

# CIVIL ENGINEERING, MASTER OF CIVIL ENGINEERING

The Master of Civil Engineering is a ten-course master's degree designed to equip professionals working in the field of civil engineering with up-to-date knowledge and skills necessary for designing and maintaining the structures and infrastructure systems that make up our built environment in the face of evolving demands and constraints. With a diverse suite of graduate courses, students may choose to focus their degree in the areas of geotechnical engineering, ocean & coastal engineering, or structural engineering, or they may tailor a general civil engineering program to meet their specific needs. Courses are taught primarily online and virtual live (VL), with a few courses offered in person on the Homewood Campus.

## Admission Requirements

Applicants (degree seeking and special student) must meet the general requirements for admission to graduate study as outlined in the Admission Requirements (<https://e-catalogue.jhu.edu/engineering/engineering-professionals/admission-requirements/>). The applicant's prior education must include a degree in civil engineering or a closely related technical discipline. Admitted students typically have earned a grade point average of at least 3.0 on a 4.0 scale (B or above) in the latter half of their undergraduate studies. Transcripts from all college studies must be submitted. When reviewing an application, the candidate's academic and professional background will be considered.

Applicants with a degree in a field closely related to civil engineering may be accepted to the program provided they demonstrate the successful completion of coursework from a regionally accredited institution including: Calculus I, Calculus II, Linear Algebra and Differential Equations, Physics I, Statics, Mechanics of Materials, Theory of Structures, Soil Mechanics, and Structural Design in Steel and Reinforced Concrete. Applicants whose prior education does not include the prerequisites listed may be accepted to the program with provisional status, followed by full admission status once they have completed the missing prerequisites.

## Program Requirements

Ten courses must be completed within five years. Students may either pursue a general civil engineering course of study or choose to focus their studies in one of three areas: structural engineering, geotechnical engineering, or ocean and coastal engineering. A focus area is not required for this program and will not appear as an official designation on a student's transcript or diploma. Rather, each focus area contains a unique list of elective courses designed to guide students through the program so they are prepared for professional advancement in one of these specific fields after graduation. The courses required for each of the programs are listed below; any deviations from these requirements must be approved by the program chair. A maximum of one course may be selected from the Engineering Management program.

### Program options

Code	Title	Credits
	General Civil Engineering Program (p. 1)	
<b>Focus Areas</b>		
	Structural Engineering (p. 1)	

Geotechnical Engineering (p. 2)

Ocean and Coastal Engineering (p. 2)

## Courses

### General Civil Engineering

Code	Title	Credits
<b>Core Courses</b>		
Three core courses are required:		
EN.535.641	Mathematical Methods For Engineers	3
EN.565.604	Structural Mechanics	3
EN.565.606	Geotechnical Engineering Principles	3
<b>Electives</b>		
Select at least four elective courses from the following: <sup>1</sup>		
EN.565.608	BIM Applications in Civil Engineering	3
EN.565.616	Applied Finite Element Methods	3
EN.565.619	Advanced Structural Analysis	3
EN.565.620	Advanced Steel Design	3
EN.565.622	Advanced Reinforced Concrete Design	3
EN.565.623	Bridge Design and Evaluation	3
EN.565.626	Design of Wood Structures	3
EN.565.628	Preservation Engineering I: Theory and Practice	3
EN.565.630	Prestressed Concrete Design	3
EN.565.631	Preservation Engineering II: Theory & Practice	3
EN.565.633	Investigation, Diagnosis, and Rehabilitation	3
EN.565.636	Lateral Forces: Analysis and Design of Building Structures	3
EN.565.637	Preservation Engineering in the Urban Context	3
EN.565.658	Natural Disaster Risk Modeling	3
EN.565.664	Advanced Foundation Design	3
EN.565.680	Marine Geotechnical Engineering	3
EN.565.682	Design of Ocean Structures	3
EN.565.684	Port & Harbor Engineering	3
EN.565.686	Sustainable Coastal Engineering	3
EN.565.731	Structural Dynamics	3
EN.565.732	Earthquake Engineering	3
EN.565.734	Wind Engineering	3
EN.565.736	Structural Fire Engineering	3
EN.565.740	Structural Stability	3
EN.565.762	Ground Improvement Methods	3
EN.565.764	Retaining Structures and Slope Stability	3
EN.565.800	Independent Study in Civil Engineering	3
EN.565.801	Independent Study in Civil Engineering	3
1. Of the remaining three courses, a minimum of two must be fulfilled by elective courses in any of the civil engineering program's focus areas, and a maximum of one course may be fulfilled by a course outside of the elective courses in any of the civil engineering program's focus areas.		

### Structural Engineering Focus Area

Code	Title	Credits
<b>Core Courses</b>		
Two core courses are required:		
EN.565.604	Structural Mechanics	3

EN.535.641	Mathematical Methods For Engineers	3
<b>Electives</b>		
Select at least four elective courses from the following: <sup>2</sup>		
EN.565.608	BIM Applications in Civil Engineering	3
EN.565.616	Applied Finite Element Methods	3
EN.565.619	Advanced Structural Analysis	3
EN.565.620	Advanced Steel Design	3
EN.565.622	Advanced Reinforced Concrete Design	3
EN.565.623	Bridge Design and Evaluation	3
EN.565.626	Design of Wood Structures	3
EN.565.628	Preservation Engineering I: Theory and Practice	3
EN.565.630	Prestressed Concrete Design	3
EN.565.631	Preservation Engineering II: Theory & Practice	3
EN.565.633	Investigation, Diagnosis, and Rehabilitation	3
EN.565.636	Lateral Forces: Analysis and Design of Building Structures	3
EN.565.637	Preservation Engineering in the Urban Context	3
EN.565.682	Design of Ocean Structures	3
EN.565.731	Structural Dynamics	3
EN.565.732	Earthquake Engineering	3
EN.565.734	Wind Engineering	3
EN.565.736	Structural Fire Engineering	3
EN.565.740	Structural Stability	3
2. Of the remaining four courses, a minimum of three must be fulfilled by elective courses in any of the civil engineering program's focus areas, and a maximum of one course may be fulfilled by a course outside of the elective courses in any of the civil engineering program's focus areas.		

## Geotechnical Engineering Focus Area

Code	Title	Credits
<b>Core Courses</b>		
Two core courses are required:		
EN.565.606	Geotechnical Engineering Principles	3
EN.535.641	Mathematical Methods For Engineers	3
<b>Electives</b>		
Select at least four elective courses from the following: <sup>2</sup>		
EN.565.664	Advanced Foundation Design	3
EN.565.680	Marine Geotechnical Engineering	3
EN.565.762	Ground Improvement Methods	3
EN.565.764	Retaining Structures and Slope Stability	3
EN.575.626	Hydrogeology	3
EN.575.629	Modeling Contaminant Migration through Multimedia Systems	3
EN.575.640	Geographic Information Systems (GIS) and Remote Sensing for Environmental Applications	3
EN.575.703	Environmental Biotechnology	3
2. Of the remaining four courses, a minimum of three must be fulfilled by elective courses in any of the civil engineering program's focus areas, and a maximum of one course may be fulfilled by a course outside of the elective courses in any of the civil engineering program's focus areas.		

## Ocean and Coastal Engineering Focus Area

Code	Title	Credits
<b>Core Courses</b>		
Two core courses are required:		
EN.565.682	Design of Ocean Structures	3
EN.535.641	Mathematical Methods For Engineers	3
<b>Electives</b>		
Select at least four elective courses from the following: <sup>2</sup>		
EN.535.621	Intermediate Fluid Dynamics	3
EN.565.658	Natural Disaster Risk Modeling	3
EN.565.680	Marine Geotechnical Engineering	3
EN.565.684	Port & Harbor Engineering	3
EN.565.686	Sustainable Coastal Engineering	3
EN.575.708	Open Channel Hydraulics	3
EN.575.717	Hydrology	3
EN.575.728	Sediment Transport and River Mechanics	3
EN.565.734	Wind Engineering	3
2. Of the remaining four courses, a minimum of three must be fulfilled by elective courses in any of the civil engineering program's focus areas, and a maximum of one course may be fulfilled by a course outside of the elective courses in any of the civil engineering program's focus areas.		

Please refer to the course schedule ([ep.jhu.edu/schedule](https://ep.jhu.edu/schedule) (<https://apps.ep.jhu.edu/schedule/search/>)) published each term for exact dates, times, locations, fees, and instructors.