

# Mechanical Engineering

## Course 2

Given society's increasing dependence upon technology, mechanical engineers will continue to be at center stage in addressing technological and societal issues in such diverse fields as energy, manufacturing, environment, nanotechnology, transportation, biomedicine, ocean engineering, and materials. These fields will demand the best of mechanical engineers' imagination, creativity, knowledge, and skills. The Department of Mechanical Engineering at MIT has a long, rich history of educating individuals capable of providing the leadership necessary to address these needs in both industry and academia. For nearly 150 years, the educational and research programs of the department have enjoyed an outstanding reputation and tradition of excellence.

### **Mechanical Engineering at MIT**

The educational opportunities in the department allow students to address important scientific and technological issues in a wide variety of fields through collaboration with faculty members and their research groups. The formal educational program leading to the SB degree combines a foundation in the engineering sciences with project-oriented laboratory and design experience.

The goal of the department is to produce future leaders in industry, engineering, academia, and government with a can-do attitude backed by knowledge, wisdom, and ethics. To achieve this goal, and to ensure that our graduates are able to adapt to the changing technological world, the department has developed innovative curricula well suited to the needs of the present and the future.

The Department of Mechanical Engineering is the second-largest department at MIT, with an undergraduate enrollment (sophomore through senior) of about 450 students. In addition, there are approximately 525 graduate students pursuing SM and PhD degrees. There are approximately 75 faculty members within the department.

### **Undergraduate Program**

In order to prepare students for careers in a broad spectrum of professional fields and provide them with the greatest number of career options upon graduation, the traditional curriculum of the Department of Mechanical Engineering is highly structured. This curriculum is designed to combine breadth and depth within the disciplinary subjects while complementing classroom learning with practical applications learned through laboratory experiments and design projects.

In addition to satisfying the General Institute Requirements (GIRs), this curriculum consists of a set of required subjects, divided into four sequences: mechanics and materials, thermal and fluids engineering, systems modeling and control, and design and manufacturing. Additional subjects in instrumentation and laboratory work complement these four sequences. In the senior year, students select two or more subjects from a set of departmental electives. As an adjunct to this curriculum, students also complete a senior thesis.

The department also offers an alternative undergraduate program, Course 2A, which enables students to combine an interest in mechanical engineering with other disciplines. Students take a core set of subjects in mechanical engineering and select a coordinated group of upper level subjects in an area of technical interest with the approval of the department. The Course 2A degree is an ABET-accredited engineering degree.

The third SB degree offered by the department is in Mechanical and Ocean Engineering, Course 2OE. This degree is for students interested in the engineering aspects of the ocean sciences, exploration of the ocean, and utilization of the oceans for transportation, defense, and resources.

For students majoring in other disciplines, the department offers the Minor in Mechanical Engineering. This requires satisfactory completion of six subjects

from the core and electives of the SB degree program as approved by the undergraduate officer of the department.

### **Research**

The research mission of the department is to make an impact on society through the generation of new knowledge and technological innovation. Strong research programs are a fundamental part of the MIT education, and our students — often attracted by our research reputation — are the basis of these research programs. Students at all levels are encouraged to participate in research projects through the Undergraduate Research Opportunities program (UROP).

The research interests of the faculty are diverse, covering areas from fundamental studies of physical phenomena to the development of products and devices that meet the needs of society. Some areas include energy conversion and thermal science, biomedical engineering, controls, design and manufacturing, fluids and computational methods, mechanics and materials, oceanography, naval architecture, water purification, marine hydrodynamics, precision engineering, robotics, and mechatronics.

The department has an active chapter of the national mechanical engineering honor society (Pi Tau Sigma) and active student participation in the American Society of Mechanical Engineers (ASME).

### **Post-Baccalaureate Opportunities**

Our graduates find a broad range of opportunities for employment and continuing education. In recent years approximately two-thirds have indicated that they intend to pursue a graduate degree within five years of graduation. Those joining industry upon graduation have accepted positions in diverse areas including design, analysis, manufacturing, and management. A number of students use their mechanical engineering background to launch careers in other disciplines, such as medicine and law.

### **Contact Information**

For more information, please contact:  
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The undergraduate administrator is Ms. Brandy Baker. Additional information is also available on the web at <http://meche.mit.edu/>.

The MIT Course Catalog contains further information on the Institute, including all graduate and undergraduate courses and programs. For details on ordering the course catalogue, please visit the MIT Press Bookstore website at <http://web.mit.edu/bookstore/www/bulletin.html>.

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