

COMPUTER SCIENCE AND MOLECULAR BIOLOGY (COURSE 6-7)

Computer Science and Molecular Biology (<http://catalog.mit.edu/interdisciplinary/undergraduate-programs/degrees/computer-science-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 6.1200[]] in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 6.4880[], 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	
6.100A Introduction to Computer Science & 6.100B Programming in Python and Introduction to Computational Thinking and Data Science ¹	12
6.1200[] Mathematics for Computer Science	12
Chemistry	
5.12 Organic Chemistry I	12
<i>Select one of the following:</i>	
5.601 Thermodynamics I & 5.602 and Thermodynamics II and Kinetics	12

20.110[] Thermodynamics of Biomolecular Systems

Introductory Laboratory

Select one of the following: 15-18

6.4880[] Biological Circuit Engineering Laboratory (CI-M)

7.002 Fundamentals of Experimental & 7.003[] Molecular Biology and Applied Molecular Biology Laboratory (CI-M)

20.109 Laboratory Fundamentals in Biological Engineering (CI-M)

Foundational Subjects

Three Computer Science subjects:

6.1010 Fundamentals of Programming 12

6.1210 Introduction to Algorithms 12

6.1220[] 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

6.8701 Computational Biology: Genomes, Networks, Evolution

6.8711[] Computational Systems Biology: Deep Learning in the Life Sciences

7.093 Modern Biostatistics & 7.094 and Modern Computational Biology ³

7.33[] 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 6.1020 Software Construction (15 units) after taking 6.1010.
- ² 5.07[J] Introduction to Biological Chemistry 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]	Fundamentals of Chemical Biology	12
7.093 & 7.094	Modern Biostatistics and Modern Computational Biology ¹	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 and Aging	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.