CIVIL AND ENVIRONMENTAL ENGINEERING, M.S.

The mission of the civil and environmental engineering program is to develop leaders in education, industry, government and entrepreneurship who can use their acquired skills to improve society. The academic program provides a comprehensive framework of courses in the broad area of civil and environmental engineering with opportunities to develop specialized expertise. It also emphasizes the development of integrated teamwork abilities, communication, leadership, and creative research skills. Graduate study in the department offers an opportunity to undertake advanced study and research in various areas of specialization. Areas include:

- **Construction engineering and management**: construction engineering and management, sustainable design and construction, and advanced construction and computer modeling
- **Environmental engineering**: water supply, water quality, water treatment, wastewater treatment, solid and hazardous waste management, air pollution, biotechnology, and alternative energy
- **Geo and pavement engineering**: geotechnical, geological and geoenvironmental engineering, pavement materials and design, asphalt binders and mixtures, geosynthetics, in-situ testing and engineering geophysics, recycled materials in sustainable construction
- **Structural engineering**: structural analysis and design of wood, concrete, steel, and highway bridge structures; design for earthquake and wind loading; seismic rehabilitation
- **Transportation engineering**: highway and traffic engineering, intelligent transportation systems, transportation planning, freight, and infrastructure management, transportation safety, user comprehension and behavior, advanced driving- and micro-simulation
- **Water resources/environmental fluid mechanics**: analysis, measurement, modeling of currents, flows, and waves in natural and constructed systems; surface and groundwater hydrology; hydraulic engineering; coastal engineering; sedimentation and transport processes; infrastructure impacts of extreme weather events, hydroecology and stream restoration

Students may also pursue studies in the broad fields of environmental engineering/science and systems analysis. Areas of specialization are organized into a constructed facilities division (including transportation engineering, structural engineering, construction engineering and management, pavement engineering, materials for constructed facilities, and geotechnical engineering) and an environmental engineering division (including geoenvironmental engineering, environmental fluid mechanics and water resources engineering, environmental science and technology, and environmental and water chemistry).

Degrees require a coordinated core program of courses, selected from CEE and other department/program offerings. Graduate degree programs closely associated with the department include human factors, environmental chemistry and technology, water resources management, geological engineering, land resources, and limnology and marine science.

In support of the instructional and research programs are laboratory facilities for highway materials; transportation systems; driving simulation and human factors; soil mechanics and geotechnical engineering; coastal and hydraulic engineering; environmental fluid mechanics; environmental engineering processes and engineering chemistry; structural engineering; geoenvironmental engineering, and geotechnical engineering research. Water resources engineering, environmental engineering, and water chemistry have additional research facilities in the Water Science and Engineering Laboratory on the shore of Lake Mendota. The Environmental Engineering Field Laboratory is located at the Nine-Springs Madison Metropolitan Wastewater Treatment Plant.

FUNDING

Financial support is available through fellowships, project/program assistantships (PA), research assistantships (RA), and teaching assistantships (TA). Applicants apply for financial support when filling out the Graduate School Application Form.

REQUIREMENTS

MINIMUM DEGREE REQUIREMENTS AND SATISFACTORY PROGRESS

To make progress toward a graduate degree, students must meet the Graduate School Minimum Degree Requirements and Satisfactory Progress (http://guide.wisc.edu/graduate/#policiesandrequirementstext) in addition to the requirements of the program.

MASTER’S DEGREES

M.S., M.Eng., with available named option Environmental Engineering

MINIMUM GRADUATE DEGREE CREDIT REQUIREMENT

30 credits

MINIMUM GRADUATE RESIDENCE CREDIT REQUIREMENT

16 credits

MINIMUM GRADUATE COURSEWORK (50%) REQUIREMENT

At least 50% of credits applied toward the graduate degree credit requirement must be completed in graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (http://my.wisc.edu/CourseGuideRedirect/BrowseByTitle).

PRIOR COURSEWORK REQUIREMENTS: GRADUATE WORK FROM OTHER INSTITUTIONS

M.S., M.Eng.: With program approval, students are allowed to count credits of graduate coursework from other institutions. Approved credits will be allowed to count toward the minimum graduate degree credit requirement and the minimum graduate coursework requirement, but will not count toward the minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

M.Eng. named option Environmental Engineering: With program approval, students are allowed to count no more than 6 credits of graduate coursework from other institutions. Approved credits will be allowed to count toward the minimum graduate degree credit requirement and the minimum graduate coursework requirement, but will not count toward the
minimum graduate residence credit requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

**PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNDERGRADUATE**

With program approval, no more than 7 credits of coursework numbered 300 or higher from a UW–Madison undergraduate degree are allowed to count only toward the minimum graduate degree credit requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

**PRIOR COURSEWORK REQUIREMENTS: UW–MADISON UNIVERSITY SPECIAL**

M.S., M.Eng.: With program approval, students are allowed to count up to 15 credits of coursework numbered 300 or above taken as a UW–Madison special student toward the Minimum Graduate Residence Credit Requirement, and the Minimum Graduate Degree Credit Requirement; those courses numbered 700 or above may be applied toward the Minimum Graduate Coursework (50%) Requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

M.Eng. named option Environmental Engineering: With program approval students are allowed to count no more than 9 credits of coursework numbered 300 or above taken as a UW–Madison special student. Coursework earned five or more year prior to admission to a master’s degree is not allowed to satisfy requirements.

**CREDITS PER TERM ALLOWED**

15 credits

**PROGRAM-SPECIFIC COURSES REQUIRED**

Contact the program for information on any additional required courses.

**OVERALL GRADUATE GPA REQUIREMENT**

3.00

**OTHER GRADE REQUIREMENTS**

The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

**PROBATION POLICY**

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

**ADVISOR / COMMITTEE**

Every graduate student is required to have an advisor. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor on a regular basis.

An advisor generally serves as the thesis advisor. In many cases, an advisor is assigned to incoming students. Students can be suspended from the Graduate School if they do not have an advisor. An advisor is a faculty member, or sometimes a committee, from the major department responsible for providing advice regarding graduate studies.

A committee often accomplishes advising for the students in the early stages of their studies.

**ASSESSMENT AND EXAMINATIONS**

Contact the program for information on required assessments and examinations.

**TIME CONSTRAINTS**

Master's degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

**LANGUAGE REQUIREMENTS**

Contact the program for information on any language requirements.

### ADMISSIONS

All applicants must meet the Graduate School's admission requirements (http://grad.wisc.edu/admissions/requirements) to be considered for admission. In addition, applicants must also meet the department's more stringent admission requirements listed below to be considered for admission:

- Grades: A minimum undergraduate grade point average (GPA) of 3.00 (on a 4.00 scale) on the equivalent of the last 60 semester hours (approximately two years of work) is required for domestic applicants. A strong academic performance comparable to an average of B or above grades for all undergraduate course work is required for international applicants.
- Degree: A bachelor's degree from an ABET-accredited engineering program or from a recognized international institution is required. Applicants who do not have a bachelor’s degree as specified above may study for the master of science in civil and environmental engineering (Program Option C); however, to become eligible for this program, applicants must meet the department’s deficiency requirements, some of which may be completed as deficiencies after admission. As a general rule, students with more than 12 credits in deficiencies are not admitted to the graduate program. Rather, they are encouraged to enroll as special students until more of their deficiencies are satisfied. All plans of study within this option must be approved by the department faculty. The deficiency requirements for applicants without a bachelor’s degree from an ABET-accredited engineering program or from a recognized international institution must be obtained from the department.

A complete graduate application is required before an application will be reviewed by the faculty. A complete graduate application contains the following:

- **Graduate School Application Form and application fee**: Applicants must submit an online application to the UW–Madison Graduate School. See Graduate School Admissions (http://grad.wisc.edu/admissions/requirements) to apply.
- **Statement of purpose**: A statement of purpose for graduate study must be submitted through an applicant’s online UW–Madison
Graduate School application. Please limit this important document to 1,000 words.

- **Letters of recommendation**: Three letters of recommendation must be submitted through an applicant's online UW–Madison Graduate School application.

- **Transcripts**: One official transcript from each institution you have attended must be sent to the department directly. International academic records must be in the original language accompanied by an official English translation. Documents must be issued by the institution with the official seal/stamp and an official signature.

- **Graduate Record Examination (GRE) Scores**: Graduate Record Examination (GRE) General Test scores are required for all applicants.

- **English proficiency scores**: Applicants whose native language is not English, or whose undergraduate instruction was not in English, must provide an English proficiency test score. Scores are accepted if they are within two years of the start of the admission term. See Graduate School Admission Requirements (http://grad.wisc.edu/admissions/requirements) for more information on the English proficiency requirement.

Students interested in pursuing the online M.Eng. degree must follow the steps to apply found on the program website (https://epd.wisc.edu/online-degree/environmental-engineering/#/apply).

**LEARNING OUTCOMES**

**KNOWLEDGE AND SKILLS**

- demonstrate a strong understanding of mathematical, scientific, and engineering principles in the field.

- demonstrate an ability to formulate, analyze, and solve advanced engineering problems.

- demonstrate creative, independent problem solving skills.

- apply the latest scientific and technological advancements, advanced techniques, and modern engineering tools to these problems.

**PROFESSIONAL CONDUCT**

- fosters ethical and professional conduct.

**PEOPLE**

**Faculty:** Professors Noyce (chair), Adams, Bahia, Cramer, Feigl, Hanna, Harrington, Holloway, Hurley, Karthikeyan, Lee, Likos, Long, Noguera, McMahon, Park, Parra-Montesinos, Pedersen, Potter, Ran, Russell, Schauer, Wu; Associate Professors Ahn, Fratta, Loheide II, Pincheira Tinjum; Assistant Professors Block, Ginder-Vogel, Hedegaard, Hicks, Remucal, Sone, Wright. See also CEE faculty (http://directory.engr.wisc.edu/cee/faculty).

**Geological Engineering Faculty:** Professors Likos (chair) (Civil and Environmental Engineering), Anderson (Geoscience), Bahr (Geoscience), Goodwin (Geoscience), Thurber (Geology and Geoscience), Tikoff (Geoscience), Tobin (Geoscience), Wang (Geoscience), Wu (Civil and Environmental Engineering), Feigl (Geoscience); Associate Professors Fratta (Civil and Environmental Engineering), Loheide (Civil and Environmental Engineering); Assistant Professors Cardiff (Geoscience), Tinjum (Engineering Professional Development) Ginder-vogel (Civil and Environmental Engineering), Sone (Civil and Environmental Engineering), Affiliate Professors Kung (Soil Science), Lowery (Soil Science), Plesha (Engineering Physics), Potter (Civil and Environmental Engineering). See also GLE faculty (http://gle.wisc.edu/faculty-and-staff).