MECHANICAL ENGINEERING

COURSE 2

CONTACT

Academic Administrator: Emma Dunn, emmadunn@mit.edu

DESCRIPTION

Mechanical Engineering students at MIT learn by doing, experiencing a level of understanding that only occurs through creation. Mechanical Engineering is a versatile and interdisciplinary field that includes everything from nano engineering at the smallest scales – down to one-thousandth the size of a human hair – to the biggest systems, such as those for large-scale manufacturing or water desalination. We bring our signature passion, creativity, and rigor to bear on the world's greatest challenges. Within the Department of Mechanical Engineering at MIT, we currently have three programs of study: 1. Course 2 is a traditional program which prepares students for a broad range of career choices in the field of mechanical engineering. 2. Course 2-OE, a structured program for students who wish to combine a firm foundation in mechanical engineering with a specialization in ocean engineering. 3. Course 2-A, a customizable bachelor's degree which allows students to combine the essential elements of the traditional mechanical engineering program with their personal interests by choosing to study in an additional complementary field, such as robotics, bio, or energy. Students majoring in mechanical engineering find work across the board in many different fields from software to space exploration to product design–the possibilities are endless!

INSIDE COURSE 2

2	Mechanical Engineering
2-A	Engineering as recommended by the Departmentof Mechanical Engineering
2-OE	Mechanical and Ocean Engineering

INTRODUCTORY CLASSES

2.00A **Fundamentals of Engineering Design: Explore Space, Sea and Earth**
Student teams formulate and complete space/earth/ocean exploration-based design projects with weekly milestones. Introduces core engineering themes, principles, and modes of thinking. Specialized learning modules enable teams to focus on the knowledge required to complete their projects, such as machine elements, electronics, design process, visualization and communication. Includes exercises in written and oral communication and team building. Examples of projects include surveying a lake for millfoil, from a remote controlled aircraft, and then sending out robotic harvesters to clear the invasive growth; and exploration to search for the evidence of life on a moon of Jupiter, with scientists participating through teleoperation and supervisory control of robots.

2.00B **Toy Product Design**
Toy Product Design is an introduction to the product design process with a focus on designing for play and entertainment. It is a project-centric class. Students work in small teams of 5–6 members to design and prototype new toys.

2.00C **Design for Complex Environmental Issues: Building Solutions and Communicating Ideas**

Students work in small groups, under the guidance of researchers from MIT, to pursue specific aspects of the year's Terrascope problem. Teams design and build prototypes, graphic displays and other tools to communicate their findings and display them in a Bazaar of Ideas open to the MIT community. Some teams develop particular solutions, others work to provide deeper understanding of the issues, and others focus on ways to communicate these ideas with the general public. Students' work is evaluated by independent experts. Offers students an opportunity to develop ideas from the fall semester and to work in labs across MIT. Limited to first-year students.

COURSE 2 UROP LABS

BioInstrumentation Laboratory
Biomimetic Robotics Lab
Device Realization Lab
Device Research Laboratory
Energy and Microsystems Innovation Global Engineering and Research (GEAR)
Laboratory for Biomechanics and Human Rehabilitation
Laboratory for Biologically Inspired Photonic Engineering
Laboratory for Manufacturing and Productivity
Mechatronics Research Lab
MIT Ideation Laboratory
MIT Mechanosynthesis Group
MIT Pappalardo Labs
MIT Precision Engineering Research Group
Nanoelectronics Lab
Rohsenow Kendall Heat Transfer Laboratory
Therapeutic Technology Design & Development Lab
Toy Product Design Lab

COURSE 2 FRIENDLY RESEARCH AREAS

Sea Grant (SEAG)
MIT Lincoln Labs
Research Lab for Electronics (RLE)
Laboratory for Manufacturing and Productivity (LMP)

COURSE 2 STUDENT ORGANIZATIONS AND CLUBS

Mechanical Engineering Student Society (MESS)	Engineering without Borders	Rocket Team
Design for America	Assistive Technology Club	UAV Team
Design / Build / Fly	Robotics Team	

SKILLS

Read and interpret blueprints, technical drawings, and schematics

Research, design, evaluate, install, operate, or maintain mechanical products

Knowledge of Computer Aided Design (CAD) software

Project management skills

POSSIBLE FUTURE POSITIONS

- **Design engineer:** Develop mechanical automation designs from customer specifications. Conduct design reviews with customers. Utilize analytical tools to assist in the design process, and interface with suppliers.
- **Manufacturing engineer:** Plan the tooling, construction, and assembly of the product as dictated by design specifications.
- **Quality engineer:** Support development and ensure compliance with company quality management systems in accordance with industry standards, and provide technical support to product engineering, marketing, manufacturing, etc.

CAREER INDUSTRY EXAMPLES

Aerospace	Consumer manufacturing	Nuclear Engineer
Automotive	Energy and utilities	Pumps and fluid systems
Biomedical	Environmental Engineer	Research and development
Computer software	Health and medicine	
Consulting	Industrial engineering	

SAMPLE EMPLOYERS

Amazon.com	Creare, Inc.	SharkNinja
Apple	Ford Motor Company	SpaceX
Aurora Flight Sciences	Jet Propulsion Laboratory	Tesla
Boeing	Nest	
Brooks Automation	Northrop Grumman