Climate Science and Engineering, MS (Boston)

Overview

The Master of Science in Climate Science and Engineering is offered jointly by the College of Engineering and the College of Science. The program provides training in the fundamental scientific processes that underpin the structure and dynamics of the climate, as well as the engineering strategies and technologies required for decarbonization and adaptation to climate change.

Incoming students will typically hold a bachelor's degree in a science, engineering, or related field. The program is designed to prepare students for climate-facing positions in the public or private sectors and can serve as a springboard for students interested in pursuing doctoral-level research. Students must take at least 12 semester hours of College of Science courses and at least 12 semester hours of College of Engineering courses, which includes a report, thesis, or coursework option.

Degree Requirements	With Project	With Thesis	Coursework Only
Required core courses	20 SH	20 SH	20 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. Student 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 Climate Science and Engineering with Graduate Certificate in Engineering Leadership

Students may complete a Master of Science in Climate Science and Engineering 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 20 hours of advisor-approved technical courses. For students who concurrently enroll in the Graduate Certificate in Engineering Leadership (https://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/), 12 semester hours of the certificate coursework may be applied to the restricted elective requirements of this program's coursework option. Of the remaining 20 semester hours required by this program, students must take 12 semester hours of College of Science courses (subject codes EEMB and ENVR) and 8 semester hours from College of Engineering courses (subject codes CIVE, EECE, ENSY, MATL, ME, and SBSY).

The Department of Civil and Environmental Engineering encourages students pursuing the Graduate Certificate in Engineering Leadership (https://catalog.northeastern.edu/graduate/engineering/multidisciplinary/engineering-leadership-graduate-certificate/) to complete their MS coursework requirements in their first year and their certificate requirements in their second year. Students who prefer to complete their certificate requirements in their first year are asked to speak with their MS degree advisor in advance.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated. In order to ensure a balance of training across science and engineering, students must take at least 12 semester hours of College of Science courses (starting with EEMB, ENVR) and at least 12 semester hours of College of Engineering courses (starting with CIVE, EECE, ENSY, MATL, ME, SBSY) from the core requirements and restricted elective course options.

Core Requirements

Code	Title	Hours
Complete 20 semester hours from the core requirements listed below (any core course not used to meet this core course requirement can be taken as a restricted elective):		20
CHME 5692	Carbon Capture, Utilization, and Storage	
CIVE 5150	Climate and Atmospheric Change	
or ENVR 5150	Climate and Atmospheric Change	
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	
CIVE 5281	Coastal Dynamics and Design	
CIVE 5363	Climate Science, Engineering Adaptation, and Policy	
CIVE 5365	Climate Technologies for Decarbonization, Mitigation, and Adaptation	
CIVE 5366	Air Quality Engineering and Science	

CIVE 5670	Global Biogeochemistry
or ENVR 5670	Global Biogeochemistry
CIVE 7110	Critical Infrastructure Resilience
CIVE 7281	Coastal and Nearshore Hydrodynamics
ENVR 5350	Sustainable Energy and Climate Solutions
ENVR 5600	Coastal Processes, Adaptation, and Resilience
ENVR 5800	Climate Adaptation and Nature-Based Solutions

Options

Complete one of the following options:

COURSEWORK OPTION

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

REPORT OPTION

Code	Title	Hours
CIVE 7945	Master's Project	4
or EEMB 8984	Research	
Complete 8 semester hours from the restricted electives course list below. (p. 2)		8

THESIS OPTION

Code	Title	Hours
Complete CIVE 7945 and CIVE 7990 for 8 semester hours or complete EEMB 8984 twice for 8 semester hours:		8
CIVE 7945 and CIVE 7990	Master's Project and Thesis	
EEMB 8984	Research (Completed twice)	
Complete 4 semester hours from the restricted electives course list below. (p. 2)		4

In addition to completing the thesis course, College of Engineering 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.

Restricted Electives

Code	Title	Hours
CIVE 5280	Remote Sensing of the Environment	
CIVE 7100	Time Series and Geospatial Data Sciences	
CIVE 7282	Coastal and Hydraulic Modeling	
CIVE 7392	Special Topics in Environmental Engineering	
EECE 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage	
ENSY 5000	Fundamentals of Energy System Integration	
ENSY 5100	Hydropower	
ENSY 5200	Energy Storage Systems	
ENSY 5500	Smart Grid	
ENSY 5585	Wind Energy Systems	
ENVR 5210	Environmental Planning	
ENVR 5220	Ecosystem-Based Management	
ENVR 5563	Advanced Spatial Analysis	
INTL 5100	Climate and Development	
LPSC 7312	Cities, Sustainability, and Climate Change	
MATL 6270	Principles, Devices, and Materials for Energy Storage and Energy Harvesting	
ME 5685	Solar Thermal Engineering	
PPUA 5238	Climate Change and Global Urbanization	
PPUA 5264	Energy Democracy and Climate Justice: Technology, Policy, and Social Change	
PPUA 5268	International Environmental Policy	
SBSY 5100	Sustainable Design and Technologies in Construction	
SBSY 5200	Sustainable Engineering Systems for Buildings	

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