The computer science and the environmental and sustainability sciences combined major focuses on the major environmental challenges facing our planet and provides broad training to understand how these challenges can be met through advances in computer science and artificial intelligence. Understanding these processes requires both the acquisition and computational analysis of large amounts of data—underscoring the synergistic relationship between computer science and environmental and sustainability sciences.

**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/).

**Computer Science Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CS 1200</td>
<td>First Year Seminar</td>
<td>1</td>
</tr>
<tr>
<td>CS 1210</td>
<td>Professional Development for Khoury Co-op</td>
<td>1</td>
</tr>
<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>
<tr>
<td>CS 3000</td>
<td>Algorithms and Data and Recitation for CS 3000</td>
<td>4</td>
</tr>
<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>
<tr>
<td>CS 3800</td>
<td>Theory of Computation</td>
<td>4</td>
</tr>
<tr>
<td>CS 4500</td>
<td>Software Development</td>
<td>4</td>
</tr>
</tbody>
</table>

**Khoury Elective Courses**

With advisor approval, a directed study, research, project study, or appropriate graduate-level course may also be taken as a computer science elective.

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

- CS 2500 or higher, except CS 5010
- CY 2000 or higher, except CY 4930

**Environmental and Sustainability Sciences Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>ENVR 1400 and ENVR 1401</td>
<td>Foundations in Environmental and Sustainability Sciences and Lab for ENVR 1400</td>
<td>5</td>
</tr>
<tr>
<td>ENVR 2200 or ENVR 1200</td>
<td>Earth’s Changing Cycles and Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>EEMB 2302 and EEMB 2303</td>
<td>Ecology and Lab for EEMB 2302</td>
<td>5</td>
</tr>
<tr>
<td>ENVR 2515</td>
<td>Sustainable Development</td>
<td>4</td>
</tr>
</tbody>
</table>

Choose one from each category:

**Skills**

- ENVR 3300 and ENVR 3301 | Geographic Information Systems and Lab for ENVR 3300 | 4-5 |
- or EEMB 3555 | Networks and Natural Systems | 4-5 |

**Earth Oceans and Environmental Change**

- ENVR 2310 and ENVR 2311 | Earth Materials and Lab for ENVR 2310 | 4-5 |
- ENVR 3600 | Oceanography | 4-5 |
- ENVR 3125 | Global Oceanic Change | 4-5 |
- ENVR 4500 and ENVR 4501 | Applied Hydrogeology and Lab for ENVR 4500 | 4-5 |

**Conservation, Restoration, and Management**

- EEMB 2400 | Introduction to Evolution | 4-5 |
- EEMB 3460 | Conservation Biology | 4-5 |
- EEMB 4001 | Landscape and Restoration Ecology | 4-5 |
- EEMB 3465 | Ecological and Conservation Genomics | 4-5 |

**Sustainable Planning and Development**

- ENVR 3200 | Water Resources | 4-5 |
- ENVR 3150 | Food Security and Sustainability | 4-5 |
- ENVR 5210 | Environmental Planning | 4-5 |
- ENVR 5350 | Sustainable Energy and Climate Solutions | 4-5 |

**Environment and Society**

- POLS 2395 | Environmental Politics and Policy | 4-5 |
- PPUA 5260 | Ecological Economics | 4-5 |
- PPUA 5268 | International Environmental Policy | 4-5 |
- SOCL 2485 | Environment, Technology, and Society | 4-5 |

**Supporting Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</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>4</td>
</tr>
<tr>
<td>MATH 1252</td>
<td>Calculus and Differential Equations for Biology 2</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 1342</td>
<td>Calculus 2 for Science and Engineering</td>
<td>4</td>
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</tbody>
</table>
MATH 3081  Probability and Statistics  4

Chemistry
CHEM 1211  General Chemistry 1  5
and CHEM 1212  and Lab for CHEM 1211  4
and CHEM 1213  and Recitation for CHEM 1211  4
CHEM 1214  General Chemistry 2  5
and CHEM 1215  and Lab for CHEM 1214  5
and CHEM 1216  and Recitation for CHEM 1214  5

Computing and Social Issues
Complete one of the following:  4

CY 5240  Cyberlaw: Privacy, Ethics, and Digital Rights  4
ENGL 2150  Literature and Digital Diversity  4
HIST 2220  History of Technology  4
INSH 2102  Bostonography: The City through Data, Texts, Maps, and Networks  4
IS 1300  Knowledge in a Digital World  4
or PHIL 1300  Knowledge in a Digital World  4
PHIL 1145  Technology and Human Values  4
SOCL 1280  The Twenty-First-Century Workplace  4
SOCL 4528  Computers and Society  4

Computer Science English Requirement
Code  Title  Hours
College Writing
ENGW 1111  First-Year Writing  4
or ENGW 1102  First-Year Writing for Multilingual Writers  4

Advanced Writing in the Disciplines
Complete one of the following:  4
ENGW 3302  Advanced Writing in the Technical Professions  4
ENGW 3307  Advanced Writing in the Sciences  4
ENGW 3315  Interdisciplinary Advanced Writing in the Disciplines  4

Integrative Requirement
Code  Title  Hours
Complete one of the following:  4
ENVR 4050  Solving Emerging Environmental Challenges through Capstone  4
ENVR 4971  Junior/Senior Honors Project 2  4
ENVR 4997  Senior Thesis  4
CS 4991  Research  4

Required General Electives
Code  Title  Hours
Complete 20 credits of general electives.  20

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

NUpath Requirements Satisfied
* Engaging with the Natural and Designed World
* Conducting Formal and Quantitative Reasoning

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

Program Requirement
136 total semester hours required

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

Year 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>CS 1200</td>
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<tr>
<td>CS 2510 and CS 2511</td>
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<tr>
<td>CS 1800 and CS 1802</td>
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<td>CS 2500 and CS 2501</td>
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Year 2

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<tr>
<td>EEMB 2302 and EEMB 2303</td>
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<tr>
<td>CS 3000</td>
<td>4</td>
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<tr>
<td>ENVR 2515</td>
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Year 3

<table>
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<td>CS 1210</td>
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Year 4

<table>
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<tbody>
<tr>
<td>CS 3800</td>
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<td>ENVR conservation course</td>
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• Analyzing and Using Data
• Writing in the First Year
• Advanced Writing in the Disciplines
• Writing-Intensive in the Major
• Demonstrating Thought and Action in a Capstone
<table>
<thead>
<tr>
<th>Year 4</th>
<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>
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<tbody>
<tr>
<td>Co-op</td>
<td></td>
<td></td>
<td>CS 4500</td>
<td>4</td>
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<td>ENVR Sustainable course</td>
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<tr>
<td>Elective</td>
<td>4</td>
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<table>
<thead>
<tr>
<th>Year 4</th>
<th>Fall</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Co-op</td>
<td></td>
<td></td>
<td>MATH 1252 or 1342</td>
<td>4 Elective</td>
<td>4 Co-op</td>
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<tr>
<td>Integrative course</td>
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<tr>
<td>Computing and social issues</td>
<td>4</td>
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<table>
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<tr>
<th>Year 5</th>
<th>Fall</th>
<th>Hours</th>
<th>Summer 1</th>
<th>Hours</th>
<th>Summer 2</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Co-op</td>
<td></td>
<td></td>
<td>ENVR Earth oceans course</td>
<td>4 Elective</td>
<td>4</td>
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