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.

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.
INSIDE COURSE 3

3    Materials Science and Engineering    Department size: 76
3-A  B.S. as recommended by the Department of Materials Science and Engineering    Department size: 14
3-C  Archaeology and Materials as recommended by the Department of Materials Science and Engineering

DEPARTMENT FAVORITES

3.024  **Electrical, Optical and Magnetic Properties of Materials**  
Uses fundamental principles of quantum mechanics, solid state physics, electricity and magnetism to describe how the electronic, optical and magnetic properties of materials originate. Illustrates how these properties can be designed for particular applications, such as diodes, solar cells, optical fibers, and magnetic data storage.

3.034  **Organic and Biomaterials Chemistry**  
Focuses on the chemistry and chemical structure-property relationships of soft synthetic and biologically derived materials, and aims to develop a fundamental understanding of the molecular nature of materials.

3.042  **Materials Project Laboratory**  
Student project teams design and fabricate a working prototype using materials processing technologies appropriate for the materials and device of interest. Goals include using MSE fundamentals in a practical application; understanding trade-offs between design, processing, and performance and cost; and fabrication of a deliverable prototype. Emphasis on teamwork, project management, communications and computer skills, with extensive hands-on work using student and MIT laboratory shops.

COURSE 3-FRIENDLY LABS

Research Laboratory for Electronics (RLE)  
Laboratory for Engineering Materials (LEM)  
Materials Research Laboratory (MRL)

GET INVOLVED WITH COURSE 3

MIT Energy Club  
Mining, Oil, and Gas Club  
Society of Petroleum Engineers

Sources: MIT Global Education & Career Development, Graduating Student Survey, Collegeboard.org, University of Minnesota Center for Academic Planning. UPOP is here to help you! Come talk to us in 1-123 or email us at upopstudentprogram@mit.edu