MASTER OF SCIENCE IN ENVIRONMENTAL ANALYSIS (MSEA) DEGREE

Program Learning Outcomes for the MSEA Degree

Upon completing the MSEA Degree, students will be able to:

1. Apply technical and analytical skills and scientific evaluation methods to help solve problems affecting the environment.
2. Demonstrate written, oral, and visual communication strategies required to work effectively across science, business, and government.
3. Possess business and management skills and professional ethics to be effective in a business environment.

Requirements for the MSEA Degree

The MSEA degree is a non-thesis master’s degree. For general university requirements, please see Non-Thesis Master’s Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/).

Students pursuing the MSEA degree must complete:

- A minimum of 14 courses (minimum of 39 credit hours) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (graduate semester credit hours, coursework at the 500-level or above).
- A minimum of 24 graduate semester credit hours must be taken at Rice University.
- A minimum of 24 graduate semester credit hours must be taken in standard or traditional courses (with a course type of lecture, seminar, laboratory, lecture/laboratory, etc.).
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- A maximum of 2 courses (6 graduate semester credit hours) from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies (p. 3) tab.
- A 3-6 month full-time internship. Instead of a thesis, at the conclusion of their internship, students must present their internship project in both oral and written form as part of the Professional Master’s Project (NSCI 512). Part-time students who already work in their area of study may request approval to fulfill the internship requirement by working on a specific, pre-approved project with their current employer.
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 2.67 or higher in all Rice coursework that satisfies requirements for the non-thesis master's degree.

Note: Some of the listed courses are not offered every year, and some may also have prerequisites or require instructor permission.

The courses listed below satisfy the requirements for this degree program. In certain instances, courses not on this official list may be substituted upon approval of the program's academic advisor, or where applicable, the department or program's Director of Graduate Studies. Course substitutions must be formally applied and entered into Degree Works by the department or program's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). Additionally, these must be approved by the Office of Graduate and Postdoctoral Studies. Students and their academic advisors should identify and clearly document the courses to be taken.

### Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the MSEA Degree</td>
<td>39</td>
</tr>
</tbody>
</table>

### Degree Requirements

#### Core Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 571</td>
<td>ENVIRONMENTAL MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>CEVE 501</td>
<td>CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>or CEVE 510</td>
<td>PRINCIPLES OF ENVIRONMENTAL ENGINEERING</td>
<td>3</td>
</tr>
</tbody>
</table>

Select 1 course from the following:

- BIOS 538 | ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA | 3 |
- BIOS 558 | FUNDAMENTALS OF QUANTITATIVE ENVIRONMENTAL HEALTH RISK ASSESSMENT | 3 |
- CEVE 543 | DATA-DRIVEN MODELS FOR CLIMATE HAZARD | 3 |

#### Cohort Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSCI 501</td>
<td>PROFESSIONAL MASTER'S SEMINAR (2 semesters required, 1st semester)</td>
<td>1</td>
</tr>
<tr>
<td>NSCI 501</td>
<td>PROFESSIONAL MASTER'S SEMINAR (2 semesters required, 2nd semester)</td>
<td>1</td>
</tr>
<tr>
<td>NSCI 511</td>
<td>SCIENCE POLICY, AND ETHICS</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 610 / ENGI 610</td>
<td>MANAGEMENT FOR SCIENCE AND ENGINEERING</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Elective Requirements

Select a minimum of 7 courses (minimum of 21 credit hours) as electives (see course list below): 1,2

- Three to Six Month Full-Time Internship

A three to six month full-time internship is required 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSCI 512</td>
<td>PROFESSIONAL MASTER'S PROJECT</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Credit Hours 39

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1 The 21 credit hours of electives must include at least 3 credit hours from Management and Policy, 9 credit hours from one focus area, 1 course each from the following subject codes: Biosciences (BIOS) and Civil and Environmental Engineering (CEVE), and 1 course from the Quantitative Decision-Making focus area.
Quantitative Decision-Making focus area.

and Civil and Environmental Engineering (CEVE), and 1 course from the area, 1 course each from the following subject codes: Biosciences (BIOS) for the Management and Policy focus area, 9 credit hours from one focus area, 1 course each from the following courses. At least 3 credit hours must be completed from the Quantitative Decision-Making focus area.

Students must complete a minimum of 7 courses (21 credit hours) from the following courses. At least 3 credit hours must be completed from the Management and Policy focus area, 9 credit hours from one focus area, 1 course each from the following subject codes: Biosciences (BIOS) and Civil and Environmental Engineering (CEVE), and 1 course from the Quantitative Decision-Making focus area.

### Course Lists to Satisfy Requirements

#### Elective Requirements

Students must complete a minimum of 7 courses (21 credit hours) from the following courses. At least 3 credit hours must be completed from the Management and Policy focus area, 9 credit hours from one focus area, 1 course each from the following subject codes: Biosciences (BIOS) and Civil and Environmental Engineering (CEVE), and 1 course from the Quantitative Decision-Making focus area.

### Note: Some of the listed courses are not offered every year, and other coursework may be offered that satisfies the stated requirements upon approval. Depending on the student's background or interest, course substitutions for any required or elective course may be approved by the program's academic advisor. Students should consult with their academic advisors before enrolling.

#### Three to Six Month Full-Time Internship: Practical experience is offered via a three to six month full-time internship. The internship will be under the guidance of a host company, government agency, or non-profit organization. At the conclusion of the internship, students must present a summary of their internship project in both oral and written form as part of the cohort course Professional Master's Project (NSCI 512). Part-time students who already work in their area of study may fulfill the internship requirements by working on an approved project with their current employer.

### Course Lists to Satisfy Requirements

#### Elective Requirements

Students must complete a minimum of 7 courses (21 credit hours) from the following courses. At least 3 credit hours must be completed from the Management and Policy focus area, 9 credit hours from one focus area, 1 course each from the following subject codes: Biosciences (BIOS) and Civil and Environmental Engineering (CEVE), and 1 course from the Quantitative Decision-Making focus area.

#### Code | Title | Credit Hours
--- | --- | ---
BIOS 523 | CONSERVATION BIOLOGY | 3
BIOS 559 | SUSTAINABILITY IMPACT ASSESSMENTS | 3
BIOS 563 | TOPICS IN ECOLOGY (FALL) | 1
BIOS 568 | TOPICS IN ECOLOGY (SPRING) | 1
BIOS 569 | CORE COURSE IN ECOLOGY AND EVOLUTIONARY BIOLOGY | 1
BIOS 573 | CORAL REEF ECOSYSTEMS | 3
BIOS 574 | GLOBAL CHANGE BIOLOGY | 3
BIOS 580 | SUSTAINABLE DEVELOPMENT AND REPORTING | 3
CEVE 501 | CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE | 3
CEVE 502 | SUSTAINABLE DESIGN | 3
CEVE 507 | ENERGY AND THE ENVIRONMENT | 3
CEVE 508 | INTRODUCTION TO AIR POLLUTION CONTROL | 3
CEVE 509 | HYDROLOGY AND WATER RESOURCES ENGINEERING | 3
CEVE 511 | ATMOSPHERIC CHEMISTRY AND CLIMATE | 3
CEVE 518 | ENVIRONMENTAL HYDROGEOLOGY | 3
CEVE 520 | ENVIRONMENTAL REMEDIATION RESTORATION | 3
CEVE 523 | APPLIED SUSTAINABLE PLANNING AND DESIGN | 3
CEVE 526 | SMART MATERIALS FOR THE ENVIRONMENT | 3
CEVE 534 | FATE AND TRANSPORT OF CONTAMINANTS IN THE ENVIRONMENT | 3
CEVE 535 | PHYSICAL CHEMICAL PROCESSES FOR WATER QUALITY CONTROL | 3
CEVE 536 | ENVIRONMENTAL BIOTECHNOLOGY AND BIOREMEDIATION | 3
CEVE 544 | ENVIRONMENTAL MICROBIOLOGY AND MICROBIAL ECOLOGY | 3
CEVE 550 | ENVIRONMENTAL ORGANIC CHEMISTRY | 3
DSCI 535 / COMP 549 | APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS | 4
EEPS 592 | SPECIAL TOPICS IN EARTH, ENVIRONMENTAL & PLANETARY SCIENCES | 2
EEPS 632 | QUANTITATIVE HYDROGEOLOGY | 3
EEPS 635 | REMOTE SENSING | 3
EEPS 645 | EARTH AND PLANETARY INTERIORS | 3
EEPS 699 | GRAPHIC AND VISUAL DESIGN FOR SCIENTISTS | 3
MGMT 658 | APPLIED RISK MANAGEMENT | 1.5
MGMT 758 | ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) ISSUES IN STRATEGY | 1.5

#### Code | Title | Credit Hours
--- | --- | ---
CEVE 506 | INTRODUCTION TO ENVIRONMENTAL LAW | 3
CEVE 528 / ENGI 528 | ENGINEERING ECONOMICS | 3
CEVE 529 / ENGI 529 | ETHICS AND ENGINEERING LEADERSHIP | 3
ECON 611 | GEOPOLITICS OF ENERGY | 4
or MGMT 611 | GEOPOLITICS OF ENERGY | 1.5
GLBL 543 | ENERGY GEOPOLITICS | 3
MGMT 561 | BUSINESS-GOVERNMENT RELATIONS | 1.5
MGMT 609 | ENERGY MARKETS IN TRANSITION | 1.5
MGMT 610 | FUNDAMENTALS OF THE ENERGY INDUSTRY | 1.5
MGMT 661 | INTERNATIONAL BUSINESS LAW | 3
MGMT 670 | OPERATIONS STRATEGY | 1.5
MGMT 676 | MISSION AND VALUES AS A LEADER IN ECONOMIC ACTIVITIES | 1.5
MGMT 721 | BUSINESS LAW | 1.5
MGMT 747 | REGULATORY ENVIRONMENT OF BUSINESS | 1.5
MGMT 758 | ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) ISSUES IN STRATEGY | 1.5
NSCI 515 | FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT | 3

#### Code | Title | Credit Hours
--- | --- | ---
BIOS 538 | ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA | 3
BIOS 558 | FUNDAMENTALS OF QUANTITATIVE ENVIRONMENTAL HEALTH RISK ASSESSMENT | 3
CEVE 521 | CLIMATE RISK MANAGEMENT | 3
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CEVE 528 /</td>
<td>ENGINEERING ECONOMICS</td>
<td>3</td>
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<tr>
<td>ENGI 528</td>
<td></td>
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<tr>
<td>CEVE 543</td>
<td>DATA-DRIVEN MODELS FOR CLIMATE HAZARD</td>
<td>3</td>
</tr>
<tr>
<td>DSCI 535 /</td>
<td>APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS</td>
<td>4</td>
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<td>COMP 549</td>
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<td>EEPS 584</td>
<td>DATA SCIENCE ENVIRONMENTAL AND GEOSCIENCES</td>
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<tr>
<td>EEPS 586</td>
<td>DATA SCIENCE METHODS AND DATA MANAGEMENT</td>
<td>3</td>
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<tr>
<td>EEPS 635</td>
<td>REMOTE SENSING</td>
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<td>EEPS 636</td>
<td>GIS FOR SCIENTISTS AND ENGINEERS</td>
<td>3</td>
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<td>EEPS 645</td>
<td>EARTH AND PLANETARY INTERIORS</td>
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<td>EEPS 699</td>
<td>GRAPHIC AND VISUAL DESIGN FOR SCIENTISTS</td>
<td>3</td>
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<td>MGMT 595</td>
<td>DATA ANALYSIS</td>
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<tr>
<td>MGMT 758</td>
<td>ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) ISSUES IN STRATEGY</td>
<td>1.5</td>
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<tr>
<td>NSCI 515</td>
<td>FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT</td>
<td>3</td>
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<tr>
<td>STAT 553</td>
<td>BIOSTATISTICS</td>
<td>3</td>
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<tr>
<td>STAT 605</td>
<td>R FOR DATA SCIENCE</td>
<td>3</td>
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<tr>
<td>or STAT 606</td>
<td>SAS STATISTICAL PROGRAMMING</td>
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<tr>
<td>STAT 615</td>
<td>REGRESSION AND LINEAR MODELS</td>
<td>3</td>
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</tbody>
</table>

**Policies for the MSEA Degree**

**Professional Science Master's Graduate Program Handbook**

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the Professional Science Master's Program publishes a graduate program handbook, which can be found here: [https://gradhandbooks.rice.edu/2023_24/Natural_Sciences_Professional_Masters_Graduate_Handbook.pdf](https://gradhandbooks.rice.edu/2023_24/Natural_Sciences_Professional_Masters_Graduate_Handbook.pdf)

**Admission**

Admission to graduate study in Environmental Analysis is open to qualified students holding a bachelor's degree in a related field that includes general biology, chemistry, calculus, differential equations, and linear algebra. Department faculty evaluate the previous academic record and credentials of each applicant individually.

**Transfer Credit**

For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

**Program Transfer Credit Guidelines**

Students pursuing the MSEA degree should be aware of the following program-specific transfer credit guidelines:

- No more than 2 courses (6 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards the degree.

**Additional Information**

Requests for transfer credit will be considered by the program director on an individual case-by-case basis.

**Opportunities for the MSEA Degree**

**Fifth-Year Master's Degree Option for Rice Undergraduate Students**

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this [Undergraduate - Graduate Concurrent Enrollment](https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/) opportunity, including specific information on the registration process can be found here.

Rice undergraduate students completing studies in science may have the option to pursue the Master of Science in Environmental Analysis (MSEA) degree. For additional information, students should contact their undergraduate major advisor, the faculty MSEA program director, and the Professional Science Master’s (PSM) program director.

**Additional Information**

For additional information, please see the Environmental Analysis website: [https://profms.rice.edu/](https://profms.rice.edu/)