## Summary of Requirements for a Master of Science (MS) Degree Effective Fall 2019

<table>
<thead>
<tr>
<th>Sustainable Systems</th>
<th>Requirements</th>
<th>Notes</th>
<th>Course</th>
<th>Credits</th>
<th>Term</th>
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</thead>
<tbody>
<tr>
<td>SS Core</td>
<td>6CR in Systems Analysis for Sustainability</td>
<td>See attached list (A1) of acceptable courses in this specialization</td>
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<td></td>
<td>Sustainable Design &amp; Technology Minimum 3CR</td>
<td>See attached list (A2) of acceptable courses in this specialization</td>
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<td></td>
<td>Sustainable Enterprise Minimum 3CR</td>
<td>See attached list (A3) of acceptable courses in this specialization</td>
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<td></td>
<td>Additional 3CR minimum from list A1, 2, or 3</td>
<td>See attached list (A1-3) of acceptable courses in these specializations</td>
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<tr>
<td>SEAS Core</td>
<td>EAS 509 (Natural Systems Core) EAS 510(Social Systems Core)</td>
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<td></td>
<td>IAMS Requirement Two courses; 3CR minimum</td>
<td>Please see page 3 for approved courses.</td>
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<td>Analytics</td>
<td>One statistics course. [Field of Study-specific requirement]</td>
<td>See online list of acceptable statistics courses</td>
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<td>Electives</td>
<td>Electives</td>
<td>Graduate level course at 400-level or above. See attached list of recommended courses.</td>
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<td>Opus or Non-Opus</td>
<td>Option 1: Master’s Project, Thesis or Practicum</td>
<td>At most 6 credit hours of EAS 701 (Master’s Project) or EAS 702 (Master’s Practicum) or At most 12 credits of EAS 700 (Master’s Thesis)</td>
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<td>Option 2: Additional coursework</td>
<td>3CR from list A1,A2, or A3 or B1 and additional 3CR from approved sustainability course (eg B2). Needs to have a theme in the area you wish to gain additional knowledge. Needs advisor approval.</td>
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<td>TOTALS</td>
<td>TOTAL “EAS” CREDIT HOURS</td>
<td>Minimum 25 of 42 credit hours</td>
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<td></td>
<td>TOTAL CREDIT HOURS</td>
<td>Minimum of 42 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. Sustainable Systems Core (1-3)

1) Systems Analysis for Sustainability (at least 6CR*)

- EAS 573 (3cr) Environmental Footprinting and Environmental Input-Output Analysis (W)
- EAS 610 (1.5cr) Advanced LCA Methods & Software Tools (W)
- EAS 597 (3cr) Environmental Systems Analysis (F)
- EAS 557/CEE 586 (3cr) Industrial Ecology (W)
- EAS 550/STRAT 566 (3cr) Systems Thinking for Sustainable Development (W)

*At least two courses need to be from the courses listed above

- EAS 570 (3cr) Environ Economics: Quantitative Methods & Tools (F)
- EAS 501 (1.5cr) Five courses on selected topics in Env. Economics (FA B & WN A&B)
- EAS 531 (4cr) Principles of GIS (F&W)

2) Sustainable Design & Technology (3CR)

- EAS 537 (3CR) Urban Sustainability (F)
- EAS 501.087 (3CR) Technology and Community Sustainable Development (F)
- EAS 615 (3CR) Renewable Electricity and the Grid (W)
- EAS 574/PUBPOL 519 (3cr) Sustainable Energy Systems (F)
- EAS 605/BA 605 (3cr) Green Development (W)
- EAS 687 (4cr) Landscape Planning (F)
- ARCH 575 (3cr) Building Ecology (F)
- CEE 480 (3cr) Design of Environ Engineering Systems (F)
- CEE 582 (3cr) Environmental Microbiology (F)
- MECHENG 589 (3cr) Sustainable Design of Technology Systems (W)

3) Sustainable Enterprise (3CR)

- EAS 530 (3cr) Decision-Making for Sustainability (F)
- EAS 525 (3cr) Energy Justice (F)
- EAS 501.159 (1.5cr) Triple-Bottom Line Seminar (W)
- EAS 535/BL 536 (2.25cr) Ethics Corporate Management (F or W)
- EAS 512/STRATEGY 564 Strategies for Sustainable Development I (F)
- EAS 513/STRATEGY 565 Strategies for Sustainable Development II (F)
- EAS 527/BE 527 (3cr) Energy Markets and Energy Politics (F)
- EAS 533 (3cr) Negotiation Skills (F)
- EAS 595/TO 560 Sustainable Operations and Supply Chain Management (W)
- BE 555 (1.5) Non-Market Strategy (F)
- EAS 560/URP 544 (3cr) Behavior and Environment (F)
- EAS 576/CEE 588/CH 590 (3cr) Sustainability Finance: Investment Model for Green Growth (F)
- ENGR 521 (3cr) CleanTech Entrepreneurship (W)
- FIN 637 (2.25cr) Finance and Sustainable Enterprises (F)
- FIN 583 (1.5cr) Energy Project Finance (W)

B. Sustainable Systems Electives

B1) Additional SS courses (can count towards Non-Opus option)

- EAS 572(2cr) Environmental Impact Assessment (F)
- EAS 523(3cr) Environmental Risk Assessment (W)
- EAS 552 (3cr) Ecosystem Services (F)
- EHS 672 (3cr) Life Cycle Assessment: Human Health & Environ Impacts (F)
- EAS 686/HMP 686/PubPol 563 (3cr) Environmental Policy (W)
- BA 612 (2.25cr) Strategies for the Base of the Pyramid (F)
- ESENG 501 (3cr) Seminars in Energy Science, Technology, and Policy (F)
- Econ 437 (3cr) Energy Economics & Policy (W)
- URP 553 Sustainable Urbanism and Architecture (F)
B2) Sustainable Systems Themes:

- Energy Systems
- Mobility Systems
- Water Systems
- Food Systems
- Built Environment
- Climate Change

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

447 – Forest Ecology Management
501 – Ecological Restoration Applications
523 – Ecological Risk Assessment
530 – Decision-Making for Sustainability
531 – Principles of GIS
533 – Negotiation Skills
536 – Mediation Skills
552 – Ecosystem Services
553 – Diverse Farming Systems
564 – Localization Seminar
567 – Social Vulnerability & Adaptation to Environ Change
572 – Environmental Impact Assessment
570 – Environmental Economics
576 – Sustainability Finance
578 – Urban Stormwater
597 – Environmental Systems Analysis
677 – Climate Adaptation Seminar
687 – Landscape Planning

Winter

501 – Science and Management of the Great Lakes
541 – Remote Sensing
545 – Applied Ecosystem Modeling (Winter B)
549 – Analysis and Modeling of Ecological Data
550 – Systems Thinking for Sustainable Development
557 – Industrial Ecology
569 – Stakeholder Network Analysis
581 – Advanced Education for Environment and Sustainability
589 – Ecological Restoration
610 – Advanced LCA Methods and Software Tools
641 – Interdisciplinary Research Methods
787 – Metro Studio (MLA only)