CHEMISTRY AND BIOLOGY (COURSE 5-7)

Chemistry and Biology (http://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

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Requirement</td>
<td>6</td>
</tr>
<tr>
<td>Humanities, Arts, and Social Sciences (HASS)</td>
<td>8</td>
</tr>
<tr>
<td>Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.</td>
<td></td>
</tr>
<tr>
<td>Restricted Electives in Science and Technology (REST)</td>
<td>2</td>
</tr>
<tr>
<td>Requirement [can be satisfied by 5.12 and 7.03 in the Departmental Program]</td>
<td></td>
</tr>
<tr>
<td>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]</td>
<td>1</td>
</tr>
<tr>
<td>Total GIR Subjects Required for SB Degree</td>
<td>17</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.03 Principles of Inorganic Chemistry I</td>
<td>12</td>
</tr>
<tr>
<td>or 7.05 General Biochemistry</td>
<td></td>
</tr>
<tr>
<td>5.07[J] Introduction to Biological Chemistry</td>
<td>12</td>
</tr>
<tr>
<td>5.08[J] Fundamentals of Chemical Biology</td>
<td>12</td>
</tr>
<tr>
<td>5.12 Organic Chemistry I</td>
<td>12</td>
</tr>
<tr>
<td>5.13 Organic Chemistry II</td>
<td>12</td>
</tr>
<tr>
<td>5.601 Thermodynamics I</td>
<td>6</td>
</tr>
<tr>
<td>5.611 Introduction to Spectroscopy</td>
<td>6</td>
</tr>
<tr>
<td>7.03 Genetics</td>
<td>12</td>
</tr>
<tr>
<td>7.06 Cell Biology</td>
<td>12</td>
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<tr>
<td>Departmental Laboratory Requirement</td>
<td></td>
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<tr>
<td>5.351 Fundamentals of Spectroscopy</td>
<td>4</td>
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<tr>
<td>5.352 Synthesis of Coordination Compounds and Kinetics (CI-M)</td>
<td>5</td>
</tr>
<tr>
<td>5.353 Macromolecular Prodrugs</td>
<td>4</td>
</tr>
<tr>
<td>7.002 Fundamentals of Experimental Molecular Biology</td>
<td>6</td>
</tr>
<tr>
<td>Select one of the following options:</td>
<td>9-12</td>
</tr>
<tr>
<td>Option 1</td>
<td></td>
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<tr>
<td>5.361 Recombinant DNA Technology</td>
<td></td>
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<tr>
<td>5.362 Cancer Drug Efficacy (CI-M)</td>
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<td>Option 2</td>
<td></td>
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<tr>
<td>7.003[J] Applied Molecular Biology Laboratory (CI-M)</td>
<td></td>
</tr>
<tr>
<td>Restricted Electives</td>
<td>30</td>
</tr>
<tr>
<td>Select 30 units of the following:</td>
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</tr>
<tr>
<td>5.04 Principles of Inorganic Chemistry II</td>
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<tr>
<td>5.363 Organic Structure Determination</td>
<td></td>
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<tr>
<td>5.371 Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel</td>
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<tr>
<td>5.372 Chemistry of Renewable Energy</td>
<td></td>
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<tr>
<td>5.373 Dinitrogen Cleavage</td>
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<tr>
<td>5.381 Quantum Dots</td>
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<tr>
<td>5.382 Time- and Frequency-resolved Spectroscopy of Photosynthesis</td>
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<tr>
<td>5.383 Fast-flow Peptide and Protein Synthesis</td>
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<tr>
<td>5.39 Research and Communication in Chemistry</td>
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<tr>
<td>5.43 Advanced Organic Chemistry</td>
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<tr>
<td>5.602 Thermodynamics II and Kinetics</td>
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<tr>
<td>5.612 Electronic Structure of Molecules</td>
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<tr>
<td>5.62 Physical Chemistry</td>
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<tr>
<td>7.093 Modern Biostatistics</td>
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<tr>
<td>7.094 Modern Computational Biology</td>
<td></td>
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<tr>
<td>7.19 Communication in Experimental Biology (CI-M)</td>
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<tr>
<td>7.20[J] Human Physiology</td>
<td></td>
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<tr>
<td>7.21 Microbial Physiology</td>
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<tr>
<td>7.23[J] Immunology</td>
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<tr>
<td>7.26 Molecular Basis of Infectious Disease</td>
<td></td>
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<tr>
<td>7.27 Principles of Human Disease and Aging</td>
<td></td>
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<tr>
<td>7.28 Molecular Biology</td>
<td></td>
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<tr>
<td>7.29[J] Cellular and Molecular Neurobiology</td>
<td></td>
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<tr>
<td>7.31 Current Topics in Mammalian Biology: Medical Implications</td>
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<tr>
<td>7.32 Systems Biology</td>
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<tr>
<td>Course</td>
<td>Title</td>
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<tr>
<td>7.371</td>
<td>Biological and Engineering Principles Underlying Novel Biotherapeutics</td>
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<tr>
<td>7.45</td>
<td>The Hallmarks of Cancer</td>
</tr>
<tr>
<td>7.46</td>
<td>Building with Cells</td>
</tr>
<tr>
<td>7.49[J]</td>
<td>Developmental Neurobiology</td>
</tr>
</tbody>
</table>

**Unrestricted Electives** 59-62

**Units in Major** 154-157

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.

2 Subject has prerequisites that are outside of the program.