DEPARTMENT OF BRAIN AND COGNITIVE SCIENCES

Undergraduate Study

Bachelor of Science in Brain and Cognitive Sciences (Course 9)

Brain science and cognitive science are complementary and interactive in their research objectives. Both approaches examine perception, performance, and intervening processes in humans and animals. Central issues in the discipline include the interpretation of sensory experience; the reception, manipulation, storage, and retrieval of information within the nervous system; and the planning and execution of motor activity. Higher-level functions include the development of formal and informal reasoning skills; and the structure, acquisition, use, and internal representation of human language.

The Bachelor of Science in Brain and Cognitive Sciences (*http://catalog.mit.edu/degree-charts/brain-cognitive-sciences-course-9*) prepares students to pursue advanced degrees or careers in artificial intelligence, machine learning, neuroscience, medicine, cognitive science, psychology, linguistics, philosophy, education research and technology, and human-machine interaction.

Methods of inquiry in the brain and cognitive sciences are drawn from molecular, cellular, and systems neuroscience; cognitive and perceptual psychology; computer science and artificial intelligence; linguistics; philosophy of language and mind; and mathematics. The undergraduate program is designed to provide instruction in the relevant aspects of these various disciplines. The program is administered by an Undergraduate Officer and an Undergraduate Administrator, consulting as necessary with faculty members from these disciplines who also serve as advisors to majors, helping them select a coherent set of subjects from within the requirements, including a research requirement. Members of the faculty are available to guide the research.

The Brain and Cognitive Sciences (BCS) major incorporates programming and computational skills to meet the increasing demands for those skills in both graduate school and the workforce. The major offers a tiered system of subjects with enough flexibility to allow multiple avenues through the Brain and Cognitive Sciences curriculum, meeting the divergent goals of BCS students. Individual guidance regarding career goals is available from faculty and from Career Advising and Professional Development.

Bachelor of Science in Computation and Cognition (Course 6-9)

The Department of Electrical Engineering and Computer Science (*http://catalog.mit.edu/schools/engineering/electrical-engineering-computer-science*) and the Department of Brain and Cognitive Sciences (p. 3) offer a joint curriculum leading to a Bachelor of Science in Computation and Cognition (*http://catalog.mit.edu/degree-charts/computation-cognition-6-9*) that focuses on the emerging field of computational and engineering approaches to brain science, cognition, and machine intelligence. The curriculum provides flexibility to accommodate students with a wide diversity of interests in this area—from biologically inspired approaches to artificial intelligence to reverse engineering circuits in the brain. This joint program prepares students for careers that include advanced applications of artificial intelligence and machine learning, as well as further graduate study in systems and cognitive neuroscience. Students in the program are full members of both departments, with an academic advisor from the Department of Brain and Cognitive Sciences.

Inquiries

Information about this program is available from the Brain and Cognitive Sciences Academic Office, Room 46-2005, 617-253-7403.

Minor in Brain and Cognitive Sciences

The Minor in Brain and Cognitive Sciences consists of six subjects arranged in two levels of study, intended to provide students breadth in the field as a whole and some depth in an area of specialization.

Core Subjects		
9.00	Introduction to Psychological Science	12
9.01	Introduction to Neuroscience	12
9.40	Introduction to Neural Computation	12
Specialized Subjects		
Select any combination of three subjects from Tier 2 and/or Tier 3 of the undergraduate degree program:		36
Tier 2 Subjects		
9.09[J]	Cellular and Molecular Neurobiology	
9.13	The Human Brain	
9.18[J]	Developmental Neurobiology	
9.19	Computational Psycholinguistics	
9.21[J]	Cellular Neurophysiology and Computing	
9.26[J]	Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience	
9.35	Perception	
9.49	Neural Circuits for Cognition	
9.53	Emergent Computations Within Distributed Neural Circuits	
9.66[J]	Computational Cognitive Science	
9.85	Infant and Early Childhood Cognition	
Tier 3 Subjects		
9.24	Disorders and Diseases of the Nervous System	
9.28	Current Topics in Developmental Neurobiology	
9.32	Genes, Circuits, and Behavior	

| **Total Units** | **72** |