CHEMISTRY (COURSE 5)

Department of Chemistry (http://catalog.mit.edu/schools/science/chemistry/#undergraduatetext)

Bachelor of Science in Chemistry (Standard Option)

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>Restricted Electives in Science and Technology (REST)</td>
<td>2</td>
</tr>
</tbody>
</table>

Laboratory Requirement (12 units) [can be satisfied from among 5.351, 5.352, 5.353, and 5.363 in the Departmental Program]

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

<table>
<thead>
<tr>
<th>Units</th>
</tr>
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<tbody>
<tr>
<td>5.03 Principles of Inorganic Chemistry I 12</td>
</tr>
<tr>
<td>5.07[J] Biological Chemistry I 12</td>
</tr>
<tr>
<td>5.12 Organic Chemistry I 12</td>
</tr>
<tr>
<td>5.13 Organic Chemistry II 12</td>
</tr>
<tr>
<td>5.601 Thermodynamics I 6</td>
</tr>
<tr>
<td>5.602 Thermodynamics II and Kinetics 6</td>
</tr>
<tr>
<td>5.611 Introduction to Spectroscopy 6</td>
</tr>
<tr>
<td>5.612 Electronic Structure of Molecules 6</td>
</tr>
</tbody>
</table>

Select two of the following:
5.04 Principles of Inorganic Chemistry II
5.08[J] Biological Chemistry II
5.43 Advanced Organic Chemistry

5.351 Fundamentals of Spectroscopy 4
5.352 Synthesis of Coordination Compounds and Kinetics (CI-M) 5
5.353 Macromolecular Prodrugs 4
5.361 Expression and Purification of Enzyme Mutants 4

Select a minimum of 14 units from the list of Laboratory Restricted Electives, at least one of which must be a CI-M 1

Choose one of the following options:

Option 1
Select at least 20 units from the list of Laboratory Restricted Electives 1

Option 2

5.39 Research and Communication in Chemistry (CI-M) 2

Units in Major 147

Unrestricted Electives 57-69

Units in Major That Also Satisfy the GIRs (24-36)

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 Laboratory Restricted Electives cannot be double-counted within the program.
2 Before enrolling in 5.39, students must have completed an approved 12-unit UROP or non-credit research experience.

Laboratory Restricted Electives

<table>
<thead>
<tr>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.362 Kinetics of Enzyme Inhibition (CI-M) 5</td>
</tr>
<tr>
<td>5.363 Organic Structure Determination 4</td>
</tr>
<tr>
<td>5.371 Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel 4</td>
</tr>
<tr>
<td>5.372 Chemistry of Renewable Energy 4</td>
</tr>
<tr>
<td>5.373 Dinitrogen Cleavage 4</td>
</tr>
<tr>
<td>5.381 Quantum Dots 4</td>
</tr>
<tr>
<td>5.382 Time- and Frequency-resolved Spectroscopy of Photosynthesis (CI-M) 5</td>
</tr>
<tr>
<td>5.383 Fast-flow Peptide and Protein Synthesis 4</td>
</tr>
</tbody>
</table>

Department of Chemistry (http://catalog.mit.edu/schools/science/chemistry/#undergraduatetext)
Bachelor of Science in Chemistry (Flexible Option)

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 [two subjects can be satisfied by 5.07[J] (if taken under joint number 20.507[J]) and 5.12 in the Departmental Program] | 2
Laboratory Requirement (12 units) [can be satisfied from among 5.351, 5.352, 5.353, and 5.363 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
5.03 Principles of Inorganic Chemistry I | 12
5.07[J] Biological Chemistry I | 12
5.12 Organic Chemistry I | 12
5.601 Thermodynamics I | 6
5.611 Introduction to Spectroscopy | 6
Select 24 units of the following: | 24
5.04 Principles of Inorganic Chemistry II | 12
5.08[J] Biological Chemistry II | 12
5.13 Organic Chemistry II | 12
5.43 Advanced Organic Chemistry | 12
5.602 Thermodynamics II and Kinetics | 6
5.612 Electronic Structure of Molecules | 4
5.62 Physical Chemistry | 4

Elective Focus
Select a minimum of 36 units of coursework forming an intellectually coherent unit in some area, subject to the approval of the department.

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
5.361 Expression and Purification of Enzyme Mutants | 4

Choose one of the following options: 20
Option 1
Select at least 20 units from the list of Laboratory Restricted Electives
Option 2
5.39 Research and Communication in Chemistry (CI-M) 3
Option 3
A set of laboratory subjects of similar extent, subject to the approval of the department

Units in Major | 145
Unrestricted Electives | 59-71
Units in Major That Also Satisfy the GIRs | (24-36)
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 With approval by the faculty advisor, subjects outside the Department of Chemistry may be used.
2 Laboratory Restricted Electives cannot be double-counted within the program.
3 Before enrolling in 5.39, students must have completed an approved 12-unit UROP or non-credit research experience.