The data science and environmental science combined major focuses on geological processes that greatly impact the earth, atmosphere, and water in oceans, lakes, and rivers. Understanding these processes requires acquisition and analysis of large amounts of data—an ideal fit with data science, where students study the collection, manipulation, storage, retrieval, and computational analysis of data in its various forms, including numeric, textual, image, and video data from small to large volumes.

**Program Requirements**
Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

**University-Wide Requirements**
All undergraduate students are required to complete the University-Wide Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/).

**NUpath Requirements**
All undergraduate students are required to complete the NUpath Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/nupath/).

### Data Science Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 1200</td>
<td>Leadership Skill Development</td>
<td>1</td>
</tr>
<tr>
<td>CS 1210</td>
<td>Professional Development for Khoury Co-op</td>
<td>1</td>
</tr>
</tbody>
</table>

### Computer Science Fundamental Courses
A grade of C– or higher is required in all computer science fundamental courses except CS 1802:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 1800</td>
<td>Discrete Structures and Seminar for CS 1800</td>
<td>5</td>
</tr>
<tr>
<td>CS 2500</td>
<td>Fundamentals of Computer Science 1 and Lab for CS 2500</td>
<td>5</td>
</tr>
<tr>
<td>CS 2510</td>
<td>Fundamentals of Computer Science 2 and Lab for CS 2510</td>
<td>5</td>
</tr>
</tbody>
</table>

### Computer Science Required Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 3200</td>
<td>Database Design</td>
<td>4</td>
</tr>
<tr>
<td>CS 3500</td>
<td>Object-Oriented Design</td>
<td>4</td>
</tr>
</tbody>
</table>

### Presentation Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>THTR 1170</td>
<td>The Eloquent Presenter</td>
<td>1</td>
</tr>
</tbody>
</table>

### Data Science Foundations

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 3000</td>
<td>Foundations of Data Science</td>
<td>4</td>
</tr>
<tr>
<td>DS 4200</td>
<td>Information Presentation and Visualization</td>
<td>4</td>
</tr>
<tr>
<td>DS 4300</td>
<td>Large-Scale Information Storage and Retrieval</td>
<td>4</td>
</tr>
<tr>
<td>DS 4400</td>
<td>Machine Learning and Data Mining 1</td>
<td>4</td>
</tr>
</tbody>
</table>

### Khoury Elective Courses

With advisor approval, directed study, research, project study, and appropriate graduate-level courses may also be taken as upper-division electives.

Complete 4 credits of CS, CY, DS, or IS classes that are not already required. Choose courses within the following ranges:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CY 2000</td>
<td>higher, except CY 4930</td>
<td></td>
</tr>
<tr>
<td>CS 2500</td>
<td>or higher, except CS 5010</td>
<td></td>
</tr>
<tr>
<td>DS 2000</td>
<td>or higher, except DS 4900</td>
<td></td>
</tr>
<tr>
<td>IS 2000</td>
<td>or higher, except IS 4900</td>
<td></td>
</tr>
</tbody>
</table>

### Environmental Science Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 1101</td>
<td>Environmental Science</td>
<td>4</td>
</tr>
<tr>
<td>ENVR 1200</td>
<td>Dynamic Earth and Lab for ENVR 1200</td>
<td>5</td>
</tr>
<tr>
<td>ENVR 5210</td>
<td>Environmental Planning</td>
<td>4</td>
</tr>
<tr>
<td>ENVR 4900</td>
<td>Earth and Environmental Science Capstone</td>
<td>1</td>
</tr>
<tr>
<td>or ENVR 4997</td>
<td>Senior Thesis</td>
<td></td>
</tr>
<tr>
<td>ENVR 1202</td>
<td>History of Earth and Life and Interpreting Earth History</td>
<td>5</td>
</tr>
<tr>
<td>ENVR 2310</td>
<td>Earth Materials and Lab for ENVR 2310</td>
<td></td>
</tr>
</tbody>
</table>

### Environmental Science Integrative Courses
Complete at least two of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 3300</td>
<td>Geographic Information Systems and Lab for ENVR 3300</td>
<td></td>
</tr>
<tr>
<td>ENVR 3418</td>
<td>Geophysics</td>
<td></td>
</tr>
<tr>
<td>ENVR 4500</td>
<td>Applied Hydrogeology and Lab for ENVR 4500</td>
<td></td>
</tr>
</tbody>
</table>

### Environmental Science Electives
If you complete more than two environmental science integrative courses (above), they will count as environmental science electives.

Complete four of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEMB 3465</td>
<td>Ecological and Conservation Genomics</td>
<td></td>
</tr>
<tr>
<td>EEMB 4000</td>
<td>Applied Conservation Biology</td>
<td></td>
</tr>
<tr>
<td>ENVR 1110</td>
<td>Global Climate Change</td>
<td></td>
</tr>
<tr>
<td>ENVR 2310</td>
<td>Earth Materials</td>
<td></td>
</tr>
<tr>
<td>ENVR 2340</td>
<td>Earth Landforms and Processes and Lab for ENVR 2340</td>
<td></td>
</tr>
<tr>
<td>ENVR 3151</td>
<td>Food Sustainability in the Mediterranean - Abroad</td>
<td></td>
</tr>
<tr>
<td>ENVR 3201</td>
<td>Coastal Sustainability. Ecology and Coupled Human-Natural Systems in Southeast Asia</td>
<td></td>
</tr>
<tr>
<td>ENVR 3202</td>
<td>Coastal Sustainability. The Blue Economy of the Gulf of Maine</td>
<td></td>
</tr>
<tr>
<td>ENVR 4504</td>
<td>Environmental Pollution</td>
<td></td>
</tr>
<tr>
<td>ENVR 4563</td>
<td>Advanced Spatial Analysis</td>
<td></td>
</tr>
<tr>
<td>ENVR 5190</td>
<td>Soil Science</td>
<td></td>
</tr>
</tbody>
</table>
ENVR 5201  Geologic Field Seminar
ENVR 5240  Sedimentary Basin Analysis
and ENVR 5241  and Lab for ENVR 5240
ENVR 5242  Ancient Marine Life
and ENVR 5243  and Lab for ENVR 5242
ENVR 5270  Glacial and Quaternary History
and ENVR 5271  and Lab for ENVR 5270
BINF 6308  Bioinformatics Computational Methods 1
BINF 6309  Bioinformatics Computational Methods 2

Supporting Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1251</td>
<td>Calculus and Differential Equations for Biology 1</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 1341</td>
<td>Calculus 1 for Science and Engineering</td>
<td></td>
</tr>
<tr>
<td>ENVR 2500</td>
<td>Biostatistics and Lab for ENVR 2500</td>
<td>5</td>
</tr>
</tbody>
</table>

Chemistry

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1211</td>
<td>General Chemistry 1</td>
<td>5</td>
</tr>
<tr>
<td>and CHEM 1212</td>
<td>and Lab for CHEM 1211</td>
<td></td>
</tr>
<tr>
<td>and CHEM 1213</td>
<td>and Recitation for CHEM 1211</td>
<td></td>
</tr>
<tr>
<td>CHEM 1214</td>
<td>General Chemistry 2</td>
<td>5</td>
</tr>
<tr>
<td>and CHEM 1215</td>
<td>and Lab for CHEM 1214</td>
<td></td>
</tr>
<tr>
<td>and CHEM 1216</td>
<td>and Recitation for CHEM 1214</td>
<td></td>
</tr>
</tbody>
</table>

Computer Science English Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGW 1111</td>
<td>First-Year Writing</td>
<td>4</td>
</tr>
<tr>
<td>or ENGW 1102</td>
<td>First-Year Writing for Multilingual Writers</td>
<td></td>
</tr>
</tbody>
</table>

Advanced Writing in the Disciplines

Complete one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGW 3302</td>
<td>Advanced Writing in the Technical Professions</td>
<td>4</td>
</tr>
<tr>
<td>ENGW 3307</td>
<td>Advanced Writing in the Sciences</td>
<td></td>
</tr>
<tr>
<td>ENGW 3315</td>
<td>Interdisciplinary Advanced Writing in the Disciplines</td>
<td></td>
</tr>
</tbody>
</table>

Integrative Requirement

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS 4900</td>
<td>Data Science Senior Project</td>
<td>4</td>
</tr>
</tbody>
</table>

Required General Electives

Complete 20 credits of general electives.

Khoury College GPA Requirement
Minimum 2.000 GPA required in all CS, CY, DS, and IS courses

NUpath Requirements Satisfied
- Writing in the First Year
- Advanced Writing in the Disciplines
- Writing-Intensive in the Major
- Demonstrating Thought and Action in a Capstone

Integrating Knowledge and Skills Through Experience is satisfied through co-op.

Program Requirement
138 total semester hours required

Plan of Study
Sample Patterns:
Four Years, Two Co-ops in Summer 2/Fall

Year 1

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 1200</td>
<td>1</td>
<td>CS 2510 and CS 2511</td>
<td>5</td>
<td>CS 3500</td>
<td>4</td>
<td>Vacation</td>
<td></td>
</tr>
<tr>
<td>CS 1800 and CS 1802</td>
<td>5</td>
<td>ENVR 1101</td>
<td>4</td>
<td>CS 3200</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 2500 and CS 2501</td>
<td>5</td>
<td>ENVR 1202 and ENVR 1203</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR 1200 (ENVR 1201 (lab if offered))</td>
<td>4</td>
<td>ENVR 2500 and ENVR 2501</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGW 1111</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Year 2

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 5210</td>
<td>4</td>
<td>CHEM 1214 and CHEM 1215</td>
<td>5</td>
<td>MATH 1341 or 1251</td>
<td>4</td>
<td>Co-op</td>
<td></td>
</tr>
<tr>
<td>CHEM 1211 and CHEM 1212 and CHEM 1213</td>
<td>5</td>
<td>MATH 1251 or 1341</td>
<td>4</td>
<td>Elective</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS 3000</td>
<td>4</td>
<td>DS 4200</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR elective</td>
<td>4</td>
<td>DS 4300</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR elective</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR elective (take lab if offered)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS 1210</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Year 3

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-op</td>
<td></td>
<td>ENVR elective</td>
<td>4</td>
<td>ENGW 3302</td>
<td>4</td>
<td>Co-op</td>
<td></td>
</tr>
<tr>
<td>Khoury elective</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR elective</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVR integrative (take lab if offered)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Data Science and Environmental Science, BS

### Year 4

**Fall**
- THTR 1170 1
- **Hours**: 0
- **Spring**
- ENVR 4900 4
- **Hours**: 1
- **Summer 1**
- Elective 4
- **Hours**: 4
- **Summer 2**
- **Hours**: 8
- **Co-op**: 0

**Hours Total**: 139

### Five Years, Three Co-ops in Summer 2/Fall

#### Year 1

**Fall**
- CS 1200 4
- **Hours**: 1
- CS 2510 5
- **Hours**: 5
- CS 1800 4
- **Hours**: 5
- CS 2500 5
- **Hours**: 5
- ENVR 1200 4
- **Hours**: 4
- ENGW 1111 4
- **Hours**: 4
- **Vacation**: 19
- **Co-op**: 0
- **Summer 1**
- **Vacation**: 0
- **Summer 2**
- **Hours**: 0
- **Total Hours**: 139

#### Year 2

**Fall**
- CS 3500 4
- **Hours**: 4
- CHEM 1214 5
- **Hours**: 5
- CHEM 1215 5
- **Hours**: 5
- CHEM 1216 5
- **Hours**: 5
- ENVR 5210 4
- **Hours**: 4
- ENVR 2500 5
- **Hours**: 5
- **Vacation**: 18
- **Co-op**: 0
- **Summer 1**
- **Hours**: 0
- **Summer 2**
- **Hours**: 0
- **Total Hours**: 139

#### Year 3

**Fall**
- Co-op 0
- **Hours**: 0
- MATH 1251 4
- **Hours**: 4
- **Vacation**: 4
- **Co-op**: 0
- **Summer 1**
- **Vacation**: 4
- **Summer 2**
- **Hours**: 0
- **Total Hours**: 139

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[Data Science and Environmental Science, BS](#)