

# Civil Engineering with Concentration in Water, Environmental, and Coastal Systems, MSCIVE

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, complemented by electives in electrical and computer engineering, mechanical and industrial engineering, and earth and environmental sciences.

Degree Requirements	With Report	With Thesis	Course Work 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	
<b>Minimum semester hours required</b>	<b>32 SH</b>	<b>32 SH</b>	<b>32 SH</b>

## 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 (<http://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. 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 32-semester-hour degree and certificate will require 16 hours of advisor-approved environmental and water systems technical courses.

Engineering Leadership (<http://catalog.northeastern.edu/graduate/engineering/leadership/engineering-leadership-graduate-certificate/#text>)

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

## Core Requirements

Code	Title	Hours
Complete 8 semester hours of the following:		8
CIVE 5281	Coastal Dynamics and Design	
CIVE 7250	Environmental Chemistry	
CIVE 7251	Environmental Biological Processes	
CIVE 7260	Hydrologic Modeling	
CIVE 7261	Surface Water Quality Modeling	
CIVE 7272	Air Quality Management	
CIVE 7281	Coastal and Nearshore Hydrodynamics	
CIVE 7392	Special Topics in Environmental Engineering (Hydraulic Modeling)	

## Options

Complete one of the following options:

### COURSE WORK OPTION

Code	Title	Hours
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 12 semester hours from the Other Elective List below.		12

### REPORT OPTION

Code	Title	Hours
CIVE 8674	Master's Report	4
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 8 semester hours from the Other Elective List below.		8

### THESIS OPTION

Code	Title	Hours
CIVE 7990	Thesis	8
Complete 12 semester hours from the Restricted Elective List below.		12
Complete 4 semester hours from the Other Elective List below.		4

## Course Lists

### RESTRICTED ELECTIVE LIST

Any required core course not used to meet the required core course requirement can be taken as a restricted elective.

Code	Title	Hours
CIVE 5260	Environmental Fluid Mechanics	
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	Environmental Engineering Laboratory
CIVE 5536	Hydrologic and Hydraulic Design
CIVE 5699	Special Topics in Civil Engineering (Climate Science and Technology Adaptation Policy)
CIVE 6777	Climate Hazards and Resilient Cities Abroad
CIVE 6778	Climate Adaptation and Policy Abroad
CIVE 7100	Time Series and Geospatial Data Sciences
CIVE 7110	Critical Infrastructure Resilience
CIVE 7252	Water Engineering: Planning, Design, and Management
CIVE 7255	Environmental Physical/Chemical Processes
ME 6200	Mathematical Methods for Mechanical Engineers 1

**OTHER ELECTIVE LIST**

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.

Code	Title	Hours
CIVE 7388	Special Topics in Civil Engineering (Urban Informatics Processing)	
CIVE 7388	Special Topics in Civil Engineering (Random Data and Processing)	
CIVE 7388	Special Topics in Civil Engineering (Informatics in Civil Engineering)	
EECE 7204	Applied Probability and Stochastic Processes	
ENVR 5260	Geographical Information Systems	
EEMB 5516	Oceanography	
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	

**Program Credit/GPA Requirements**

32 total semester hours required

Minimum 3.000 GPA required