<table>
<thead>
<tr>
<th>Requirement*</th>
<th>Notes</th>
<th>Course #</th>
<th>Credits</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>15CR from the Civil and Environmental Engineering Department</td>
<td>Required: CEE 520, CEE 521, CEE 522</td>
<td>CEE 520</td>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td>CEE 521</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-12CR in Aquatic Sciences (courses on next page)</td>
<td>One course each from: 1) Organismal Biology, 2) Ecosystem Ecology, 3) Ecosystem Modeling</td>
<td>CEE 522</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NRE 509, NRE 510</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IAMS Requirement Two courses; 3CR minimum Please reverse for approved courses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Analytics courses</td>
<td>NRE 538 or approved alternate and one additional Analytics course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<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>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognates (Rackham requirement)</td>
<td>Please see next page for cognate requirement information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MINIMUM CREDIT HOURS BY SCHOOL</strong></td>
<td>“NRE” – Minimum 25CR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>“CEE” – Minimum 15CR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL CREDIT HOURS</strong></td>
<td>Minimum 54 Credit Hours</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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 – Social Vulnerability & Adaptation to Environ Change
578 – Urban Stormwater
552 – Ecosystem Services
514 – Environmental Impact Assessment
533 – Negotiation Skills
536 – Mediation Skills
548 – Land Use and Global Change
570 – Environmental Economics
597 – Environmental Systems Analysis
564 – Localization Seminar
677 – Climate Adaptation Seminar (2nd 7 week)
687 – Landscape Planning

Winter
501 – Network Analysis for Nat Res & Environ Planning (Winter A)
501 – Science and Management of the Great Lakes
501 – Decision Making for Sustainability
545 – Applied Ecosystem Modeling (W14 – 2nd 7 weeks)
550 – Systems Thinking for Sustainable Development
557 – Industrial Ecology
581 – Advanced Environmental Education
589 – Ecological Restoration
610 – Advanced LCA Methods and Software Tools (W14 – 2nd 7 weeks)
641 – Interdisciplinary Research Methods
787 – Metro Studio (MLA only)

Last Revised 05/19/2016