<table>
<thead>
<tr>
<th>Requirement*</th>
<th>Notes</th>
<th>Course #</th>
<th>Credits</th>
<th>Term</th>
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<tbody>
<tr>
<td><strong>Engineering</strong></td>
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<tr>
<td><strong>Civil Engineering Core</strong></td>
<td>15CR from the Civil and Environmental Engineering Department</td>
<td>Required:</td>
<td>CEE 520</td>
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<td></td>
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<td>CEE 521</td>
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<td>CEE 522</td>
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<td></td>
<td>Minimum of 2 additional CEE courses in Environmental and Water Resource Engineering</td>
<td>See List A for sample of approved courses (next page)</td>
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<tr>
<td><strong>AS CORE</strong></td>
<td>9-12CR in Aquatic Sciences (courses on next page)</td>
<td>One course each from:</td>
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<td></td>
<td></td>
<td>1) Organism Biology</td>
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<td>2) Ecosystem Ecology</td>
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<td>3) Ecosystem Modeling</td>
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<tr>
<td><strong>Natural Resources and Environment</strong></td>
<td>NRE 509</td>
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<td>NRE 510</td>
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<tr>
<td><strong>NRE Core</strong></td>
<td>IAMS Requirement</td>
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<td></td>
<td>Two courses: 3CR minimum</td>
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<td>Please reverse for approved courses.</td>
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<tr>
<td><strong>Analytics</strong></td>
<td>2 Analytics courses</td>
<td>NRE 538 or approved alternate and one additional Analytics course</td>
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<tr>
<td><strong>Opus</strong>*</td>
<td>Students are not expected to complete an Opus, but could petition to do a thesis/practicum or project*</td>
<td>At most 6CR of NRE 700/701</td>
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<tr>
<td><strong>Cognates [Rackham requirement]</strong></td>
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<td>Please see next page for cognate requirement information</td>
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<tr>
<td><strong>TOTALS</strong></td>
<td>MINIMUM CREDIT HOURS BY SCHOOL</td>
<td>“NRE” – Minimum 25CR</td>
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<td>“CEE” – Minimum 15CR</td>
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<td>TOTAL CREDIT HOURS</td>
<td>Minimum 54 Credit Hours</td>
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*Any waiver or substitution of degree requirement must be approved by the appropriate faculty and submitted to OAP*
A) Civil Engineering

Sample of Environmental and Water Resources courses (more available, see advisor):

- CEE 524 (3) Environmental Turbulence (W)
- CEE 527 (3) Coastal Hydraulics (F)
- CEE 580 (3) Physicochemical Processes in Environmental Engineering (W)
- CEE 581 (3) Aquatic Chemistry (F&W)
- CEE 582 (3) Environmental Microbiology (F)
- CEE 586/NRE 557 (3) Industrial Ecology (W)
- CEE 590 (3) Stream, Lake, and Estuary Analysis
- CEE 592 (3) Biological Processes in Environmental Engineering (W)
- CEE 624 (3) Restoration Fundamentals and Practice in Aquatic Systems (F)

Natural Resources and Environment Aquatic Sciences

1) Organismal Biology
   - Choose one:
     - NRE 409 – Ecology of Fishes OR
     - EEB 486 – Biology & Ecology of Fishes (UMBS)
     - NRE 422 – Biology of Fishes
     - EEB 457 – Algae in Freshwater Systems
     - NRE 516 – Aquatic Entomology

2) Ecosystem Ecology
   - Choose one:
     - NRE 476 – Ecosystem Ecology
     - EEB 483 – Limnology
     - NRE 520 – Fluvial Ecosystems

3) Ecosystem Modeling
   - Choose one:
     - NRE 534 – GIS and Landscape Modeling
     - EEB 401 – Interrogating Data with Models

Cognates

SNRE – Minimum 4 credits outside SNRE. Can be fulfilled with CEE coursework.

CEE – 6 credits of non-CEE coursework. Can be fulfilled with one advanced Mathematics course (proper choice of SNRE Analytical courses can also satisfy this requirement) and one SNRE course.

Integrated Analytic Methods and Skills Requirement

Students are required, at some point during their time enrolled in the program, to take 2 courses composing at least 3 credits from a faculty-approved list of courses that focus on integrative analytic methods and skills. The faculty-approved existing courses that satisfy this requirement are listed below:

Fall

- 501 – Land Use and Global Change
- 501 – Urban Stormwater
- 501 – Ecosystem Services
- 514 – Environmental Impact Assessment
- 533 – Negotiation Skills
- 536 – Mediation Skills
- 597 – Environmental Systems Analysis
- 662 – Localization Seminar
- 677 – Climate Adaptation Seminar (2nd 7 week)

Winter

- 501 – Science and Management of the Great Lakes
- 501 – Biofuels and Sustainability
- 501 – Advanced LCA Methods and Software Tools (W14 – 2nd 7 weeks)
- 501 - Applied Ecosystem Modeling (W14 – 2nd 7 weeks)
- 550 – Systems Thinking for Sustainable Development
- 557 – Industrial Ecology
- 570 – Environmental Economics
- 581 – Advanced Environmental Education
- 589 – Ecological Restoration
- 641 – Interdisciplinary Research Methods
- 687 – Landscape Planning
- 787 – Metro Studio (MLA only)

Last Revised 07/14/2014