

# 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/) (<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/) (<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.<sup>3</sup>
- 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/) (<https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/>). Additionally, these course substitutions 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

Code	Title	Credit Hours
Total Credit Hours Required for the MSEA Degree		39

## Degree Requirements

Code	Title	Credit Hours
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### Core Requirements

Core Science Courses		
BIOS 571	ENVIRONMENTAL MANAGEMENT	3
CEVE 501	CHEMISTRY FOR ENVIRONMENTAL ENGINEERING AND SCIENCE	3
or CEVE 510	PRINCIPLES OF ENVIRONMENTAL ENGINEERING	

Select 1 course from the following: 3

BIOS 538	ANALYSIS AND VISUALIZATION OF BIOLOGICAL DATA	
BIOS 558	FUNDAMENTALS OF QUANTITATIVE ENVIRONMENTAL HEALTH RISK ASSESSMENT	
CEVE 543	DATA-DRIVEN MODELS FOR CLIMATE HAZARD	
STAT 685	ENVIRONMENTAL STATISTICS AND DECISION MAKING	

Cohort Courses		
NSCI 501	PROFESSIONAL MASTER'S SEMINAR (2 semesters required, 1st semester)	1
NSCI 501	PROFESSIONAL MASTER'S SEMINAR (2 semesters required, 2nd semester)	1
NSCI 511	SCIENCE POLICY, AND ETHICS	3
NSCI 610 / ENGI 610	MANAGEMENT FOR SCIENCE AND ENGINEERING	3

### Elective Requirements

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

### Three to Six Month Full-Time Internship

A three to six month full-time internship is required<sup>3</sup>

NSCI 512	PROFESSIONAL MASTER'S PROJECT	1
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**Total Credit Hours** 39

## Footnotes and Additional Information

<sup>1</sup> 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.

<sup>2</sup> **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.

<sup>3</sup> **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. With approval of the advising faculty, a capstone project, independent study, or a research project can be used to fulfill the internship requirement. At the conclusion of the internship (or the conclusion of the capstone project, independent study, or research project), students must present a summary of their 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
<b>Environmental Sustainability</b>		
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	FLUID FLOW IN FRACTURED ROCKS	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
<b>Management and Policy</b>		
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	
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
<b>Quantitative Decision-Making</b>		
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
CEVE 528 / ENGI 528	ENGINEERING ECONOMICS	3
CEVE 543	DATA-DRIVEN MODELS FOR CLIMATE HAZARD	3
DSCI 535 / COMP 549	APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS	4
EEPS 584	DATA SCIENCE ENVIRONMENTAL AND GEOSCIENCES	3
EEPS 586	DATA SCIENCE METHODS AND DATA MANAGEMENT	3
EEPS 635	REMOTE SENSING	3
EEPS 636	GIS FOR SCIENTISTS AND ENGINEERS	3
EEPS 645	EARTH AND PLANETARY INTERIORS	3
EEPS 699	GRAPHIC AND VISUAL DESIGN FOR SCIENTISTS	3
MGMT 595	DATA ANALYSIS	3
MGMT 758	ENVIRONMENTAL, SOCIAL, AND GOVERNANCE (ESG) ISSUES IN STRATEGY	1.5
NSCI 515	FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT	3
STAT 553	BIOSTATISTICS	3
STAT 605 or STAT 606	R FOR DATA SCIENCE SAS STATISTICAL PROGRAMMING	3
STAT 615	REGRESSION AND LINEAR MODELS	3
STAT 685	ENVIRONMENTAL STATISTICS AND DECISION MAKING	3

## 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/2024\\_25/Natural\\_Sciences\\_Professional\\_Masters\\_Graduate\\_Handbook.pdf](https://gradhandbooks.rice.edu/2024_25/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 \(https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer\)](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). Some departments and

programs have additional restrictions on transfer credit. Requests for transfer credit must be approved for Rice equivalency by the appropriate academic department offering the Rice equivalent course (corresponding to the subject code of the course content) and by the Office of Graduate and Postdoctoral Studies (GPS). 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 guideline:

- 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

For additional information, please see the Environmental Analysis website: <https://profms.rice.edu/>.

## 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* opportunity, including specific information on the registration process can be found [here \(https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/\)](https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

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/>.