Civil Engineering (CIEN)

Interim Chairperson: Daniel Zitomer Ph.D., P.E.
Civil Engineering Graduate Programs website (http://www.marquette.edu/engineering/civil_environmental/grad.shtml)

Degrees Offered
Master of Science; Doctor of Philosophy

Mission Statement
The mission of the Department of Civil, Construction and Environmental Engineering is to educate students in the Catholic, Jesuit tradition. These students will be competent in their technical fields, appreciate the moral and ethical impact of their professional work, and continue their professional development throughout their careers. They will advance the state of technical and scientific knowledge through research and provide service to civic and professional communities.

Program Descriptions
The master of science and doctor of philosophy degree programs are designed to provide graduate students with both broad fundamental knowledge and up-to-date information on current and emerging technologies. Students may enroll on either a full-time or part-time basis. Doctoral students and research-oriented master’s students (e.g., Plan A) engage in research activities under the close supervision of their advisers, gradually learning to become independent researchers. Their projects are often supported by government and industry grants. Courses and research projects make significant use of the department’s extensive laboratory and computational facilities. Graduates find employment in industry, government, academia and research laboratories.

Prerequisites for Admission
Applicants should have graduated with, or be about to graduate with, a baccalaureate degree in an appropriate area of study from an accredited institution. In addition, doctoral applicants are required to have earned a master's degree in a related field. (In some instances, exceptional applicants may be considered for entry into the doctoral program without a master's degree.)

Application Requirements
Applicants must submit, directly to the Graduate School:

1. A completed application form and fee online (http://marquette.edu/grad/future_apply.shtml).
2. Copies of all college/university transcripts except Marquette.*
3. Three letters of recommendation.
4. (For international applicants only) a TOEFL score or other acceptable proof of English proficiency.
5. (For doctoral and all international applicants) GRE scores (General Test only).
6. The GRE is recommended for, and may be requested of, master’s applicants with undergraduate grade point averages less than 3.000 out of 4.000.
7. (For doctoral applicants only) a brief statement of purpose.
8. (For doctoral applicants only) submission of any English-language publications authored by the applicant is optional, but strongly recommended; this includes any master’s thesis or essay that the applicant may have written.

Upon admission, final official transcripts from all previously attended colleges/universities, with certified English translations if original language is not English, must be submitted to the Graduate School within the first five weeks of the term of admission or a hold preventing registration for future terms will be placed on the student’s record.

Research Activities
The Department of Civil, Construction and Environmental Engineering maintains laboratories related to studies in hydraulics, environmental engineering, engineering materials (including soils) and structural testing, as well as computational facilities. The Water Quality Center, the Transportation Research Center, and the Engineering Materials and Structural Testing Laboratory are associated with the department.

Research interests of the faculty include: retrofit and repair of structures using fiber-reinforced polymers, prestressed concrete, steel building systems, application of evolutionary computation and optimization algorithms in structural engineering, reliability-based performance assessment of civil infrastructure, health monitoring of civil infrastructure, performance-based engineering, ground motion simulation validation, climate change mitigation and adaptation, sustainable and resilient infrastructure, microcantilever-based sensors, computer applications in construction, lean construction practices, management of construction processes, modeling of construction projects, virtual design and construction, work-zone capacity and safety, safety impacts of pavement surface textures, effects of grinding on PCC pavements, pavement performance inputs for life-cycle cost analysis, human factors, traffic accident relations with roadway geometry, effect of heavy vehicles on freeway operations, traffic control device evaluation, finite element
Civil Engineering Master's Requirements

Specializations: Construction Engineering (CNEN), Environmental and Water Resources Engineering (ENWR), Structural Engineering and Structural Mechanics (SESM), Transportation Engineering and Materials (TEMA)

Students may earn a master's degree under either Plan A (thesis) or Plan B (non-thesis). Regardless of the option chosen, at least one-half of the total course work requirement must be taken at the 6000-level. In most cases, master's students are admitted to the program under Plan B but may transfer to Plan A with permission from their adviser. Note: Recipients of teaching or research assistantships are strongly encouraged to pursue Plan A (thesis option).

Plan A requires the student to complete 30 credit hours (24 hours of course work, 6 hours of thesis work), submit an approved thesis, and pass a final oral comprehensive examination (thesis defense). The comprehensive exam for Plan A is focused mainly on the student’s thesis topic.

Under the Plan B option, students must complete 30 credit hours of course work and pass a final comprehensive examination. The comprehensive exam for Plan B is usually an oral exam, administered by the student’s three-person master’s committee. The scope of the Plan B comprehensive exam may span the student’s entire body of course work.

Both Plans A and B require that at least 18 credit hours be from the Department of Civil, Construction and Environmental Engineering course offerings.

Accelerated Bachelor's-Master's Degree Program

The department offers a five-year combined bachelor’s-master’s program available to outstanding Marquette University undergraduate students. This program enables students to earn both their bachelor of science and master of science degrees in civil engineering in just five years. Students currently enrolled in the undergraduate program in civil and environmental engineering at Marquette University (with a GPA of 3.500 or above) may apply for admission to the five-year program during their junior year. Students must submit an application to the Graduate School, indicate their interest in the five-year program and meet all other admission criteria as stated in the Application Requirements section.

In addition to completing their undergraduate degree requirements, students will take master’s level courses in their senior year. (Note: No course is permitted to satisfy both the undergraduate and graduate degree requirements in the accelerated B.S.-M.S. program of the Department of Civil, Construction and Environmental Engineering.) The remaining master’s level course work is taken during the student’s fifth year. If students pursue Plan A (thesis option), work on the thesis research should begin the summer between the junior and senior years. Students will continue to gain research experience during the summer between the senior and fifth years, continuing throughout the fifth year and culminating in preparation of a written thesis and defense. Students are also permitted to follow Plan B (course work option), which may also be designed so that the combined bachelor’s-master’s program may be completed in five years.

Civil Engineering Doctoral Requirements

Specializations: Construction Engineering (CNEN), Environmental and Water Resources Engineering (ENWR), Structural Engineering and Structural Mechanics (SESM), Transportation Engineering and Materials (TEMA)

A doctoral student must complete a program of study prepared in consultation with his or her doctoral adviser and outlined on an approved Doctoral Program Planning Form. This form must be submitted within the first year of the student’s doctoral studies. The program normally requires a minimum of 45 credit hours of course work beyond the baccalaureate degree plus 12 credit hours of dissertation work. In cases in which the student enters the program with a master’s degree in civil engineering or a closely related field, the student may request that the department and the Graduate School allow credits from the master’s degree to satisfy up to 21 credit hours of the required course work. Thus, a minimum of 24 credit hours of course work exclusive of the dissertation must be taken at Marquette University while the student is in the doctoral program. The student must also pass a doctoral qualifying examination (DQE) and submit and successfully defend a dissertation.

The DQE normally consists of both written and oral tests and is administered after the student has completed 30 to 36 credit hours of graduate study (inclusive of any approved credit hours from a previous master’s degree). Each faculty member on a doctoral candidate’s committee may submit questions for the written examination. The doctoral committee, as a whole, gives the oral examination.

The dissertation must represent an original research contribution showing high attainment and clear ability to do independent research. A public defense of the dissertation (the final oral examination) is administered after the student has completed all other formal requirements for the doctoral degree.