

# MATERIALS SCIENCE

## AND ENGINEERING, COURSE 3

### CONTACT

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### DESCRIPTION

Materials engineers are involved in the extraction, development, processing, and testing of the materials used to create a diversity of products. Innovations in engineering materials are at the core of every major advancement in technology. Today, materials scientists and engineers are developing materials for the next wave of technological advances: Nanomaterials for electronic devices; biomaterials for implants; new materials for high performance batteries and solar cells; organic semiconductors for flexible electronics; and high-performance plastics and composites for automotive applications.

### INSIDE [COURSE 3](#)

- 3 Materials Science and Engineering
- 3-A B.S. as recommended by the Department of Materials Science and Engineering
- 3-C Archaeology and Materials as recommended by the Department of Materials Science and Engineering

### INTRODUCTORY CLASSES

- 3.001 **Introduction to Materials Science and Engineering**  
Provides a broad introduction to topics in materials science and the curricula in the Department of Materials Science and Engineering's core subjects. Lectures emphasize conceptual and visual examples of materials phenomena and engineering, interspersed with guest speakers from both inside and outside academia to show possible career paths. Subject can count toward the 6-unit discovery-focused credit limit for first year students. Preference to first-year students.
- 3.003 **Principles of Engineering Practice**  
Introduces students to the interdisciplinary nature of 21st-century engineering projects with three threads of learning: a technical toolkit, a social science toolkit, and a methodology for problem-based learning. Students encounter the social, political, economic, and technological challenges of engineering practice by participating in actual engineering projects involving public transportation and information infrastructure with faculty and industry. Student teams create prototypes and mixed media reports with exercises in project planning, analysis, design, optimization, demonstration, reporting and team building. Preference to first-year students.

### COURSE 3-FRIENDLY UROP AREAS

Research Laboratory for Electronics (RLE)  
Laboratory for Engineering Materials (LEM)  
Materials Research Laboratory (MRL)  
Environmental Solutions Initiative. (ESI)  
MIT Energy Initiative (EI)  
Microsystems Tech Lab (MTL)  
Center for Materials Research in Archaeology & Ethnology (MRAE)

Health Sciences and Technology (HST)  
Institute for Data, Systems, Society (IDS)  
Institute for Soldier Nanotech (ISN)  
Media Arts and Sciences (MAS)  
MIT Climate and Sustainability (MCSC)  
Nuclear Reactor Lab (NRL)

### GET INVOLVED WITH COURSE 3

MIT Energy Club  
Mining, Oil, and Gas Club  
Society of Petroleum Engineers  
Society of Undergraduate Materials Students (SUMS)

### SKILLS

Knowledge of material properties  
Computer modeling software  
Interpret and write technical documentation  
Strong communication

### POSSIBLE FUTURE POSITIONS

- **Materials engineer:** Work on the structure, processing, properties and performance of engineering materials.
- **Process engineer:** Develop and maintain the processes required to synthesize, purify, process, shape, and control materials.
- **Research and development scientist/engineer (R&D):** Research structure, processing, properties and performance of materials for the development and use of applications in technology.

### CAREER INDUSTRY EXAMPLES

Aerospace and Defense	Consulting	Non-profit agency
Automotive	Engineering	Pharmaceuticals
Chemicals and Materials	Financial services	

### SAMPLE EMPLOYERS

Alcoa	Formlabs	Northrop Grumman
Ambri, Inc.	General Motors	NVBOTS
Boeing	Markforged	SanDisk
Cornerstone Research	New Classrooms	Vaxess Technologies, Inc.