Bachelor of Science as Recommended by the Department of Materials Science and Engineering

Department of Materials Science and Engineering (http://catalog.mit.edu/schools/engineering/materials-science-engineering/#undergraduatetext)

Bachelor of Science as Recommended by the Department of Materials Science and Engineering

Students planning to follow this curriculum must submit a program of study no later than the beginning of their junior year.

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>Science Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Humanities, Arts, and Social Sciences (HASS)</td>
</tr>
<tr>
<td></td>
<td>Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.</td>
</tr>
<tr>
<td></td>
<td>Restricted Electives in Science and Technology (REST)</td>
</tr>
<tr>
<td></td>
<td>Requirement [can be satisfied by 18.03 and 3.012, 3.021, or 3.046 in the Departmental Program]</td>
</tr>
<tr>
<td></td>
<td>Laboratory Requirement (12 units) [can be satisfied by 3.014 in the Departmental Program]</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>Units</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>60-63</td>
<td></td>
</tr>
</tbody>
</table>

Select five of the following core subjects:

- 3.014 Materials Laboratory (CI-M)
- 3.012 Fundamentals of Materials Science and Engineering
- 3.016 Computational Methods for Materials Scientists and Engineers
- or 18.03 Differential Equations
- 3.022 Microstructural Evolution in Materials

Restricted Electives
Select three of the following:

- 3.024 Electronic, Optical and Magnetic Properties of Materials
- 3.032 Mechanical Behavior of Materials
- 3.034 Organic and Biomaterials Chemistry
- 3.042 Materials Project Laboratory (CI-M)
- 3.044 Materials Processing

- 3.004 Principles of Engineering Practice
- 3.016 Computational Methods for Materials Scientists and Engineers
- 3.017 Modelling, Problem Solving, Computing, and Visualization
- 3.021 Introduction to Modeling and Simulation
- 3.034A Organic and Biomaterials Chemistry
- 3.046 Thermodynamics of Materials
- 3.048 Advanced Materials Processing
- 3.052 Nanomechanics of Materials and Biomaterials
- 3.053 Molecular, Cellular, and Tissue Biomechanics
- 3.054 Cellular Solids: Structure, Properties, Applications
- 3.055J Biomaterials Science and Engineering
- 3.063 Polymer Physics
- 3.064 Polymer Engineering
- 3.07 Introduction to Ceramics
- 3.071 Amorphous Materials
- 3.072 Symmetry, Structure and Tensor Properties of Materials
- 3.074 Imaging of Materials
- 3.080 Strategic Materials Selection
- 3.081 Industrial Ecology of Materials
- 3.086 Innovation and Commercialization of Materials Technology
- 3.14 Physical Metallurgy
- 3.15 Electrical, Optical, and Magnetic Materials and Devices
- 3.152 Magnetic Materials
- 3.153 Nanoscale Materials
- 3.154 Materials Performance in Extreme Environments
- 3.155J Micro/Nano Processing Technology (CI-M)
- 3.156 Photonic Materials and Devices
BACHELOR OF SCIENCE AS RECOMMENDED BY THE DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING (COURSE 3-A)

3.171 Structural Materials
3.18 Materials Science and Engineering of Clean Energy
3.19 Sustainable Chemical Metallurgy

Select six electives from a proposal of study approved by the department.

Units in Major 180-183

Unrestricted Electives 48

Units in Major That Also Satisfy the GIRs (36-39)

Total Units Beyond the GIRs Required for SB Degree 192

The units for any subject that counts as one of the 17 GIR subjects cannot also be counted as units required beyond the GIRs.

2.009 The Product Engineering Process
2.671 Measurement and Instrumentation
3.042 Materials Project Laboratory
5.382 & 5.383 Time- and Frequency-resolved Spectroscopy of Photosynthesis and Fast-flow Peptide and Protein Synthesis
6.021[J] Cellular Neurophysiology and Computing
7.02[J] Introduction to Experimental Biology and Communication
10.26 Chemical Engineering Projects Laboratory
10.28 Chemical-Biological Engineering Laboratory
10.29 Biological Engineering Projects Laboratory
10.467 Polymer Science Laboratory

Sequence of the following three subjects (for a total of 12 units) counts as one CI-M:

5.361 Expression and Purification of Enzyme Mutants
5.362 Kinetics of Enzyme Inhibition
5.363 Organic Structure Determination

Example of a 3-A Program
A student planning a career in medicine might select the following subjects, in addition to the above requirements, in order to satisfy the premedical requirements recommended by the Global Education and Career Development Center:

5.12 Organic Chemistry I 12
5.13 Organic Chemistry II 12
5.310 Laboratory Chemistry 12
7.02[J] Introduction to Experimental Biology and Communication 18
7.05 General Biochemistry 12

Communication-Intensive Subjects in the Major

Required subject (see degree chart above):
3.014 Materials Laboratory 12

Choose one of the following as the second CI-M subject:
2.009 The Product Engineering Process
2.671 Measurement and Instrumentation
3.042 Materials Project Laboratory
5.382 & 5.383 Time- and Frequency-resolved Spectroscopy of Photosynthesis and Fast-flow Peptide and Protein Synthesis
6.021[J] Cellular Neurophysiology and Computing
7.02[J] Introduction to Experimental Biology and Communication
10.26 Chemical Engineering Projects Laboratory
10.28 Chemical-Biological Engineering Laboratory
10.29 Biological Engineering Projects Laboratory
10.467 Polymer Science Laboratory

Sequence of the following three subjects (for a total of 12 units) counts as one CI-M:

5.361 Expression and Purification of Enzyme Mutants
5.362 Kinetics of Enzyme Inhibition
5.363 Organic Structure Determination