BACHELOR OF SCIENCE AS RECOMMENDED BY THE DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING (COURSE 3-A)

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

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

Students must submit a plan of study (the Course 3-A Program Proposal, available from the DMSE Academic Office) 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>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>
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<tr>
<td>Restricted Electives in Science and Technology (REST) Requirement [can be satisfied by 18.03 and 3.020, 3.021, or 3.046 in the Departmental Program]</td>
<td>2</td>
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<tr>
<td>Laboratory Requirement (12 units) [can be satisfied by 3.010 in the Departmental Program]</td>
<td>1</td>
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<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

| 18.03 Differential Equations ¹ | 12 |
| 3.010 Structure of Materials (partial CI-M) | 12 |
| 3.019 Introduction to Symbolic and Mathematical Computing | 3 |
| 3.020 Thermodynamics of Materials (partial CI-M) | 12 |
| Select three of the following subjects: | 30-36 |
| 3.013 Mechanics of Materials | |

Restricted Electives

| 3.023 Synthesis and Design of Materials | |
| 3.029 Mathematics and Computational Thinking for Materials Scientists and Engineers I | |
| 3.030 Microstructural Evolution in Materials | |
| 3.033 Electronic, Optical and Magnetic Properties of Materials | |
| 3.039 Mathematics and Computational Thinking for Materials Scientists and Engineers II | |
| 3.044 Materials Processing | |
| 3.042 Materials Project Laboratory (CI-M) | |

Restricted Electives

Select 36 units from the list of Restricted Electives in Course 3/3-A | 36 |

Program Electives

Select 66 units from a proposal of study approved by the department | 66 |

Units in Major | 171-177 |

Unrestricted Electives | 48 |

Units in Major That Also Satisfy the GIRs | (36) |

Total Units Beyond the GIRs Required for SB Degree | 183-189 |

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, CC.1803 Differential Equations, or ES.1803 Differential Equations are also acceptable options.

² Students must develop a program of elective subjects totaling 66 units appropriate to their stated goals in their Course 3-A Program Proposal as approved by the DMSE Undergraduate Committee.
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3.063  Polymer Physics  12
3.064  Polymer Engineering  12
3.07  Introduction to Ceramics  12
3.071  Amorphous Materials  12
3.074  Imaging of Materials  12
3.080  Strategic Materials Selection  12
3.081  Industrial Ecology of Materials  12
3.086  Innovation and Commercialization of Materials Technology  12
3.087  Materials, Societal Impact, and Social Innovation  12
3.088  The Social Life of Materials  12
3.14  Physical Metallurgy  12
3.15  Electrical, Optical, and Magnetic Materials and Devices  12
3.152  Magnetic Materials  12
3.156  Photonic Materials and Devices  12
3.16  Industrial Challenges in Metallic Materials Selection  12
3.17  Principles of Manufacturing  12
3.171  Structural Materials and Manufacturing  12
3.18  Materials Science and Engineering of Clean Energy  12
3.19  Sustainable Chemical Metallurgy  12

10.29  Biological Engineering Projects Laboratory
10.467  Polymer Science Laboratory

1 The combination of 3.010 and 3.020 is equivalent to one communication-intensive subject (CI-M) in fulfillment of the Communication Requirement.
2 Subjects listed, except 3.042 and 3.155[J], have prerequisites that are outside the program.

Examples of a 3-A Program
Examples of 3-A programs may be obtained from the DMSE Academic Office, Room 6-107, 617-258-5816.

Pre-Health
A student planning a career in medicine might select the following subjects, which may be integrated into the 66 units from a proposal of study approved by the department specified above, in order to satisfy the medical school requirements recommended by Career Advising and Professional Development.

7.002  Fundamentals of Experimental Molecular Biology  6
5.12  Organic Chemistry I  12
5.13  Organic Chemistry II  12
5.310  Laboratory Chemistry  12
7.05  General Biochemistry  12

Communication-Intensive Subjects in the Major
Required subjects (see degree chart above):

3.010 & 3.020  Structure of Materials and Thermodynamics of Materials (CI-M)  24

Choose one of the following as the second CI-M subject:  9-15

2.009  The Product Engineering Process
2.671  Measurement and Instrumentation
3.042  Materials Project Laboratory
7.003[J]  Applied Molecular Biology Laboratory
10.26  Chemical Engineering Projects Laboratory
10.28  Chemical-Biological Engineering Laboratory