

# Civil & Environmental Engineering

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## Vision Statement

The Civil and Environmental Engineering Department will be nationally recognized for producing leaders in the fields of civil and environmental engineering.

The Civil and Environmental Engineering Department will continue to develop and enrich the educational experience of its students. This is accomplished by providing specialized courses in a variety of sub-disciplines such as structural, environmental, geotechnical, transportation, and water resources engineering. This objective is also accomplished through the Master's degree programs in civil engineering, construction management, and environmental engineering and the strong research programs at both the undergraduate and graduate levels which provide unique opportunity for enrichment of student experience. Students pursuing a master's degree in environmental may choose between an M.E. and an M.S. degree

## Program Educational Objectives

Graduates of the undergraduate Civil Engineering program will be recognized for their:

- Technical skills in civil & environmental engineering
- Ethical practices and moral character
- Leadership, achievement, and involvement in engineering and engineering-related professions
- Dedication to furthering the engineering profession through continuous self-improvement
- Commitment to engineering as a service-to-humanity profession through practicing sustainable engineering for New York and the world.

## Student Outcomes

The Civil Engineering program uses the standard set of ABET, Inc., Student Outcomes (1) through (7) as described above under Engineering.

## Civil Engineering Program

### Mission Statement

The mission of the undergraduate Civil Engineering program is to develop an educational plan for each of our students so upon graduation they are prepared to continue their graduate studies or enter into the civil engineering profession.

The goal is to prepare students to function professionally as responsible members of the global engineering community dedicated to life-long learning and collaborative practice,

discovery and sharing a breadth of knowledge. The program puts particular emphasis on introducing the students to the broad range of civil engineering disciplines.

Civil engineers use mathematics, along with the basic sciences and engineering sciences, in the study of the structural, geotechnical, transportation, environmental, and water resources engineering disciplines. These disciplines allow a civil engineer, working to improve the environment, to plan, design and construct the industrial plants of the world, the great public works, the housing, the bases for space exploration and the transportation networks.

Structural engineering deals with the analysis, design and construction of buildings, bridges, ships, aircraft, and other structures. Environmental engineering allows a civil engineer to analyze and model the environment, assess the effects of human activities on it, and design control facilities to ensure improvement and protection of environmental resources. Geotechnical engineering focuses on soil behavior and the subsequent design of adequate supports for all structures resting on the earth. Transportation engineering emphasizes the planning, design, and construction of efficient transportation infrastructure such as highways, airports, railways, seaports, and public transport. Water resources engineering focuses on water usage and distribution across networks as well as the design and construction of infrastructure that control bodies of water, such as rivers, lakes, reservoirs, and oceans.

Students obtain strong technical knowledge by taking at least two required courses in each of the above disciplines. Students also choose from a wide range of elective courses, where they can concentrate on specific topics in their areas of interest.

All undergraduate students in the department pursue a four-year degree in civil engineering. The program also accommodates students who wish to pursue a minor in environmental engineering, in addition to their civil engineering major.

## Four-Year Program in Civil Engineering

The curriculum for the first year is common for all the majors in engineering. Students take the foundational courses in the sophomore year. The junior and senior years allow for concentrated studies in the areas of structural, environmental, geotechnical, transportation, and water resources engineering. A representative program is shown below.

### First Year

Fall	Credits	Spring	Credits
MATH 185 <sup>1</sup>		3 MATH 186 <sup>1</sup>	3
CHEM 101/103 or PHYS 101/191 <sup>1</sup>		4 CHEM 101/103 or PHYS 101/191	4
ENGS 115		3 ENGS 116	3
ENGL 110 or RELS 110		3 General Education Elective	3
General Education Elective		3 ENGL 110 or RELS 110	3
	<b>16</b>		<b>16</b>

**Second Year**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
MATH 285 <sup>1</sup>		3 MATH 286 <sup>1</sup>	3
CHEM 102/CHEM104 <sup>1</sup>		4 PHYS 102/PHYS 192 <sup>1</sup>	4
		ENGS 230 <sup>1-5</sup>	3
ENGS 204 <sup>1</sup>		3 CIVL 201 <sup>1</sup>	
ENGS 206 <sup>1-5</sup>		3 or CIVL 202 <sup>1</sup>	3
CIVL 201 <sup>1</sup>		Approved Science Elective <sup>2</sup>	3
or CIVL 202 <sup>1</sup>			
Approved Science Elective <sup>2</sup>		-	
		<b>16</b>	<b>16</b>

**Third Year**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CEEN 303 <sup>1-4</sup>		3 CEEN 307 <sup>1</sup>	3
CEEN 304		1 CEEN 308	3
CIVL 302 <sup>1-4</sup>		3 CIVL 309 <sup>1</sup>	3
CEEN 314		3 CIVL 310 <sup>1-4</sup>	3
CIVL 305 <sup>1</sup>		3 CIVL 311	1
CIVL 306		3 CIVL 312 <sup>1</sup>	3
		<b>16</b>	<b>16</b>

**Fourth Year**

<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CIVL 406 or ENVL 406 <sup>6</sup>		3 CIVL 411 or ENVL 408	3
CIVL 410 or ENVG 507 <sup>6</sup>		3 CIVL 412	3
CIVL 409 <sup>6,7</sup>		3 CIVL/ENVL Elective	3
CIVL/ENVL Elective		3 CIVL/ENVL Elective	3
General Education Elective <sup>4</sup>		3 General Education Elective <sup>4</sup>	3
RELS Catholic Studies or RELS Contemporary/Global Studies		3 RELS Catholic Studies or RELS Contemporary/Global Studies	3
		<b>18</b>	<b>18</b>

**Total Credits: 132**

- <sup>1</sup> These **courses must be passed with a grade of C (2.0) or better.**
- <sup>2</sup> Students are required to take **one** approved science elective in their sophomore or second year of the program. They may take this class either in the fall or in the spring semester. Approved science electives are: BIOL 222 Biology for Engineers, together with BIOL 224 BiologyForEngineers Laboratory; and SCI 301 Earth Science for Engineers.
- <sup>3</sup> Students are not allowed to enroll in any junior level or third year courses before completing all **prerequisite** mathematics, science and engineering science courses.
- <sup>4</sup> Every civil engineering student is required to take an approved course in the Manhattan College School of Business. This course will substitute for one general education course.

5 Students are not allowed to repeat the course more than three times. Failure to successfully complete the course in three attempts will lead to dismissal from the program.

6 *The student must pass these courses with a grade of C (2.0) or better to enroll in CIVL 411 and/or ENVL 408.*

7 **The C requirement is waived for students in the environmental concentration.**

## Environmental Engineering Minor within Civil Engineering

An environmental engineering minor is available for students within the Civil & Environmental Engineering Department. All Civil Engineering students follow the same curriculum for the first three years. For those pursuing a minor in Environmental Engineering, the following sequence is recommended for the fourth year. The required classes are the capstone design sequence (ENVL 406/ENVL 408) in Water Treatment / Environmental Engineering Design and either Geoenvironmental Engineering (CIVG 501) or Groundwater (ENVG 507). In addition, there are three environmental engineering electives.

### Senior

Fall	Credits	Spring	Credits
ENVL 406		3 ENVL 408 (Environmental Engineering Design)	3
CIVG 501 or ENVG 507		3 CIVL 412 (Highway Design)	3
CIVL 409 (Reinforced Concrete) <sup>7</sup>		3 Environmental Elective*	3
Environmental Elective*		3 Environmental Elective*	3
RELS Elective		3 RELS Elective	3
General Education Elective		3 General Education Elective	3
		<b>18</b>	<b>18</b>

### Total Credits: 36

\*Environmental electives are selected in consultation with the Environmental Engineering Graduate Program Director in the Civil & Environmental Engineering Department. Students who wish to enroll in the EAC of ABET accredited M.E. program (see below) must take one science course (currently, either Biology or Earth Science) as one of their Environmental Electives.

**Completion of the Environmental Engineering Minor allows students entry into the EAC of ABET Accredited Masters of Engineering (M.E.) Graduate Program provided they have a cumulative G.P.A. of 3.0.**

In addition, there are numerous opportunities for partial or full financial support for graduate studies including:

- Graduate Internships
- Graduate Fellowships

- Graduate Research Assistantships (GRAs)
- Graduate Laboratory Assistants (GLAs)

## **Fundamentals of Engineering Examination-- Civil & Environmental Engineering Department**

All students must take the Fundamentals of Engineering (FE) examination in their fourth year as a requirement to graduate from the program. While students are not required to pass the FE exam, they are required to take the FE exam and document that they have completed the requirement.