

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Graduate Study

Graduate students in the Department of Civil and Environmental Engineering (CEE) participate in research with renowned faculty and get hands-on experience solving some of the world's largest problems in the domains of infrastructure and environment, and related areas of interest. Education takes place inside and outside the classroom, and there are numerous opportunities to learn not only about civil and environmental engineering in an interdisciplinary research environment but also to network with peers. CEE grants the following advanced degrees: Master of Engineering in Civil and Environmental Engineering, Master of Science in Transportation, Master of Science, Civil Engineer, Environmental Engineer, Doctor of Science, and Doctor of Philosophy. The Institute's general requirements for these degrees (<https://catalog.mit.edu/mit/graduate-education>) are described under Graduate Education. Detailed information on the departmental requirements for each degree (<http://cee.mit.edu>) may be obtained on the CEE website.

Admission Requirements

CEE seeks a diverse group of applicants from a range of academic disciplines who will work together to contribute to exciting intellectual networks across the department and Institute. Applicants whose first language is not English are required to submit scores from either the International English Language Testing System (IELTS), the preferred exam, or the Test of English as a Foreign Language (TOEFL). Email the department (cee-admissions@mit.edu) or visit the CEE website (<http://cee.mit.edu>) to learn more about individual graduate programs.

Master of Engineering

The Master of Engineering (MEng) degree program offered by the Department of Civil and Environmental Engineering is a professional-oriented graduate program. The nine-month program consists of high-level, fast-paced coursework and significant engagement with real-world engineering projects. The program prepares graduates to address significant challenges in the domains of civil and environmental engineering through three tracks of study (<https://cee.mit.edu/education/graduate/graduate-degrees>): Climate, Environment, and Sustainability (CES), Data Science for Engineering Systems (DSES), and Structural Mechanics and Design. For current MIT undergraduates, the MEng program is a natural extension of a four-year Bachelor of Science degree, providing for practical experiences and preparing them for emerging fields in today's job market. Graduates are well prepared for a professional career path or further graduate studies at MIT or elsewhere.

Each track requires 66 units of coursework (48 units in Civil and Environmental Engineering subjects) and a 24 unit thesis. Students in the Climate, Environment, and Sustainability track take coursework to develop their understanding of CES and pursue research on CES topics across the breadth of civil and environmental engineering (e.g., ecological systems, air pollution, food, and energy).

Students in the Data Science for Engineering Systems track gain expertise in data science and computational modeling tools for improving the sustainability and resilience of next-generation societal-scale infrastructure systems. Students in this track choose an area of concentration—Computational Modeling and Design for Sustainability or Resilient Infrastructure Systems and Services—and engage in coursework, research, and specialized training that prepares them for careers in sustainable and resilient design of energy systems, materials and structures, supply chains, and urban systems.

Students in the Structural Mechanics and Design track engage in coursework and research in areas including structural engineering mechanics, computational design and optimization, and collaborative workflows at the interface of engineering and architecture.

Students in this MEng program are self-funded, and are responsible for paying tuition and cost-of-living expenses or securing external fellowships.

Master of Science in Civil and Environmental Engineering

The Master of Science in Civil and Environmental Engineering (<https://catalog.mit.edu/degree-charts/master-civil-environmental-engineering>) is a two-year, research-intensive graduate degree designed for students who wish to deepen their expertise in a specialized area of civil and environmental engineering. The program culminates with the completion of a master's thesis, which allows students to engage in original research and contribute new knowledge to the field.

Unlike coursework-only professional master's programs, the SM is structured around close collaboration with a faculty advisor. Students are admitted directly into a research group and matched with a faculty member whose work aligns with their interests and long-term goals. Together, the student and advisor design an individualized academic plan that includes advanced coursework, research activities, and professional development opportunities tailored to the student's aspirations and the focus of the research group.

Graduates of the SM program are well prepared for advanced technical and research positions in industry, government, and academia. The degree also serves as an essential academic and research foundation for students who plan to continue on to doctoral study.

While the Master of Science is most commonly earned en route to a PhD and is not typically considered a terminal degree, there are circumstances in which a standalone SM may be appropriate, such as for students pursuing specialized research interests or for those whose professional objectives do not require doctoral training.

Doctoral Degrees

The Doctor of Philosophy and Doctor of Science degrees in Civil and Environmental Engineering (<https://catalog.mit.edu/degree-charts/phd-civil-environmental-engineering>) are research-centered doctoral programs that provide advanced training across the full spectrum of scholarship represented within the department. Doctoral students develop deep expertise in their chosen area of inquiry while gaining the intellectual flexibility and methodological skills needed to address complex challenges in the natural and built environment.

The program prepares students to generate new knowledge through original research, translate scientific discoveries into engineered solutions, and assume leadership roles in academia, industry, government, and interdisciplinary research settings. Coursework and research emphasize the application of fundamental scientific principles to engineering problems at multiple scales—from molecular processes to global systems.

Doctoral research in the department spans a wide range of focus areas, including but not limited to: environmental chemistry; environmental fluid mechanics; ecology and evolution; hydrology and hydroclimatology; systems engineering, including networks and transportation; and materials, structures, and geomechanics.

Many students enter the doctoral program having previously earned the Master of Science in Civil and Environmental Engineering or a related field. In such cases, coursework completed as part of the SM degree may be applied toward doctoral subject requirements, subject to program guidelines and advisor approval.

The doctoral degree is awarded upon successful completion of all required coursework, formal acceptance and defense of a thesis proposal, and the submission and oral defense of a doctoral thesis that makes a significant and original contribution to the field.

Financial Assistance

The research of the department is an integral part of the graduate program. All doctoral students receive appointments as research or teaching assistants, as do the majority of our SM and MST students. Most of these appointments fully cover tuition, individual health insurance, and reasonable living expenses in the Cambridge area.

Applicants are encouraged to apply for traineeships and fellowships (<http://odg.mit.edu/finances/fellowships>) offered nationally by the National Science Foundation, NASA, DOE, and other governmental agencies that traditionally support students in the department. For an extensive list of such opportunities, visit the Office of Graduate Education website.

Interdisciplinary Programs

Through its interdisciplinary programs, the Department of Civil and Environmental Engineering brings together the science, technology, systems, and management skills necessary to deal with the important engineering problems of the future.

Computational Science and Engineering

MIT offers several interdisciplinary graduate programs in computational science and engineering (<https://catalog.mit.edu/interdisciplinary/graduate-programs/computational-science-engineering>): the Master of Science in Computational Science and Engineering for students interested in the development, analysis, and application of computational approaches to science and engineering; the standalone Doctoral Program in Computational Science and Engineering, which offers specialization in fundamental, methodological aspects of computational science via focused coursework and a thesis; and the Interdisciplinary Doctoral Program in Computational Science and Engineering, which allows students to specialize in a computation-related field of their choice through focused coursework and a thesis through one of the participating host departments in the School of Engineering or School of Science.

Information on these programs is available under Interdisciplinary Graduate Programs (<https://catalog.mit.edu/interdisciplinary/graduate-programs/computational-science-engineering>) and on the Center for Computational Science and Engineering website (<https://cse.mit.edu>).

Graduate Programs in Transportation

MIT provides a broad range of opportunities for transportation-related education. Courses and classes span the School of Engineering, the Sloan School of Management, and the School of Architecture and Planning, with many activities covering interdisciplinary topics that prepare students for future industry, government, or academic careers.

A variety of graduate degrees are available to students interested in transportation studies and research (<https://catalog.mit.edu/interdisciplinary/graduate-programs/transportation>), including a Master of Science in Transportation and PhD in Transportation, described under Interdisciplinary Graduate Programs.

Leaders for Global Operations

The 24-month Leaders for Global Operations (LGO) (<https://catalog.mit.edu/interdisciplinary/graduate-programs/leaders-global-operations>) program combines graduate degrees in engineering and management for those with previous postgraduate work experience and strong undergraduate degrees in a technical field. During the two-year program, students complete a six-month internship at one of LGO's partner companies, where they conduct research that forms the basis of a dual-degree thesis. Students finish the program with two MIT degrees: an MBA (or SM in management) and an SM from one of eight engineering programs, some of which

have optional or required LGO tracks. After graduation, alumni lead strategic initiatives in high-tech, operations, and manufacturing companies.

Joint Program with the Woods Hole Oceanographic Institution

The Joint Program with the Woods Hole Oceanographic Institution (WHOI) (<http://mit.who.edu>) is intended for students whose primary career objective is oceanography or oceanographic engineering. Students divide their academic and research efforts between the campuses of MIT and WHOI. Joint Program students are assigned an MIT or WHOI faculty member as academic advisor; thesis research may be advised by MIT or WHOI faculty. Pre-candidacy, students are typically in residence at MIT. Once they achieve candidacy, they are expected to live near the same campus as their advisor (MIT or WHOI). Students in the applied ocean science and engineering discipline follow a program similar to that of other students in their home department. MIT-WHOI Joint Program students in other disciplines follow the curriculum set out in their discipline's handbook. The program is described in more detail (<https://catalog.mit.edu/interdisciplinary/graduate-programs/joint-program-woods-hole-oceanographic-institution>) under Interdisciplinary Graduate Programs.

Inquiries

Email for detailed information (cee-apo@mit.edu) about academic policies and programs, visit the website (<http://cee.mit.edu>), or visit the Academic Programs Office, Room 1-290, 617-253-9723.