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/#undergraduatetext)

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 | 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 [can be satisfied by 18.03 and 3.020, 3.021, or 3.046 in the Departmental Program] | 2
Laboratory Requirement (12 units) [can be satisfied by 3.010 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 | Units
--- | ---
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 |  
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.

Restricted Electives

| 3.004 | Principles of Engineering Practice | 12 |
| 3.017 | Modelling, Problem Solving, Computing, and Visualization | 12 |
| 3.021 | Introduction to Modeling and Simulation | 12 |
| 3.046 | Advanced Thermodynamics of Materials | 12 |
| 3.052 | Nanomechanics of Materials and Biomaterials | 12 |
| 3.053[J] | Molecular, Cellular, and Tissue Biomechanics | 12 |
| 3.054 | Cellular Solids: Structure, Properties, Applications | 12 |
| 3.055[J] | Biomaterials Science and Engineering | 12 |
| 3.056[J] | Materials Physics of Neural Interfaces | 12 |
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
3.14 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
3.171 Structural Materials and Manufacturing 12
3.18 Materials Science and Engineering of Clean Energy 12
3.19 Sustainable Chemical Metallurgy 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) 1

Choose one of the following as the second CI-M subject: 2

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
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.

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<td>5.12</td>
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