

MATERIALS SCIENCE AND ENGINEERING (COURSE 3)

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

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.

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 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
3.013 Mechanics of Materials	12
3.019 Introduction to Symbolic and Mathematical Computing	3
3.020 Thermodynamics of Materials (partial CI-M)	12
3.023 Synthesis and Design of Materials	12
3.030 Microstructural Evolution in Materials	12
3.033 Electronic, Optical and Magnetic Properties of Materials	12
3.042 Materials Project Laboratory (CI-M)	12
3.044 Materials Processing	12

Select 18 units from the following: 18

1.00	Engineering Computation and Data Science	
2.086	Numerical Computation for Mechanical Engineers	
3.021	Introduction to Modeling and Simulation ²	
3.029	Mathematics and Computational Thinking for Materials Scientists and Engineers I	
3.039	Mathematics and Computational Thinking for Materials Scientists and Engineers II	
6.100A	Introduction to Computer Science Programming in Python	
6.100B	Introduction to Computational Thinking and Data Science	

Select one of the following: 9-12

3.930 & 3.931	Internship Program and Internship Program	
3.THU	Undergraduate Thesis	

Restricted Electives

Select 36 units from the list of Restricted Electives ² 36

Units in Major 174-177

Unrestricted Electives 48

Units in Major That Also Satisfy the GIRs (36)

Total Units Beyond the GIRs Required for SB Degree 186-189

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, and ES.1803 Differential Equations are also acceptable options.

² Substitution of similar subjects may be permitted by petition.

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[[Molecular, Cellular, and Tissue Biomechanics	12
3.054	Cellular Solids: Structure, Properties, Applications	12

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3.055[[]]	Biomaterials Science and Engineering	12
3.056[[]]	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
3.088	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
3.154[[]]	Materials Performance in Extreme Environments	12
3.155[[]]	Micro/Nano Processing Technology (CI-M)	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