CHEMISTRY AND BIOLOGY (COURSE 5-7)

Chemistry and Biology (*https://catalog.mit.edu/interdisciplinary/ undergraduate-programs/degrees/chemistry-biology*)

Bachelor of Science in Chemistry and 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 7.03 in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 7.003[J] or the combination of 5.351, 5.352, and 5.353 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
5.03	Principles of Inorganic Chemistry I	12
5.07[J]	Introduction to Biological Chemistry	12
or 7.05	General Biochemistry	
5.08[J]	Fundamentals of Chemical Biology	12
5.12	Organic Chemistry I	12
5.13	Organic Chemistry II	12
5.601	Thermodynamics I	6
5.611	Introduction to Spectroscopy	6
7.03	Genetics	12
7.06	Cell Biology	12
Departmental Laboratory Requirement		
5.351	Fundamentals of Spectroscopy	4

5.352	Synthesis of Coordination Compounds and Kinetics (CI-M)	5
5.353	Macromolecular Prodrugs	4
7.002	Fundamentals of Experimental Molecular Biology	6
Select one of the following options:		9-12
Option 1		
5.361	Recombinant DNA Technology	
5.362	Cancer Drug Efficacy (CI-M)	
Option 2		
7.003[J]	Applied Molecular Biology Laboratory (CI-M)	

Restricted Electives

Select 30 units of the following:		30
5.04	Principles of Inorganic Chemistry II	
5.363	Organic Structure Determination	
5.371	Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel	
5.372	Chemistry of Renewable Energy	
5.373	Synthesis of Boron Heterocycles	
5.381	Quantum Dots	
5.382	Time- and Frequency-resolved Spectroscopy of Photosynthesis	
5.383	Fast-flow Peptide and Protein Synthesis	
5.39	Research and Communication in Chemistry	
5.43	Advanced Organic Chemistry	
5.602	Thermodynamics II and Kinetics	
5.612	Electronic Structure of Molecules	
5.62	Physical Chemistry	
7.093	Modern Biostatistics	
7.094	Modern Computational Biology	
7.19	Communication in Experimental Biology (CI-M)	
7.20[J]	Human Physiology	
7.21	Microbial Physiology	
7.23[J]	Immunology	
7.24	Advanced Concepts in Immunology	
7.26	Molecular Basis of Infectious Disease	
7.27	Principles of Human Disease and Aging	
7.28	Molecular Biology	
7.29[J]	Cellular and Molecular Neurobiology	
7.30[J]	Fundamentals of Ecology	
7.31	Current Topics in Mammalian Biology: Medical Implications	

7.32	Systems Biology [1]
7.33[J]	Evolutionary Biology: Concepts, Models and Computation
7.35	Human Genetics and Genomics
7.371	Biological and Engineering Principles Underlying Novel Biotherapeutics
7.45	The Hallmarks of Cancer
7.46	Building with Cells
7.49[J]	Developmental Neurobiology
6.C01 & 7.C01	Modeling with Machine Learning: from Algorithms to Applications and Machine Learning in Molecular and Cellular Biology [1,2]
9.17	Systems Neuroscience Laboratory [1]
9.26[J]	Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience

Units in Major	**154-157**
Unrestricted Electives	**59-62**
Units in Major That Also Satisfy the GIRs	(36)
Total Units Beyond the GIRs Required for SB Degree	**180**

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

[2]   *Students must complete 6.C01 & 7.C01 simultaneously in order to receive credit.*