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 the 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.

<table>
<thead>
<tr>
<th>Summary of Subject Requirements</th>
<th>Subjects</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 18.03 and 3.012, 3.021, or 3.046 in the Departmental Program]</td>
<td></td>
</tr>
<tr>
<td>Laboratory Requirement (12 units) [can be satisfied by 3.014 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.

<table>
<thead>
<tr>
<th>Required Subjects</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.014 Materials Laboratory (CI-M)</td>
<td>12</td>
</tr>
<tr>
<td>Select five of the following core subjects:</td>
<td>60-63</td>
</tr>
<tr>
<td>3.012 Fundamentals of Materials Science and Engineering</td>
<td></td>
</tr>
<tr>
<td>3.016 Computational Methods for Materials Scientists and Engineers</td>
<td></td>
</tr>
<tr>
<td>or 18.03 Differential Equations</td>
<td></td>
</tr>
</tbody>
</table>

| 3.022 Microstructural Evolution in Materials            |       |
| 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                              |       |

**Restricted Electives**
Select three of the following: 36

| 3.004 Principles of Engineering Practice                |       |
| 3.016 Computational Methods for Materials Scientists and Engineers | 2      |
| 3.017 Modelling, Problem Solving, Computing, and Visualization |       |
| 3.021 Introduction to Modeling and Simulation           | 2      |
| 3.034A Organic and Biomaterials Chemistry                | 3      |
| 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 |       |
| 3.055 Molecular, Cellular, and Tissue Biomechanics       |       |
| 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     |       |
### Bachelor of Science as Recommended by the Department of Materials Science and Engineering (Course 3-A)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.155[J]</td>
<td>Micro/Nano Processing Technology (CI-M)</td>
<td></td>
</tr>
<tr>
<td>3.156</td>
<td>Photonic Materials and Devices</td>
<td></td>
</tr>
<tr>
<td>3.171</td>
<td>Structural Materials and Manufacturing</td>
<td></td>
</tr>
<tr>
<td>3.18</td>
<td>Materials Science and Engineering of Clean Energy</td>
<td></td>
</tr>
<tr>
<td>3.19</td>
<td>Sustainable Chemical Metallurgy</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Units in Major</th>
<th>180-183</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted Electives</td>
<td>48</td>
</tr>
<tr>
<td>Units in Major That Also Satisfy the GIRs</td>
<td>(36-39)</td>
</tr>
<tr>
<td>Total Units Beyond the GIRs Required for SB Degree</td>
<td>192</td>
</tr>
</tbody>
</table>

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. **18.032 Differential Equations** is also an acceptable option.
2. These subjects may count as part of the required subjects or as restricted electives, but not both.
3. Students can take **3.034** as a required subject or **3.034A** as a restricted elective, but cannot count both subjects toward their major.
4. Students must develop a program of six elective subjects appropriate to their stated goals.

### Communication-Intensive Subjects in the Major

<table>
<thead>
<tr>
<th>Required subject (see degree chart above):</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.014 Materials Laboratory</td>
</tr>
<tr>
<td>Choose one of the following as the second CI-M subject:</td>
</tr>
<tr>
<td>2.009 The Product Engineering Process</td>
</tr>
<tr>
<td>2.671 Measurement and Instrumentation</td>
</tr>
<tr>
<td>3.042 Materials Project Laboratory</td>
</tr>
<tr>
<td>7.02[J] Introduction to Experimental Biology and Communication</td>
</tr>
<tr>
<td>10.26 Chemical Engineering Projects Laboratory</td>
</tr>
<tr>
<td>10.28 Chemical-Biological Engineering Laboratory</td>
</tr>
<tr>
<td>10.29 Biological Engineering Projects Laboratory</td>
</tr>
<tr>
<td>10.467 Polymer Science Laboratory</td>
</tr>
</tbody>
</table>

### 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 Career Advising and Professional Development: