

## 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 6.042[[]] in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 6.129[[]], 7.003[[]], or 20.109 in the Departmental Program]	1
<b>Total GIR Subjects Required for SB Degree</b>	<b>17</b>

#### 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
<b>Mathematics and Introductory</b>	
6.0001 Introduction to Computer Science & 6.0002 Programming in Python and Introduction to Computational Thinking and Data Science <sup>1</sup>	12
6.042[[]] Mathematics for Computer Science	12
<b>Chemistry</b>	
5.12 Organic Chemistry I	12
<i>Select one of the following:</i>	12
5.601 Thermodynamics I & 5.602 and Thermodynamics II and Kinetics	

20.110[[]] Thermodynamics of Biomolecular Systems

#### Introductory Laboratory

*Select one of the following:* 15-18

6.129[[]] 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:*

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

*Three Biological Science subjects:*

7.03 Genetics	12
7.05 General Biochemistry <sup>2</sup>	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[[]] Computational Systems Biology: Deep Learning in the Life Sciences	
7.093 Modern Biostatistics & 7.094 and Modern Computational Biology <sup>3</sup>	
7.33[[]] Evolutionary Biology: Concepts, Models and Computation <sup>3</sup>	

#### 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.

- <sup>1</sup> Students who enter MIT with sufficient programming experience may substitute 6.031 Elements of Software Construction (15 units) after taking 6.009.
- <sup>2</sup> 5.07[ ] Introduction to Biological Chemistry is also an acceptable option.
- <sup>3</sup> These subjects can count towards either the Computational Biology or the Biology restricted electives, but not both.

### **Biology Restricted Electives**

7.08[ ]	Fundamentals of Chemical Biology	12
7.093 & 7.094	Modern Biostatistics and Modern Computational Biology <sup>1</sup>	12
7.20[ ]	Human Physiology	12
7.21	Microbial Physiology	12
7.23[ ]	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[ ]	Cellular and Molecular Neurobiology	12
7.30[ ]	Fundamentals of Ecology	12
7.31	Current Topics in Mammalian Biology: Medical Implications	12
7.32	Systems Biology	12
7.33[ ]	Evolutionary Biology: Concepts, Models and Computation <sup>1</sup>	12
7.37[ ]	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[ ]	Developmental Neurobiology	12

- <sup>1</sup> These subjects can count towards either the Computational Biology or the Biology restricted electives, but not both.