Computer Science and Molecular Biology (Course 6-7)

Computer Science and Molecular Biology

Bachelor of Science in Computer Science and Molecular Biology

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; 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 5.12 and 6.042[J] in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 6.129[J], 7.003, or 20.109 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
Mathematics and Introductory		
6.0001 & 6.0002	Introduction to Computer Science Programming in Python and Introduction to Computational Thinking and Data Science [1]	12
6.042[J]	Mathematics for Computer Science	12
Chemistry		
5.12	Organic Chemistry I	12
Select one of the following:		12
5.601 & 5.602	Thermodynamics I and Thermodynamics II and Kinetics	
20.110[J]	Thermodynamics of Biomolecular Systems	
Introductory Laboratory		
Select one of the following:		15-18
6.129[J]	Biological Circuit Engineering Laboratory (CI-M)	

7.002 & 7.003	Fundamentals of Experimental Molecular Biology and Molecular Biology Laboratory (CI-M)	
20.109	Laboratory Fundamentals in Biological Engineering (CI-M)	

Foundational Subjects

Three Computer Science subjects:

6.006	Introduction to Algorithms	12
6.009	Fundamentals of Programming	12
6.046[J]	Design and Analysis of Algorithms	12

Three Biological Science subjects:

7.03	Genetics	12
7.05	General Biochemistry [2]	12
7.06	Cell Biology	12

Restricted Electives

Computational Biology

Select one of the following: 12

6.047	Computational Biology: Genomes, Networks, Evolution	
6.802[J]	Computational Systems Biology: Deep Learning in the Life Sciences	
7.09	Quantitative and Computational Biology [3]	
7.33[J]	Evolutionary Biology: Concepts, Models and Computation [3]	

Biology

Select one subject from the list of Biology Restricted Electives	12

Advanced Undergraduate Project

Select one of the following: 9-12

6.UAR	Seminar in Undergraduate Advanced Research (12 units, CI-M)	
6.UAT	Oral Communication (CI-M)	
7.19	Communication in Experimental Biology (CI-M)	

Units in Major	168-174
Unrestricted Electives	48
Units in Major That Also Satisfy the GIRs	(36)
Total Units Beyond the GIRs Required for SB Degree	180-186

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] *Students who enter MIT with sufficient programming experience may substitute 6.031 Elements of Software Construction (15 units) after taking 6.009.*

[2] *5.07[J] Biological Chemistry I is also an acceptable option.*

[3] *These subjects can count towards either the Computational Biology or the Biology restricted electives, but not both.*

Biology Restricted Electives

7.08[J]	Biological Chemistry II	12
7.09	Quantitative and Computational Biology	12
7.20[J]	Human Physiology	12
7.21	Microbial Physiology	12
7.23[J]	Immunology	12
7.26	Molecular Basis of Infectious Disease	12
7.27	Principles of Human Disease	12
7.28	Molecular Biology	12
7.29[J]	Cellular and Molecular Neurobiology	12
7.30[J]	Fundamentals of Ecology	12
7.31	Current Topics in Mammalian Biology: Medical Implications	12
7.32	Systems Biology	12
7.33[J]	Evolutionary Biology: Concepts, Models and Computation [1]	12
7.37[J]	Molecular and Engineering Aspects of Biotechnology	12
7.371	Biological and Engineering Principles Underlying Novel Biotherapeutics	12
7.45	The Hallmarks of Cancer	12
7.46	Building with Cells	12
7.49[J]	Developmental Neurobiology	12

[1] *These subjects can count towards either the Computational Biology or the Biology restricted electives, but not both.*