## Graduate Program Curriculum Outline

### Cooperative Education Option in Civil & Environmental Engineering

#### Master of Science in Environmental Studies

(Environmental Engineering Sciences Concentration)

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### Major Required (Core) Courses (Total # of courses required = 3)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credit hours</th>
<th>Semesters Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE.5730</td>
<td>Solid Waste Engineering</td>
<td>9</td>
<td>F2, I2</td>
</tr>
<tr>
<td>CIVE.5670</td>
<td>Environmental Aquatic Chemistry</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Atmosphere core - choose one:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATMO.5230</td>
<td>Air Pollution Control OR</td>
<td>F2</td>
<td>I2</td>
</tr>
<tr>
<td>ATMO.5710</td>
<td>Air Pollution Phenomenology</td>
<td>S2</td>
<td></td>
</tr>
</tbody>
</table>

SubTotal # Core Credits Required: **9**

### Elective Course Choices (Total # of courses required = up to 7)

Choose any seven *:

- CIVE.5620: Physical and Chemical Hydrogeology (F2)
- CIVE.5610: Physical and Chemical Treatment Processes (I2)
- CIVE.5680: Environmental Fate and Transport (F2)
- CIVE.5780: Biological Wastewater Treatment (I2)
- CIVE.5270: Geotechnical and Environmental Site Characterization (I2)
- CIVE.5290: Engineering with Geosynthetics (I)
- CIVE.5640: Hydraulics and Hydrology (I)
- CIVE.5660: Environmental Applications & Implications of Nanomaterials (I)
- CIVE.5690: Micropollutants in the Environment (I)
- CIVE.5720: Marine and Coastal Processes (I)
- CIVE.5750: Groundwater Modeling (I)
- CIVE.5760: GIS Applications in Civil and Environmental Engineering (I)
- CIVE.5950: Hazardous Waste Site Remediation (F2)
- ENVS.5010: Wetlands Ecology (I)
- ENVS.5020: Freshwater Ecology (I)
- ENVS.5100: Water Resources Management (I)
- ENVI.5200: Methods in Environmental Impact Assessment & Analysis (--)  
- GEOL.5100: Glacial and Pleistocene Geology (--)  
- GEOL.5240: Regional Hydrogeology (--)  
- CHEM.5140: Advanced Analytical Chemistry (F1)  
- ENVS.5810: Understanding the Massachusetts Contingency Plan (S1)  
- ATMO.5710: Air Pollution Phenomenology (S2)

SubTotal # Elective Credits Required*: **21**

### Professional Co-op Option Courses (Total # of courses required = 2)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credit hours</th>
<th>Semesters Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGN.6020</td>
<td>Graduate Professional Development for Engineers</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGN.6030</td>
<td>Graduate Cooperative Experience</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ENGN.6040</td>
<td>Workforce Development</td>
<td>1 optional</td>
<td></td>
</tr>
</tbody>
</table>

SubTotal # Co-op Credits Required*: **2**

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### Curriculum Summary

- Total number of courses required for the degree*: **12**
- Total credit hours required for degree: **32**

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*Elective course choices may also include courses in “core” list not already taken.

**Prerequisite, Concentration or Other Requirements:**

Successful completion of undergraduate prerequisite courses is required prior to registering for graduate courses. Course availability is subject to change.

### Undergraduate prerequisite courses

- CHEM.1210 Chemistry I
- CHEM.1230L Chemistry I Lab
- CHEM.1220 Chemistry I
- CHEM.1240L Chemistry II Lab
- MATH.1310 Calculus I
- MATH.1320 Calculus II
- PHYS.1410 Physics I
- PHYS.1410L Physics I Lab

† F=Fall, S= Spring, I=Intermittent, Su= Summer, CE=online/ContEd, Number indicates approximate years between offerings (ie F1 = every Fall; F2 = every other Fall), Actual course offerings depend on course enrolments & faculty availability
### Plan of Study – Fall Start + 6-month Co-op
Cooperative Education Option in Civil & Environmental Engineering
Master of Science in Environmental Studies
(Environmental Engineering Sciences Concentration)

<table>
<thead>
<tr>
<th>Fall Start with 6-month Co-op</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-12 credits</td>
<td>9 credits + 1-credit Grad. Devel. for Engineer Course</td>
<td>1-credit Co-op Experience</td>
<td>9-12 credits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Required
- CIVE.5730^2
- ENGN.6020
- CIVE.5670^1

#### Atmosphere Core: choose 1 of 2
- ATMO.5230^2
  - choose one of the atmosphere courses if not previously taken
- ATMO.5710^2
  - choose one of the atmosphere courses if not previously taken

#### Electives: choose up to 7
- choose 1 to 3 electives
- ENGN.6030

Depending on whether the two required CIVE courses were previously taken, choose the remaining required CIVE course(s)

Please see Curriculum Outline for Core Course and Electives lists and typical frequency and semester of course offerings

^1 Typically offered every year

^2 Typically offered every two years

^3 Offered intermittently in either Fall or Spring semester

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### Plan of Study – Spring Start + 6-month Co-op
Cooperative Education Option in Civil & Environmental Engineering
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<table>
<thead>
<tr>
<th>Spring Start with 6-month Co-op</th>
<th>Spring</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-12 credits</td>
<td>9 credits + 1-credit Grad. Devel. for Engineer Course</td>
<td>1-credit Co-op Experience</td>
<td>9-12 credits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Required
- CIVE.5670^1
- ENGN.6020
- CIVE.5730^2

#### Atmosphere Core: choose 1 of 2
- ATMO.5230^2
  - choose one of the atmosphere courses if not previously taken
- ATMO.5710^2
  - choose one of the atmosphere courses if not previously taken

#### Electives: choose up to 7
- choose 1 to 3 electives
- ENGN.6030

Depending on whether the two required CIVE courses were previously taken, choose the remaining required CIVE course(s)

Depending on number of electives previously taken, choose electives for a total of 7 for the program

Please see Curriculum Outline for Core Course and Electives lists and typical frequency and semester of course offerings

^1 Typically offered every year

^2 Typically offered every two years

^3 Offered intermittently in either Fall or Spring semester