

Chemistry and Biology (Course 5-7)

Chemistry and 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 or 5.60 and 7.03 in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 7.02[J] or the combination of 5.351, 5.352, and 5.363 or 7.102 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
5.12 Organic Chemistry I	12
5.13 Organic Chemistry II	12
5.60 Thermodynamics and Kinetics	12
7.03 Genetics	12
7.06 Cell Biology	12
5.07[J] Biological Chemistry I or 7.05 General Biochemistry	12
Restricted Electives	
<i>Select two of the following:</i>	24
5.04 Principles of Inorganic Chemistry II	

5.08[J]	Biological Chemistry II
5.43	Advanced Organic Chemistry
5.61	Physical Chemistry
5.62	Physical Chemistry
7.09	Quantitative and Computational Biology
7.20[J]	Human Physiology
7.21	Microbial Physiology
7.22	Developmental Biology
7.23[J]	Immunology
7.26	Molecular Basis of Infectious Disease
7.27	Principles of Human Disease
7.28	Molecular Biology
7.29[J]	Cellular and Molecular Neurobiology
7.30A[J] & 7.30B[J]	Fundamentals of Ecology I and Fundamentals of Ecology II
7.31	Current Topics in Mammalian Biology: Medical Implications
7.32	Systems Biology ¹
7.33[J]	Evolutionary Biology: Concepts, Models and Computation
7.371	Biological and Engineering Principles Underlying Novel Biotherapeutics
7.41	Principles of Chemical Biology
7.45	The Hallmarks of Cancer
7.49[J]	Developmental Neurobiology

Departmental Laboratory Requirement

Select 49-61 units from one of the three departmental laboratory tracks	49-61
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Units in Major	157-169
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Unrestricted Electives	48-59
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Units in Major That Also Satisfy the GIRs	(36)
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Total Units Beyond the GIRs Required for SB Degree	180-181
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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.*

Departmental Laboratory Track 1

5.351	Fundamentals of Spectroscopy	4
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5.352	Synthesis of Coordination Compounds and Kinetics	5
5.361	Expression and Purification of Enzyme Mutants	4
5.362	Kinetics of Enzyme Inhibition (CI-M)	5
5.363	Organic Structure Determination	4
5.382	Time- and Frequency-resolved Spectroscopy of Photosynthesis (CI-M)	5
7.102	Laboratory in Molecular Biology	6
<i>Select four of the following:</i>		16
5.353	Macromolecular Prodrugs	
5.371	Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel	
5.372	Chemistry of Renewable Energy	
5.373	Dinitrogen Cleavage ¹	
5.381	Quantum Dots ¹	
5.383	Fast-flow Peptide and Protein Synthesis	
Total Units		49

Departmental Laboratory Track 2

5.351	Fundamentals of Spectroscopy	4
5.352	Synthesis of Coordination Compounds and Kinetics	5
5.363	Organic Structure Determination	4
5.382	Time- and Frequency-resolved Spectroscopy of Photosynthesis (CI-M)	5
7.02[J]	Introduction to Experimental Biology and Communication (CI-M)	18
<i>Select four of the following:</i>		16
5.353	Macromolecular Prodrugs	
5.371	Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel	
5.372	Chemistry of Renewable Energy	
5.373	Dinitrogen Cleavage ¹	
5.381	Quantum Dots ¹	
5.383	Fast-flow Peptide and Protein Synthesis	
Total Units		52

Departmental Laboratory Track 3

5.351	Fundamentals of Spectroscopy	4
5.352	Synthesis of Coordination Compounds and Kinetics	5

5.363	Organic Structure Determination	4
7.02[J]	Introduction to Experimental Biology and Communication (CI-M)	18
7.18	Topics in Experimental Biology (CI-M)	30
Total Units		61

¹ Requires selection of 5.61 as a restricted elective.