CSHD 140)
- Psychology 32: Experimental Psychology
- Psychology 64 (cross listed as Philosophy 15/Linguistics 15): Introduction to Linguistics
- Computer Science 11: Introduction to Computer Science
- Psychology 195: Senior Seminar in Cognitive & Brain Science (Please note: PSY 195 meets in the fall semester only)

Note: The CBS steering committee strongly recommends that CBS majors, especially those seeking a greater emphasis in the computation side of Cognitive Science, also take Computer Science 15 and Computer Science/Math 61 as many (but not all) upper level Computer Science courses require these courses as prerequisites.

Part II

One course from each of the following three groups:

GROUP A

Psychology 11: Developmental Psychology

Psychology 25: Physiological Psychology

Psychology 26: Animal Learning and Cognition

Psychology 27: Perception

Psychology 28: Cognitive Psychology

Psychology 29: Human Neuropsychology

Psychology 103: Brain & Behavior

CSHD 51/151: Intellectual Development

GROUP B

Computer Science 15: Data Structures

Computer Science 131: Artificial Intelligence

Computer Science 133: Human-Robot Interaction

Computer Science 134: Computational Models in Cognitive Science

Computer Science 138: Reinforcement Learning

Computer Science 139: Ethics for AI Robotics

Computer Science 150AA: Assistive Algorithms

Computer Science 150DR: Developmental Robotics

Computer Science 150NLP: Natural Language Processing

Computer Science 171: Human Computer Interaction

Classics 161: Intro to Digital Humanities

Classics 162: Natural Language Processing and the Human Record

GROUP C

Philosophy 3: Language and Mind

Philosophy 33 or 103: Logic

Philosophy 191-02: Foundations of Cognitive Science

Psychology 150: Semantics

Psychology 151: Syntactic Theory

Psychology 155: Phonological Theory

Part III

A total of three courses taken from at least two of the following groups (only one of which may be independent study/directed research; also note that courses used to fulfill Part II. requirements above may not be double counted toward Part III. as well):

GROUP A
Psychology 80: Psychology of Music
Psychology 91/92: Research in Psychology
Psychology 103: Brain and Behavior
Psychology 112: Biological Basis of Psychopathology
Psychology 116: Psychology of Fear
Psychology 117: Autism and Neurodevelopmental Disorders
Psychology 118: Topics in Infancy
Psychology 121: Applying Cognition to Education
Psychology 122: Cognitive Aging
Psychology 123: Psychopharmacology
Psychology 124: Cognition of Games People Play
Psychology 126: Origins of Cognition
Psychology 127: Behavioral Endocrinology
Psychology 128: Nutrition and Behavior
Psychology 129: Cognitive Neuroscience
Psychology 131: Neuropsychology of Cognition
Psychology 139: Social Cognition
Psychology 140: Probabilistic Models of Perception and Cognition
Psychology 142: Seminar in Affective Neuroscience
Psychology 144: Memory and Retention
Psychology 145: Mental Representation
Psychology 146: Comparative Cognition and Behavior
Psychology 147: Multitasking
Psychology 153: Cognitive Neuroscience of Language Processing
Psychology 154: Psychosis
Psychology 156: Long Term Memory Processes

Psychology 157: Multisensory Perception

Psychology 191/192: Independent Research in Psychology

Psychology 199: Senior Honors Thesis

Biology 134: Neurobiology

GROUP B

Psychology 149: Psychology of Language

Psychology 150: Semantics

Psychology 151: Syntactic Theory

Psychology 152: The Psychology of Bilingualism

Psychology 153: Biological Foundations of Language

Psychology 155: Phonological Theory (if not taken to fulfill II. C above)

Psychology 180: Music, Language, and the Brain

CSHD 114: Children and New Technologies

CSHD 145: Technological Tools for Thinking and Learning

CSHD 51/151: Intellectual Development

CSHD 152: Development of Thought and Language

CSHD 155: The Young Child's Development of Language

CSHD 156: Developmental Neuroscience and Disorders of Development

CSHD 177: Bilingual Studies

CSHD 195: Developmental Disorders in Language and Reading

CSHD 250: Reading, Dyslexia, and the Brain

Education 114 (cross-listed as Linguistics/German 114): Linguistic Approaches to Second Language Acquisition

GROUP C

Computer Science 86: Object Oriented Programming for Graphical User Interfaces

Computer Science 93: Directed Study

Computer Science 94: Directed Study

Computer Science 105: Programming Languages

Computer Science 131: Artificial Intelligence

Computer Science 133: Human-Robot Interaction

Computer Science 134: Computational Models in Cognitive Science

Computer Science 135: Machine Learning and Data Mining
Computer Science 138: Reinforcement Learning
Computer Science 139: Ethics for AI Robotics
Computer Science 150AA: Assistive Algorithms
Computer Science 150AAC: Accessible and Assistive Computing
Computer Science 150DR: Developmental Robotics
Computer Science 150NLP: Natural Language Processing
Computer Science 170: Computation Theory
Computer Science 171: Human Computer Interaction
Computer Science 177: Visualization
Computer Science 178: Visual Analytics
Computer Science 193: Directed Study
Computer Science 194: Directed Study
Classics 161: Intro to Digital Humanities
Classics 162: Natural Language Processing and the Human Record

GROUP D
Philosophy 38: Rational Choice
Philosophy 114: Topics in Logic
Philosophy 116: Philosophy of Science
Philosophy 117: Philosophy of Mind
Philosophy 118: Philosophy Of Biology
Philosophy 126: Theories of Human Nature
Philosophy 130: Moral Philosophy
Philosophy/Psychology/Anthropology 132: Cognition of Society and Culture
Philosophy 133: Philosophy of Language
Philosophy 134: Philosophy of Social Science
Philosophy 170: Computation Theory
Philosophy 191-02: Foundations of Cognitive Science

Minor in Cognitive & Brain Science or Linguistics

A minor in Cognitive & Brain Science is also available and administered by the Department of Philosophy. For questions, please contact Jaouad Elkamouss or

Professor Brian Epstein.

A minor in Linguistics is also available and administered by the Department of Philosophy. For questions, please contact Jaouad Elkamouss or the Co-Directors of the minor, Professor Dilip Ninan and Professor Ariel Goldberg.

Any full-time faculty member in the Department of Psychology can advise CBS majors. In addition, full-time faculty members in Computer Science (e.g., Remco Chang, Rob Jacob) or Philosophy (e.g., Stephen White, Brian Epstein) can advise CBS majors.