

Civil & Environmental Engineering

Course 1

The Department of Civil and Environmental Engineering (CEE) offers undergraduate and graduate degree programs in the areas of infrastructure, the environment, and systems engineering. By deploying the principle of “big engineering,” CEE faculty combine science and engineering to solve many of the world’s grand challenges. The work of our students focuses on large-scale impact on people and sustainability, covering a spectrum of activities from environment to infrastructure to systems.

Undergraduate program

SB in Civil and Environmental Engineering (1-ENG)

CEE has one undergraduate program leading to a Bachelor of Science degree. 1-ENG emphasizes a strong foundation in math, computation, probability and statistics, data analysis, and design that students satisfy by taking a set of General Departmental Requirements (GDRs). In addition, the program offers students the choice to achieve significant depth in one of three core areas: Environment, Mechanics and Materials, or Systems. The structure of the degree program enables our students to focus their studies in the domains of environment and infrastructure.

The Mechanics and Materials core provides a solid foundation for practice in both classical and newly developing areas of civil engineering, including structural analysis and design, engineering materials, geotechnical analysis and design, and sustainable built environments. The Systems core prepares students to address challenges from an integrative systems perspective, focusing on transportation and logistics along with water and energy systems. The Environment core allows students to focus on areas like air quality, atmospheric chemistry, environmental chemistry, hydrology and environmental fluid mechanics, and ecology and environmental microbiology.

In addition to completing the GDRs and a core, a student then selects a set of restricted and unrestricted electives that consists of cohesive set subjects to be picked in consultation with the student advisor to achieve significant depth consistent with the student’s interest.

This rigorous curriculum trains students to understand, invent, and lead with creative design, and prepares students to define the future and change the world.

Real-world projects and research experiences are an integral part of the Course 1 undergraduate experience. CEE emphasizes faculty-student interactions in a variety of ways, from UROP projects, field work and hands-on laboratory subjects, to one-on-one contact time.

Undergraduate minors

For students majoring in another discipline, the department offers three minors:

- Civil and Environmental Systems
- Environmental Engineering Science
- Civil Engineering

Each minor consists of a set of subjects designed to deliver core knowledge in each of the areas.

The *Civil and Environmental Systems* combines principles and knowledge from across civil, environmental and systems engineering into a hyper-concentrated study focused on both the built and natural worlds. Its subjects will cover civil and environmental engineering design, project evaluation and management, principles of energy and water sustainability, urban networks, transportation systems modeling, and water resource systems.

The *Environmental Engineering Science* minor makes the popular Traveling Research Environmental Experiences ([TRES](#)) fieldwork during the Independent Activities Period (IAP) a program requirement. Other subjects in the minor focus on ecology, microbiology, water resources, and lab subjects.

The *Civil Engineering* minor offers subjects that reflect the wide extent of education that now encompasses the field, including solid and fluid mechanics, materials, structural mechanics, and labs.

Graduate level programs

Master of Engineering

The nine-month degree program is designed for individuals with a bachelor’s degree in engineering or a closely related field and provides additional technical depth and an educational experience geared to professional practice.

Master of Science

These two-year, research-oriented degree programs are for students wishing to gain an in-depth understanding of an aspect of civil engineering or environmental engineering science and work closely with a faculty member on a research project, which usually forms the basis of the master's thesis. The majority of students who earn this degree stay on to earn a doctoral degree.

Master of Science and MBA

The two-year MIT Leaders for Global Operations program offers both an SM in CEE and an MBA or SM from the MIT Sloan School of Management. LGO's program of study in CEE offers optional tracks in energy and the environment, transportation, supply chain management and general CEE.

Doctoral Degree

The doctoral degree is a research-intensive degree program. Students are expected to select a research project in one of the focal areas of the department and work with faculty to design and complete the research program, leading to the writing of a doctoral thesis. The department offers a joint PhD with the Woods Hole Oceanographic Institute. In addition, the department offers a PhD in Computational Science in Engineering which allows students to specialize at the doctoral level in a computation-related field of their choice through focused coursework and a doctoral thesis.

What can I do with a CEE degree?

Many CEE graduates create startups to commercialize innovations like desalination technologies that provide safe drinking water from oceans. Others join established companies at the forefront of industry and lead new product development. Still others add value to non-profits or governments by helping define better environmental policies or build new city resiliency plans. It is not unusual for students to continue their education or pursue a career in academia, too.

New professional titles include chief innovation officer, chief resiliency officer, environmental data analytics and insight manager, materials chemist, megacities strategist, and head of urban systems engineering.

CEE is supported by the Ralph M. Parsons Laboratory and Henry L. Pierce Laboratory

Parsons Laboratory, Building 48, focuses on what exists as natural systems, and understanding and engineering human adaptation to a changing environment. From its inception as a hydrodynamics laboratory in the 1950s, the lab has evolved into a multidisciplinary research center focused primarily on natural waters and the

environment. Pierce Laboratory, Building 1, advances science and engineering research critical to improving living conditions for humankind, including advancing the innovation of materials, transportation systems, cities, and energy resources.

Contact Information

For more information about undergraduate and graduate programs, or the three minors, please contact the CEE Academic Program Office:

Massachusetts Institute of Technology
Civil and Environmental Engineering Department
77 Massachusetts Ave., Building 1-290
Cambridge, MA 02139
Telephone: (617) 253-9723
Email: cee-apo@mit.edu
Web: <http://cee.mit.edu>

Please see the MIT Course Catalog for further information:

<http://web.mit.edu/catalog/index.html>

© June 2016