ENVIRONMENTAL SCIENCE, BS

Banner Code: SC-BS-EVSC

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The Environmental Science, BS provides students with rigorous training in the fundamental science of the environment and in the application of key scientific principles to the analysis of environmental processes and problems. Subsequently, the program introduces students to the development of practical responses to those problems. The program covers ecological systems, environmental policy, fundamental techniques of environmental science and engineering, protection and improvement of environmental quality, and public and private decision-making processes. Graduates of the program are prepared to undertake careers in a variety of environmental science fields, and are also qualified to pursue advanced scientific/professional education.

This is a Green Leaf program (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/).

Concentrations

Students select a concentration in:

- Conservation
- Ecological Science
- Environmental Health
- Human and Ecosystem Response to Climate Change
- Marine, Estuarine and Freshwater Ecology
- Wildlife

Admissions & Policies

Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies (http://catalog.gmu.edu/admissions/undergraduate-policies/) section of this catalog.

To apply for this program, please complete the George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/apply-now/).

Policies

Students must fulfill all Requirements for Bachelor's Degrees (http://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2), including the Mason Core (http://catalog.gmu.edu/mason-core/).

Students can fulfill the writing intensive requirement for this major by taking EVPP 337 Environmental Policy Making in Developing Countries.

For policies governing all undergraduate programs, see AP.5 Undergraduate Policies (http://catalog.gmu.edu/policies/academic/undergraduate-policies/).

Requirements

Degree Requirements

Total credits: minimum 120

This is a Green Leaf program.

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Please note that all CONS courses are offered through the Smithsonian-Mason Semester (https://catalog.gmu.edu/colleges-schools/humanities-social-sciences/smithsonian-mason-conservation/#text).

Core Requirements

All students complete the following core courses:

Environmental Science

Code	Title	Credits
EVPP 210	Environmental Biology: Molecules and Cells	4
EVPP 301	Environmental Science: Biological Diversity and Ecosystems	4
EVPP 302	Environmental Science: Biomes and Human Dimensions	4
EVPP 305	Environmental Microbiology Essentials	3
EVPP 306	Environmental Microbiology Essentials Laboratory	1
EVPP 337	Environmental Policy Making in Developing Countries [1]	3
EVPP 361	Introduction to Environmental Policy	3
EVPP 377	Applied Ecology	3
EVPP 430	Fundamentals of Environmental Geographic Information Systems	3
BIOL 214	Biostatistics for Biology Majors	4
Select one from the following:		3
EVPP 336	Human Dimensions of the Environment	
EVPP 338	Economics of Environmental Policy	
EVPP 362	Intermediate Environmental Policy	
EVPP 475	Global Biodiversity Governance	
Select one from the following:		3-4
EVPP 378	RS: Ecological Sustainability (Mason Core) (http://catalog.gmu.edu/mason-core/)	
EVPP 401	Integrated Environmental Assessment	
EVPP 480	Sustainability in Action (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CONS 490	RS: Integrated Conservation Strategies (Mason Core) (http://catalog.gmu.edu/mason-core/)	
Total Credits		38-39

[1] Fulfills the writing intensive requirement.

Chemistry

Code	Title	Credits
CHEM 211	General Chemistry I (Mason Core) (http://catalog.gmu.edu/mason-core/)	3
CHEM 213	General Chemistry Laboratory I (Mason Core) (http://catalog.gmu.edu/mason-core/)	1
CHEM 212	General Chemistry II (Mason Core) (http://catalog.gmu.edu/mason-core/)	3
CHEM 214	General Chemistry Laboratory II (Mason Core) (http://catalog.gmu.edu/mason-core/)	1
Total Credits		8

Mathematics

Code	Title	Credits
Select two from the following:		7-8
MATH 111	Linear Mathematical Modeling (Mason Core) (http://catalog.gmu.edu/mason-core/)	
MATH 113	Analytic Geometry and Calculus I (Mason Core) (http://catalog.gmu.edu/mason-core/)	
MATH 114	Analytic Geometry and Calculus II	
Total Credits		7-8

Geology

Code	Title	Credits
GEOL 102	Historical Geology (Mason Core) (http://catalog.gmu.edu/mason-core/)	4
Total Credits		4

Information Technology

Code	Title	Credits
CDS 130	Computing for Scientists	3
Total Credits		3

Experiential Learning

Code	Title	Credits
Select at least one from the following:		1-6
EVPP 395	Undergraduate Research in Environmental Science and Policy	
EVPP 494	Internship	
CONS 496	Research in Conservation (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CONS 498	Internship	
Total Credits		1-6

Concentration in Conservation (CNSV)

Code	Title	Credits
Select at least 21 credits from the following:		21
EVPP 318	Conservation Biology	
EVPP 378	RS: Ecological Sustainability (Mason Core) (http://catalog.gmu.edu/mason-core/)	
EVPP 395	Undergraduate Research in Environmental Science and Policy	
EVPP 396	Directed Topic in Environmental Science and Policy [1]	
EVPP 419	Marine Mammal Biology and Conservation	
EVPP 420	Marine Mammal Biology and Conservation Field Course	
EVPP 421	Marine Conservation	
EVPP 427	Conservation Medicine	
EVPP 440	Field Environmental Science [1]	
EVPP 475	Global Biodiversity Governance	
EVPP 490	Special Topics in Environmental Science and Policy [1]	
EVPP 494	Internship	
BIOL 300	BioDiversity	
BIOL 435	Selected Topics in Biology [1]	
GGS 303	Geography of Resource Conservation (Mason Core) (http://catalog.gmu.edu/mason-core/)	
GGS 307	Geographic Approaches for Sustainable Development	
CONS 320	Conservation in Practice	
CONS 400	Conservation Seminar	
CONS 401	Conservation Theory	
CONS 402	Applied Conservation	
CONS 404	Biodiversity Monitoring	
CONS 405	Landscape and Macrosystems Ecology	
CONS 406	Small Population Management	
CONS 410	Human Dimensions in Conservation (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CONS 490	RS: Integrated Conservation Strategies (Mason Core) (http://catalog.gmu.edu/mason-core/) (Synthesis course)	
CONS 491	RS: Conservation Management Planning (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CONS 497	Special Topics in Conservation	
CONS 499	Independent Study/Research	
INTS 311	The Mysteries of Migration: Consequences for Conservation (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PRLS 300	People with Nature	
PRLS 402	Human Behavior in Natural Environments	
Alternative courses may be taken as approved by the program coordinator.		
Total Credits		21

[1] In a relevant topic.

Concentration in Ecological Science (ECSI)

Code	Title	Credits
Select at least 21 credits from the following:		21
EVPP 309	Introduction to Oceanography	
EVPP 350	Freshwater Ecosystems	

EVPP 355	Ecological Engineering and Ecosystem Restoration
EVPP 378	RS: Ecological Sustainability (Mason Core) (http://catalog.gmu.edu/mason-core/)
EVPP 395	Undergraduate Research in Environmental Science and Policy
EVPP 396	Directed Topic in Environmental Science and Policy [1]
EVPP 408	Mushrooms, Molds and Society
EVPP 427	Conservation Medicine
EVPP 440	Field Environmental Science [1]
EVPP 449	Marine Ecology
EVPP 490	Special Topics in Environmental Science and Policy [1]
EVPP 494	Internship
BIOL 300	BioDiversity
BIOL 345	Plant Ecology
BIOL 435	Selected Topics in Biology [1]
BIOL 459	Fungi and Ecosystems
GEOL 305	Environmental Geology
GEOL 306	Soil Science
GGS 307	Geographic Approaches for Sustainable Development
Alternative courses may be taken as approved by the program coordinator.	
Total Credits	21

[1] In a relevant topic.

Concentration in Environmental Health (EVHL)

Code	Title	Credits
Required Courses		
EVPP 427	Conservation Medicine	3
EVPP 445	Principles of Environmental Toxicology	3
Course Options		
Select at least 15 credits from the following		15
EVPP 395	Undergraduate Research in Environmental Science and Policy	
EVPP 396	Directed Topic in Environmental Science and Policy [1]	
EVPP 409	Medical Mycology	
EVPP 440	Field Environmental Science [1]	
EVPP 490	Special Topics in Environmental Science and Policy [1]	
EVPP 494	Internship	
EVPP 515	Molecular Environmental Biology I	
BIOL 305 & BIOL 306	Biology of Microorganisms and Biology of Microorganisms Laboratory	
BIOL 402	Applied and Industrial Microbiology	
BIOL 404	Medical Microbiology	
BIOL 465	Histology	
GGS 302	Global Environmental Hazards	
GGS 304	Population Geography (Mason Core) (http://catalog.gmu.edu/mason-core/)	
GGS 307	Geographic Approaches for Sustainable Development	
GGS 319	Air Pollution	
GGS 322	Issues in Global Change	
GCH 205	Global Health (Mason Core) (http://catalog.gmu.edu/mason-core/)	
GCH 360	Health and Environment	
GCH 560	Environmental Health	
Alternative courses may be taken as approved by the program coordinator.		
Total Credits		21

[1] In a relevant topic.

Concentration in Human and Ecosystem Response to Climate Change (HERC)

Code	Title	Credits
Required Course		
EVPP 336	Human Dimensions of the Environment	3
Course Options		
Select at least 18 credits from the following:		18
EVPP 309	Introduction to Oceanography	
EVPP 355	Ecological Engineering and Ecosystem Restoration	
EVPP 378	RS: Ecological Sustainability (Mason Core) (http://catalog.gmu.edu/mason-core/)	
EVPP 395	Undergraduate Research in Environmental Science and Policy	
EVPP 396	Directed Topic in Environmental Science and Policy	
EVPP 427	Conservation Medicine	
EVPP 432	Energy Policy	
EVPP 436	The Human Dimensions of Global Climate Change	
EVPP 440	Field Environmental Science	
EVPP 475	Global Biodiversity Governance	
EVPP 490	Special Topics in Environmental Science and Policy	
EVPP 494	Internship	
CLIM 101	Global Warming: Weather, Climate, and Society (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CLIM 111	Introduction to the Fundamentals of Atmospheric Science (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CLIM 112	Introduction to the Fundamentals of Atmospheric Science Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)	
CLIM 312	Physical Climatology	
CLIM 314	Severe and Extreme Weather	
CLIM 319	Air Pollution	
CLIM 412	Physical Oceanography	

CLIM 438	Atmospheric Chemistry	
GEOL 309	Introduction to Oceanography	
GGS 121	Dynamic Atmosphere and Hydrosphere (Mason Core) (http://catalog.gmu.edu/mason-core/)	
GGS 302	Global Environmental Hazards	
GGS 304	Population Geography (Mason Core) (http://catalog.gmu.edu/mason-core/)	
GGS 307	Geographic Approaches for Sustainable Development	
GGS 309	Meteorology and Climate	
GGS 312	Physical Climatology	
GGS 314	Severe and Extreme Weather	
GGS 319	Air Pollution	
GGS 321	Biogeography	
GGS 322	Issues in Global Change	
GGS 354	Data Analysis and Global Change Detection Techniques	
GGS 456	Introduction to Atmospheric Radiation	
Alternative courses may be taken as approved by the program coordinator.		
Total Credits		21

[1] In a relevant topic.

Concentration in Marine, Estuarine and Freshwater Ecology (MEFC)

Code	Title	Credits
Required Courses		
EVPP 309	Introduction to Oceanography	3
EVPP 350	Freshwater Ecosystems	4
EVPP 421	Marine Conservation	3
EVPP 449	Marine Ecology	3
Course Options		
Select at least 8 credits from the following:		8
EVPP 318	Conservation Biology	
EVPP 363	Coastal Morphology and Processes	
EVPP 395	Undergraduate Research in Environmental Science and Policy	
EVPP 396	Directed Topic in Environmental Science and Policy [1]	
EVPP 419	Marine Mammal Biology and Conservation	
EVPP 420	Marine Mammal Biology and Conservation Field Course	
EVPP 427	Conservation Medicine	
EVPP 440	Field Environmental Science [1]	
EVPP 490	Special Topics in Environmental Science and Policy [1]	
EVPP 494	Internship	
BIOL 331	Invertebrate Zoology	
BIOL 480	The Diversity of Fishes	
GEOL 364	Marine Geology	
GEOL 458	Chemical Oceanography	
GGS 307	Geographic Approaches for Sustainable Development	
CLIM 412	Physical Oceanography	
INTS 318		
Alternative courses may be taken as approved by the program coordinator.		
Total Credits		21

[1] In a relevant topic.

Concentration in Wildlife (WILD)

Code	Title	Credits
Wildlife Courses		
EVPP 318	Conservation Biology	3
BIOL 460	Infectious Diseases Wildlife	3
Choose one course from the following:		3-4
EVPP 395	Undergraduate Research in Environmental Science and Policy [1]	
EVPP 396	Directed Topic in Environmental Science and Policy [1]	
EVPP 419	Marine Mammal Biology and Conservation	
EVPP 494	Internship [1]	
BIOL 437	Orinthology	
BIOL 438	Mammalogy	
BIOL 439	Herpetology	
Zoology Courses		
Choose one course from the following:		3-4
EVPP 395	Undergraduate Research in Environmental Science and Policy [2]	
EVPP 396	Directed Topic in Environmental Science and Policy [2]	
EVPP 427	Conservation Medicine	
EVPP 494	Internship [2]	
BIOL 311	General Genetics	
BIOL 331	Invertebrate Zoology	
BIOL 332	Insect Biology	
Botany Courses		
Choose from the following courses:		9
EVPP 395	Undergraduate Research in Environmental Science and Policy [3]	
EVPP 396	Directed Topic in Environmental Science and Policy [3]	
EVPP 494	Internship [3]	
BIOL 140	Plants and People (Mason Core) (http://catalog.gmu.edu/mason-core/)	
BIOL 304	Plant Biology	
BIOL 344	Plant Diversity and Evolution	
BIOL 345	Plant Ecology	
INTS 402	Plants and People - Sustenance, Ceremony, and Sustainability	
Total Credits		21-23

1 In a topic relevant to wildlife.

2 In a topic relevant to zoology.

3 In a topic relevant to botany.

Mason Core and Elective Credits

In order to meet a minimum of 120 credits, this degree requires additional credits (specific credit counts by concentration are shown below), which may be applied toward any remaining Mason Core (http://catalog.gmu.edu/mason-core/) requirements (outlined below), Requirements for Bachelor's Degrees (http://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2), and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

- CNSV Concentration: 31-38 credits
- ESCI Concentration: 31-38 credits
- EVHL Concentration: 31-38 credits
- HERC Concentration: 31-38 credits
- MEFC Concentration: 31-38 credits
- WILD Concentration: 29-38 credits

Mason Core

Some Mason Core (http://catalog.gmu.edu/mason-core/) requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core (http://catalog.gmu.edu/mason-core/) requirements.

Code	Title	Credits
Foundation Requirements		
Written Communication (ENGH 101) (http://catalog.gmu.edu/mason-core/#written)		3
Oral Communication (http://catalog.gmu.edu/mason-core/#oral)		3
Quantitative Reasoning (http://catalog.gmu.edu/mason-core/#quantitative)		3
Information Technology and Computing (http://catalog.gmu.edu/mason-core/#information-technology)		3
Exploration Requirements		
Arts (http://catalog.gmu.edu/mason-core/#arts)		3
Global Understanding (http://catalog.gmu.edu/mason-core/#global)		3
Literature (http://catalog.gmu.edu/mason-core/#literature)		3
Natural Science (http://catalog.gmu.edu/mason-core/#natural-science)		7
Social and Behavioral Sciences (http://catalog.gmu.edu/mason-core/#social-behavioral-science)		3
Western Civilization/World History (http://catalog.gmu.edu/mason-core/#western-civilization-world-history)		3
Integration Requirements		
Written Communications (ENGH 302) (http://catalog.gmu.edu/mason-core/#written)		3
Writing-Intensive (http://catalog.gmu.edu/mason-core/#wi) [1]		3
Synthesis/Capstone (http://catalog.gmu.edu/mason-core/#synthesis-capstone) [2]		3
Total Credits		40

1 Most programs include the writing-intensive course designated for the major as part of the major requirements; this course is therefore not counted towards the total required for Mason Core.

2 Minimum 3 credits required.

Accelerated Master's

Bachelor's Degree (selected)/ Environmental Science and Policy, Accelerated MS

Overview

This degree option allows highly qualified George Mason University students to earn an Environmental Science and Policy, MS (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/environmental-science-policy-ms/) in less time than if they had first graduated with an environmentally-focused Green Leaf-designated (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/) BA or BS degree and then applied to the MS program sequentially.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate programs, see AP.6 Graduate Policies (http://catalog.gmu.edu/policies/academic/graduate-policies/).

Admission Requirements

Students with an overall GPA of at least 3.20 who are pursuing any Green Leaf-designated (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/) major or minor may apply for provisional acceptance into this accelerated master's program after completing two semesters of chemistry (including CHEM 211 General Chemistry I (Mason Core) (http://catalog.gmu.edu/mason-core/) and CHEM 212 General Chemistry II (Mason Core) (http://catalog.gmu.edu/mason-core/) and three semesters of biology, including a course in ecology, or the equivalent, for example:

Code	Title	Credits
Select one of the following options:		13
Option 1:		
BIOL 213	Cell Structure and Function (Mason Core) (http://catalog.gmu.edu/mason-core/)	
BIOL 214	Biostatistics for Biology Majors	
BIOL 308	Foundations of Ecology and Evolution	
Option 2:		
EVPP 210	Environmental Biology: Molecules and Cells	
EVPP 301	Environmental Science: Biological Diversity and Ecosystems	
EVPP 302	Environmental Science: Biomes and Human Dimensions	
EVPP 305	Environmental Microbiology Essentials	
EVPP 306	Environmental Microbiology Essentials Laboratory	
Option 3:		
CONS 401	Conservation Theory	

CONS 402	Applied Conservation
6 credits of BIOL or CONS electives	

By the beginning of the undergraduate's senior year, they should first submit a Graduate Application for Accelerated Master's Program form (obtained from the Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us/)). Secondly, in their senior year accelerated master's students must complete the two graduate courses indicated on their Accelerated Master's Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. Upon completion and conferral of the undergraduate degree in a Green Leaf-designated (http://catalog.gmu.edu/student-services/green-leaf-programs-courses/) program, in the semester indicated in the application, they must additionally submit the Bachelor's/Accelerated Master's Transition form (found on the Office of the University Registrar website (http://registrar.gmu.edu/forms/)) and will subsequently be admitted into graduate status.

By at least the beginning of their senior year, they should seek out a faculty member in the Department of Environmental Science and Policy (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/#facultytext) who is willing to serve as their advisor. This advisor will aid the student in choosing the appropriate graduate courses to take and help to prepare the student for graduate studies. Admission into a research-oriented master's concentration is dependent upon securing the agreement of a faculty advisor. Faculty from a variety of departments and colleges at George Mason (called "program faculty") can serve as master's advisors. Potential students are encouraged to speak with the graduate program coordinator in the department to obtain guidance on this issue.

Application Requirements

Applicants to all graduate programs at Mason must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (http://catalog.gmu.edu/admissions/graduate-policies/) section of this catalog, *excluding* the GRE exam requirement (which is not required for those enrolled in the accelerated program). This includes three letters of recommendation (at least one from a former professor or someone with a PhD), a recent resume, a statement of interest/research goals and interests (including information on the candidate's proposed MS research), and a letter from their advisor stating that the advisor agrees to take on the candidate as an MS student, how the candidate would be a good fit for them and why candidate's research topic would be suitable.

For information specific to the accelerated Environmental Science and Policy, MS (http://catalog.gmu.edu/colleges-schools/science/environmental-policy/environmental-science-policy-ms/), see Graduate Admissions on the department's website (http://esp.gmu.edu/academic-programs/graduate/admissions/).

Reserve Graduate Credits

Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of appropriate environmentally-focused graduate coursework may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 GPA in these classes, they are granted advanced standing in the master's program and must then complete an additional 27 credits to receive the master's degree.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition form found on the Office of the University Registrar website (http://registrar.gmu.edu/forms/) (as noted above).

Students may take up to 6 additional environmentally-focused graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree but will reduce the subsequent master's degree credits accordingly (e.g., with 6 credits counted towards undergraduate degree plus the maximum 6 reserve credits, an MS could be completed with 21 post-bachelor's credits). The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department.