

MASTER OF ENGINEERING IN Civil Engineering

Civil and environmental engineers are responsible for providing the world's constructed facilities and the infrastructure on which modern civilization depends. These facilities can be large and complex and require that the engineer be broadly trained and able to deal with the latest technologies.

Civil and environmental engineers focus on the analysis, design, construction, maintenance, and operation of large-scale physical systems. To ensure the proper construction and care of these complex systems and environments, Rensselaer civil and environmental engineers develop a full range of skills in design, analysis, fabrication, communication, management, and teamwork. The current rebuilding of the world's roads, bridges, water, and sewer systems, and other physical facilities has heightened society's awareness of the profession and given it added prominence. The growing panoply of sensors, instrumentation, intelligent facilities, and new materials is also highlighting the high-tech character of the discipline; creating new educational challenges and redefining the skill set that civil and environmental engineers need to succeed. At Rensselaer, civil engineering has a long and distinguished history. In 1835, the Institute became the first U.S. school to issue a civil engineering degree.

ADMISSION REQUIREMENTS

- Bachelor of Science degree in engineering or the physical or natural sciences from an accredited undergraduate institution
- Undergraduate GPA of 3.0 or higher
- Grades of "B" or better in courses completed since bachelor's degree
- GRE General Test is required
- TOEFL general test is required for international students
- Completed application form
- Official transcripts for all undergraduate and graduate work
- Statement of background and goals as it applies to the program
- Two letters of recommendation
- Resume

GRADUATION REQUIREMENTS

- Matriculated status
- Approved Plan of Study and worksheet
- At least 15 credits must be at the 6000 level
- At least 21 credits must be from Civil Engineering
- Minimum 3.0 GPA; minimum 30 credits

PLAN OF STUDY

(minimum of 30 credit hours, must also conform to the graduation requirements)

Concentration Areas: Select one area of concentration

1. Geotechnical/Earthquake Engineering
2. Structural/Earthquake Engineering
3. Transportation

I. Core Courses (15-18 credits)

Geotechnical/ Earthquake Engineering

CIVL-6510	Advanced Soil Mechanics
CIVL-6520	Advanced Foundations of Earth Structures
CIVL-6550	Advanced Geoenvironmental Engineering
CIVL-6450	Structural Dynamics
CIVL-6540	Dynamics of Soil and Soil Foundation Systems

Structural/Earthquake Engineering

CIVL-4240	Introduction to Finite Elements
CIVL-6200	Plates and Shells
CIVL-6210	Structural Stability
CIVL-6310	Advanced Concrete Structures
CIVL-6450	Structural Dynamics
CIVL-6540	Dynamics of Soil and Soil Foundation Systems

II. Elective Courses (12-15 credits)

CIVL-6170	Mechanics of Solids
CIVL-6480	Designing with Geosynthetics
CIVL-6490	Earthquake Engineering
CIVL-6530	Seepage, Drainage, and Groundwater
CIVL-6660	Fundamentals of Finite Elements
CIVL-6670	Nonlinear Finite Element Methods
CIVL-6680	Finite Element Programming

I. Core Courses (12 credits)

Transportation Engineering

CIVL-6230	Transportation Economics
CIVL-6250	Transportation Systems Planning
One 4000 or 6000 Level Statistics or Operations Research/Optimization Course	
One Graduate Level Free Elective	

II. Elective Courses (18 credits)

CIVL-4620	Mass Transit Systems
CIVL-4640	Transportation Facility Design and Planning
CIVL-4660	Traffic Engineering
CIVL-4670	Highway Engineering
CIVL-6270	Traffic Control Systems
CIVL-6280	Traffic Flow Theory
CIVL-6260	Transportation Algorithms
CIVL-6960	Intelligent Transportation Systems
CIVL-6961	Critical Issues in Transportation
CIVL-6961	Dynamic Transportation Modeling

NOTES:

Students interested in applying for a research-oriented M.S. degree should notify their faculty adviser for details on curriculum and graduation requirements.

Some elective courses can be taken in departments other than civil engineering. For example: Mathematics, Earth Sciences and Environmental Engineering. M.S. candidates typically take all the courses listed in their chosen area of concentration.