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 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.

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 3.012, 3.021, or 3.046 in the Departmental Program]	2
Laboratory Requirement (12 units) [can be satisfied by 3.014 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
3.014	Materials Laboratory (CI-M)	12
Select five of the following core subjects:		60-63
3.012	Fundamentals of Materials Science and Engineering	
3.016	Computational Methods for Materials Scientists and Engineers [1,2]	
or 18.03	Differential Equations	
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[J]	Molecular, Cellular, and Tissue Biomechanics	
3.054	Cellular Solids: Structure, Properties, Applications	
3.055[J]	Biomaterials Science and Engineering	
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[J]	Materials Performance in Extreme Environments	
3.155[J]	Micro/Nano Processing Technology (CI-M)	
3.156	Photonic Materials and Devices	

3.171	Structural Materials	
3.18	Materials Science and Engineering of Clean Energy	
3.19	Sustainable Chemical Metallurgy	
Select six electives from a proposal of study approved by the department [4]		72
Units in Major		180-183
Unrestricted Electives		48
Units in Major That Also Satisfy the GIRs		(36-39)
Total Units Beyond the GIRs Required for SB Degree		192

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

Required subject (see degree chart above):		
3.014	Materials Laboratory	12
Choose one of the following as the second CI-M subject:		9-18
2.009	The Product Engineering Process	
2.671	Measurement and Instrumentation	
3.042	Materials Project Laboratory	
3.155[J]	Micro/Nano Processing Technology	
5.382 & 5.383	Time- and Frequency-resolved Spectroscopy of Photosynthesis and Fast-flow Peptide and Protein Synthesis	
6.021[J]	Cellular Neurophysiology and Computing	
7.02[J]	Introduction to Experimental Biology and Communication	
10.26	Chemical Engineering Projects Laboratory	
10.28	Chemical-Biological Engineering Laboratory	
10.29	Biological Engineering Projects Laboratory	
10.467	Polymer Science Laboratory	
Sequence of the following three subjects (for a total of 12 units) counts as one CI-M:		
5.361	Expression and Purification of Enzyme Mutants	
5.362	Kinetics of Enzyme Inhibition	
5.363	Organic Structure Determination	

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 the Global Education and Career Development Center:

5.12	Organic Chemistry I	12
5.13	Organic Chemistry II	12
5.310	Laboratory Chemistry	12
7.02[J]	Introduction to Experimental Biology and Communication	18
7.05	General Biochemistry	12