COMPUTATION AND COGNITION (COURSE 6-9)

Computation and Cognition (*https://catalog.mit.edu/ interdisciplinary/undergraduate-programs/degrees/computation-cognition*)

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

General Institute Requirements (GIRs)

The General Institute Requirements include a Communication Requirement that is integrated into both the HASS Requirement and the requirements of each major; see details below.

Summary of Subject Requirements	Subjects
Science Requirement	6
Humanities, Arts, and Social Sciences (HASS) Requirement [9.85 can be satisfied in the Departmental Program]; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.	8
Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 9.01 and 6.1200[J], 6.2000, 6.3000, 6.3700, 18.03, 18.05, 18.06, 18.600, 18.C06[J] in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by a laboratory in the Departmental Program]	1
Total GIR Subjects Required for SB Degree	**17**

Physical Education Requirement
Swimming requirement, plus four physical education courses for eight points.

Departmental Program

Choose at least two subjects in the major that are designated as communication-intensive (CI-M) to fulfill the Communication Requirement.

Required Subjects		Units
6.100A	Introduction to Computer Science Programming in Python	6
9.01	Introduction to Neuroscience	12
18.06	Linear Algebra	12
or 18.C06[J]	Linear Algebra and Optimization	
Select one of the following:		6-12
6.1200[J]	Mathematics for Computer Science	
6.120A	Discrete Mathematics and Proof for Computer Science	
18.03	Differential Equations	

Select one of the following:		12
6.3700	Introduction to Probability	
18.05	Introduction to Probability and Statistics	
18.600	Probability and Random Variables	
6.3800	Introduction to Inference	
9.07	Statistics for Brain and Cognitive Science [1]	

EECS Program Subjects		
6.3900	Introduction to Machine Learning	12
Select two of the following:		24
6.1010	Fundamentals of Programming	
6.1210	Introduction to Algorithms	
6.2000	Electrical Circuits: Modeling and Design of Physical Systems	
Select one of the following:		12
6.3000	Signal Processing	
6.3100	Dynamical System Modeling and Control Design	
6.4110	Representation, Inference, and Reasoning in AI	

BCS Program Subjects [1]

Brain Systems/Neurophysiology		
Select one of the following:		12
9.09[J]	Cellular and Molecular Neurobiology [1]	
9.13	The Human Brain [1]	
9.18[J]	Developmental Neurobiology [1]	
9.21[J]	Cellular Neurophysiology and Computing [1]	
9.35	Perception [1]	
9.36	Neurobiology of Self [1]	
9.40	Introduction to Neural Computation [1]	
9.67[J]	Materials Physics of Neural Interfaces (CI-M)	

Computation and Cognition		
Select one of the following:		12
9.19	Computational Psycholinguistics [1]	
9.39	Language in the Mind and Brain	
9.49	Neural Circuits for Cognition [1]	
9.53	Emergent Computations Within Distributed Neural Circuits [1]	
9.66[J]	Computational Cognitive Science [1]	
9.85	Infant and Early Childhood Cognition (CI-M) [1]	

Program Electives		
One subject from the Electives list		12-18

Laboratory		
One subject from the Laboratory Subjects list		12
Advanced Project		
Select one of the following:		6-18
6.UAR	Seminar in Undergraduate Advanced Research (CI-M)	
9.41	Research and Communication in Neuroscience and Cognitive Science (CI-M)	
9.58	Projects in the Science of Intelligence (CI-M)	
6.4200[J]	Robotics: Science and Systems (CI-M)	
6.4210	Robotic Manipulation (CI-M)	
6.8301	Advances in Computer Vision (CI-M)	
6.8611	Quantitative Methods for Natural Language Processing (CI-M)	
Units in Major		**150-174**
Unrestricted Electives [3]		**48-72**
Units in Major That Also Satisfy the GIRs		(36-48)
Total Units Beyond the GIRs Required for SB Degree		**180-198**

The units for any subject that counts as one of the 17 GIR subjects cannot also be counted as units required beyond the GIRs.

[1]   *Subjects that also appear in the list of BCS Program Subjects can count as either a BCS Program Subject or a Program Elective, but not both.*

[2]   *Subject has prerequisites that are outside of the program.*

[3]   *In order to meet the 180-198 units beyond the GIRs required, students may need to take more than 48 or fewer than 72 units of unrestricted electives.*

Program Electives

6.4100	Artificial Intelligence	12
6.4200[J]	Robotics: Science and Systems	12
6.8301	Advances in Computer Vision	15
6.8611	Quantitative Methods for Natural Language Processing	15
9.09[J]	Cellular and Molecular Neurobiology [1]	12
9.13	The Human Brain [1]	12
9.18[J]	Developmental Neurobiology [1]	12
9.19	Computational Psycholinguistics [1]	12
9.21[J]	Cellular Neurophysiology and Computing [1][2]	12
9.24	Disorders and Diseases of the Nervous System	12
9.26[J]	Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience	12
9.35	Perception [1]	12
9.36	Neurobiology of Self [1]	12
9.40	Introduction to Neural Computation [1]	12
9.42	The Brain and Its Interface with the Body	12
9.49	Neural Circuits for Cognition [1]	12
9.53	Emergent Computations Within Distributed Neural Circuits [1]	12
9.66[J]	Computational Cognitive Science [1]	12
9.85	Infant and Early Childhood Cognition [1]	12
6.3800	Introduction to Inference	12
9.60	Machine-Motivated Human Vision	12
2.74	Bio-inspired Robotics	12
9.39	Language in the Mind and Brain	12
6.1040	Software Design	18
16.84	Advanced Autonomous Robotic Systems	12
6.C25[J]	Real World Computation with Julia	12
6.4210	Robotic Manipulation	15
6.1120	Dynamic Computer Language Engineering	12

Laboratory Subjects

6.2040	Analog Electronics Laboratory (CI-M)	12
6.2050	Digital Systems Laboratory (CI-M) [2]	12
6.2060	Microcomputer Project Laboratory (CI-M) [2]	12
6.2370	Modern Optics Project Laboratory (CI-M)	12
6.4200[J]	Robotics: Science and Systems (CI-M)	12
6.4880[J]	Biological Circuit Engineering Laboratory (CI-M)	12
9.17	Systems Neuroscience Laboratory (CI-M) [1]	12
9.59[J]	Laboratory in Psycholinguistics (CI-M) [1]	12
9.60	Machine-Motivated Human Vision (CI-M) [1]	12

[1]   *Subjects that also appear in the list of BCS Program Subjects can count as either a BCS Program Subject or a Program Elective, but not both.*

[2]   *Subject has prerequisites that are outside of the program.*