Civil Engineering with Concentration in Water, Environmental, and Coastal Systems, MSCivE (Boston)

This program integrates the study of infrastructure; hydrology; hydraulics; engineering for coastal areas; numerical modeling; remote sensing; spatial and temporal data analysis; and physical, chemical, and biological processes that impact the water and air quality to provide students with the knowledge and tools for developing and managing sustainable, resilient water resources and infrastructure. It includes required core courses from the Department of Civil and Environmental Engineering (https://cee.northeastern.edu/academics/graduate-studies/ms-cive/), complemented by electives in electrical and computer engineering, mechanical and industrial engineering, and earth and environmental sciences.

Degree Requirements	With Project	With Thesis	Coursework Only
Required core courses	8 SH	8 SH	8 SH
Restricted electives	12 SH	12 SH	12 SH
Other electives	8 SH	4 SH	12 SH
Master of Science report/thesis	4 SH	8 SH	
Minimum semester hours required	**32 SH**	**32 SH**	**32 SH**

Graduate Certificate Options

Students enrolled in a master's degree have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (https://catalog.northeastern.edu/graduate/engineering/graduate-certificate-programs/).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP

Master's Degree in Civil Engineering with Concentration in Water, Environmental, and Coastal Systems with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Civil Engineering with Concentration in Water, Environmental, and Coastal Systems in addition to earning a Graduate Certificate in Engineering Leadership (https://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/). Students must apply and be admitted to the Gordon Engineering Leadership Program in order to pursue this option. The program requires fulfillment of the 16-semester-hour curriculum required to earn the Graduate Certificate in Engineering Leadership, which includes an industry-based challenge project with multiple mentors. The integrated 36-semester-hour degree and certificate will require fulfillment of the 12-semester-hour core curriculum and 8 semester hours of restricted electives from the WECS concentration coursework. For students who concurrently enroll in the Graduate Certificate in Engineering Leadership, 12 semester hours of the certificate coursework may be applied to the unrestricted elective requirement of this program's coursework option.

The Department of Civil and Environmental Engineering encourages students pursuing a GIEL certificate to complete their MS coursework requirements in their first year and their GIEL certificate requirements in their second year. Students who prefer to complete their GIEL certificate requirements in their first year are asked to speak with their MS degree advisor beforehand.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Core Requirements

Code	Title	Hours
Complete 8 semester hours from the following:		8
CIVE 5281	Coastal Dynamics and Design	
CIVE 7250	Environmental Chemistry	
CIVE 7251	Environmental Biological Processes	
CIVE 7260	Hydrologic Modeling	
CIVE 7281	Coastal and Nearshore Hydrodynamics	

Options

Complete one of the following options:

COURSEWORK OPTION

Code	Title	Hours
Complete 12 semester hours from the restricted electives list below. (p. 2)		12
Complete 12 semester hours from the other electives list below. (p. 2)		12

PROJECT OPTION

Code	Title	Hours
CIVE 7945	Master's Project	4
Complete 12 semester hours from the restricted electives list below. (p. 2)		12
Complete 8 semester hours from the other electives list below. (p. 2)		8

THESIS OPTION

Code	Title	Hours
CIVE 7945	Master's Project	4
CIVE 7990	Thesis	4
Complete 12 semester hours from the restricted electives list below. (p. 2)		12
Complete 4 semester hours from the other electives list below. (p. 2)		4

In addition to completing the thesis course, students must successfully complete the thesis submission process, including securing committee and Graduate School of Engineering signatures and submission of an electronic copy of their MS thesis to ProQuest.

Course Lists

RESTRICTED ELECTIVES LIST

Code	Title	Hours
Any required core course not used to meet the required core course requirement can be taken as a restricted elective.		
CIVE 5250	Organic Pollutants in the Environment	
CIVE 5261	Dynamic Modeling for Environmental Investment and Policymaking	
CIVE 5271	Solid and Hazardous Waste Management	
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 5280	Remote Sensing of the Environment	
CIVE 5300 and CIVE 5301	Environmental Sampling and Analysis and Lab for CIVE 5300	
CIVE 5363	Climate Science, Engineering Adaptation, and Policy	
CIVE 5366	Air Quality Engineering and Science	
CIVE 5536	Hydrologic and Hydraulic Design	
CIVE 7100	Time Series and Geospatial Data Sciences	
CIVE 7110	Critical Infrastructure Resilience	
CIVE 7255	Environmental Physical/Chemical Processes	
CIVE 7278	Air Quality Modeling and Forecasting	
CIVE 7279	Advanced Air Quality	
CIVE 7282	Coastal and Hydraulic Modeling	
ME 6200	Mathematical Methods for Mechanical Engineers 1	

OTHER ELECTIVES LIST

Code	Title	Hours
Any required core course not used to meet the required core course or restricted elective requirements can be taken as another elective. Any restricted elective not used to meet the restricted elective requirement can be taken as another elective.		
CIVE 5100	Equity in Engineering	
CIVE 5150	Climate and Atmospheric Change	
CIVE 5260	Environmental Fluid Mechanics	
CIVE 5670	Global Biogeochemistry	
CIVE 7150	Data-Driven Decision Support for Civil and Environmental Engineering	
CIVE 7151	Urban Informatics and Processing	
CIVE 7388	Special Topics in Civil Engineering (Random Data and Processing)	
EECE 7204	Applied Probability and Stochastic Processes	
ENVR 5260	Geographical Information Systems	
IE 6200	Engineering Probability and Statistics	
IE 7280	Statistical Methods in Engineering	
IE 7290	Reliability Analysis and Risk Assessment	
MATH 7341	Probability 2	

MATH 7343	Applied Statistics
MATH 7344	Regression, ANOVA, and Design

Optional Co-op Experience

Code	Title	Hours
Complete the following (students must complete ENCP 6100 to qualify for co-op experience):		
ENCP 6100	Introduction to Cooperative Education	1
ENCP 6964	Co-op Work Experience	0
or ENCP 6954	Co-op Work Experience - Half-Time	
or ENCP 6955	Co-op Work Experience Abroad - Half-Time	
or ENCP 6965	Co-op Work Experience Abroad	

Program Credit/GPA Requirements

32 total semester hours required (33 with optional co-op)

Minimum 3.000 GPA required