

# CIVIL ENGINEERING (M.S.)

The civil engineering graduate program at Wayne State University is designed to accommodate the needs of both full-time on-campus students and part-time students concurrently employed by local industry or government. To this end, many of the graduate classes are held in the evening. Full-time students have the opportunity to participate in research and experimental work with the faculty, while pursuing their graduate courses.

## Admission Requirements

Admission to this program is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). Additionally, all applicants must satisfy the following:

1. The student must have earned a Bachelor of Science (or Bachelor of Engineering) degree. The undergraduate degree should be from an Accrediting Board for Engineering and Technology (ABET) institution or from a comparable foreign institution. In the event that the undergraduate degree is from a field other than civil engineering or from a non-ABET accredited institution, the student may be required to complete a set of prerequisite undergraduate courses before graduate degree credit may be accrued
2. The student must have an overall grade point average (g.p.a.) of 3.2 for regular admission. Qualified or probationary admission may be granted to students with a lower g.p.a. Conditions of such admissions are specifically mandated and applicants should contact the Department for details.

## Program Requirements

The Master of Science is offered by this department under the following options:

**Plan A:** Thirty credits including a six-credit thesis.

**Plan C:** Thirty credits of coursework.

For either plan, credits must be distributed as follows: at least twenty-four credits must be taken in Civil Engineering (CE) designated courses. There must be two courses numbered 7000-8999. Students must select a concentration from one of the following areas: construction engineering management, environmental engineering, geotechnical engineering, structural and materials engineering, and transportation engineering.

Students may elect to pursue a dual concentration option. For this option, students must satisfy the concentration requirements for each individual concentration. Courses completed may not be applied to more than one concentration.

Students must maintain a grade of 'B' or better in all core courses. The credit distribution requirements do not include thesis credit for Plan A candidates.

Within the first twelve credits of graduate work, the student should file an advisor-approved Plan of Work. All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the James and Patricia Anderson College of Engineering (<http://bulletins.wayne.edu/graduate/college-engineering/academic-regulations/>).

M.S. students may take a maximum of three credits of CE 7990 and a maximum of three credits of CE 7996. Registration in CE 7990 and/or

CE 7996 must be approved by a faculty advisor and the graduate program director.

## Construction Engineering Management Concentration Requirements

Code	Title	Credits
<b>Core courses - Choose a minimum of four courses from the following list:</b>		
CE 6010	Advanced Construction Engineering and Management	3
CE 6050	Construction Cost Estimating	3
CE 6060	Construction Techniques and Methods	3
CE 6880	Building Information Modeling (BIM)	3
CE 7020	Construction Safety	3
CE 7830	Construction Planning and Scheduling	3
CE 7860	Construction Accounting and Financial Management	3

### Elective courses 18

Elective requirements may be completed via other CE-designated courses. A maximum of 6 credit hours of electives may be completed outside Civil Engineering and must be approved by the faculty advisor and the graduate program director. Students must complete a minimum of 24 CE-designated credits between their core and elective courses.

## Environmental Engineering Concentration Requirements

Code	Title	Credits
<b>Core courses - Choose a minimum of four courses from the following list:</b>		
CE 5220	Environmental Chemistry	3
CE 5240	Air Pollution Engineering	3
or CE 7240	Advanced Air Pollution Engineering	
CE 6130	Open Channel Hydraulics	3
CE 6150	Hydrologic Analysis and Design	3
CE 7270	Big Data Applications in Environmental Engineering	3
CE 7280	Applied Environmental Microbiology	3
<b>Elective courses</b>		<b>18</b>

Elective requirements may be completed via other CE-designated courses. A maximum of 6 credit hours of electives may be completed outside Civil Engineering and must be approved by the faculty advisor and the graduate program director. Students must complete a minimum of 24 CE-designated credits between their core and elective courses.

## Geotechnical Engineering Concentration Requirements

Code	Title	Credits
<b>Core courses - Complete both courses listed below:</b>		
CE 5510	Geotechnical Engineering I	4
CE 5520	Geotechnical Engineering II	3
<b>Elective courses</b>		<b>23</b>

Elective requirements may be completed via other CE-designated courses. A maximum of 6 credit hours of electives may be completed outside Civil Engineering and must be approved by the faculty advisor and the graduate program director. Students must complete a minimum of 24 CE-designated credits between their core and elective courses.

## Structural and Materials Engineering Concentration Requirements

Code	Title	Credits
<b>Core courses - Choose a minimum of five courses from the following list:</b>		
CE 5370	Finite Element Analysis Fundamentals	3
CE 5390	Design of Prestressed Concrete Structures	3
or CE 7395	Advanced Design of Prestressed Concrete Structures	
CE 6340	Bridge Design and Evaluation	3
CE 6370	Advanced Reinforced Concrete Design	3
CE 6410	Advanced Steel Design	3
CE 7070	Risk and Reliability in Civil Engineering	3
CE 7300	Advanced Structural Mechanics	3
CE 7385	Advanced Topics in Reinforced Concrete Design	3
CE 7460	Advanced Composite Materials for Civil Infrastructure	3

### Elective courses 15

Elective requirements may be completed via other CE-designated courses. A maximum of 6 credit hours of electives may be completed outside Civil Engineering and must be approved by the faculty advisor and the graduate program director. Students must complete a minimum of 24 CE-designated credits between their core and elective courses.

## Transportation Engineering Concentration Requirements

Code	Title	Credits
<b>Core courses - Choose a minimum of four courses from the following list:</b>		
CE 5370	Finite Element Analysis Fundamentals	3
CE 5610	Advanced Highway Design	3
CE 5640	Advanced Transportation Systems Design and Operation	3
CE 6660	Pavement Asset Management	3
CE 7080	Advanced Causal Inference for Engineers and Planners	3
CE 7630	Urban Transportation Planning	3

### Elective courses 18

Elective requirements may be completed via other CE-designated courses. A maximum of 6 credit hours of electives may be completed outside Civil Engineering and must be approved by the faculty advisor and the graduate program director. Students must complete a minimum of 24 CE-designated credits between their core and elective courses.