MATERIALS SCIENCE AND ENGINEERING (COURSE 3)

Bachelor of Science in Materials Science and Engineering

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) Requirement; at least two of these subjects must be designated as communication-intensive (CI-H) to fulfill the Communication Requirement.</td>
<td>8</td>
</tr>
<tr>
<td>Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 3.012 and 18.03 in the Departmental Program]</td>
<td>2</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>3.012</td>
<td>15</td>
</tr>
<tr>
<td>3.014</td>
<td>12</td>
</tr>
<tr>
<td>3.022</td>
<td>12</td>
</tr>
<tr>
<td>3.024</td>
<td>12</td>
</tr>
<tr>
<td>3.032</td>
<td>12</td>
</tr>
<tr>
<td>3.034</td>
<td>12</td>
</tr>
<tr>
<td>3.042</td>
<td>12</td>
</tr>
<tr>
<td>3.044</td>
<td>12</td>
</tr>
<tr>
<td>18.03</td>
<td>12</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>12</td>
</tr>
</tbody>
</table>

Select one of the following: 9-12

8.00 Introduction to Computer Science and Programming
6.0001 Introduction to Computer Science Programming in Python and Introduction to Computational Thinking and Data Science

Select 48 units from the following: 48

<table>
<thead>
<tr>
<th>3.004</th>
<th>Principles of Engineering Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.016</td>
<td>Computational Methods for Materials Scientists and Engineers</td>
</tr>
<tr>
<td>3.017</td>
<td>Modelling, Problem Solving, Computing, and Visualization</td>
</tr>
<tr>
<td>3.021</td>
<td>Introduction to Modeling and Simulation</td>
</tr>
<tr>
<td>3.046</td>
<td>Thermodynamics of Materials</td>
</tr>
<tr>
<td>3.048</td>
<td>Advanced Materials Processing</td>
</tr>
<tr>
<td>3.052</td>
<td>Nanomechanics of Materials and Biomaterials</td>
</tr>
<tr>
<td>3.053</td>
<td>Molecular, Cellular, and Tissue Biomechanics</td>
</tr>
<tr>
<td>3.054</td>
<td>Cellular Solids: Structure, Properties, Applications</td>
</tr>
<tr>
<td>3.055</td>
<td>Biomaterials Science and Engineering</td>
</tr>
<tr>
<td>3.063</td>
<td>Polymer Physics</td>
</tr>
<tr>
<td>3.064</td>
<td>Polymer Engineering</td>
</tr>
<tr>
<td>3.07</td>
<td>Introduction to Ceramics</td>
</tr>
<tr>
<td>3.071</td>
<td>Amorphous Materials</td>
</tr>
<tr>
<td>3.072</td>
<td>Symmetry, Structure and Tensor Properties of Materials</td>
</tr>
<tr>
<td>3.074</td>
<td>Imaging of Materials</td>
</tr>
<tr>
<td>3.080</td>
<td>Strategic Materials Selection</td>
</tr>
<tr>
<td>3.081</td>
<td>Industrial Ecology of Materials</td>
</tr>
<tr>
<td>3.086</td>
<td>Innovation and Commercialization of Materials Technology</td>
</tr>
<tr>
<td>3.14</td>
<td>Physical Metallurgy</td>
</tr>
<tr>
<td>3.15</td>
<td>Electrical, Optical, and Magnetic Materials and Devices</td>
</tr>
</tbody>
</table>
### 3.152 Magnetic Materials
### 3.153 Nanoscale Materials
### 3.154[J] Materials Performance in Extreme Environments
### 3.155[J] Micro/Nano Processing Technology (CI-M)
### 3.156 Photonic Materials and Devices
### 3.18 Materials Science and Engineering of Clean Energy
### 3.19 Sustainable Chemical Metallurgy

#### Units in Major

<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>(39)</td>
</tr>
<tr>
<td>Total Units Beyond the GIRs Required for SB Degree</td>
<td>189-192</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.

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1. **18.032 Differential Equations** is also an acceptable option.
2. These subjects can count as part of the required subjects or as restricted electives, but not both.
3. Students may elect 9–12 units.
4. Substitution of similar subjects may be permitted by petition.