

Program Change Request

Date Submitted: 12/02/19 1:57 pm

Viewing: **SC-MS-EVSP : Environmental Science and Policy, MS**

Last approved: 11/25/19 2:45 pm

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Changes proposed by: jbazaz

[Environmental Science and Policy, MS](#)

Catalog Pages

Using this Program

In Workflow

1. **ESP Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. SC CAT Editor
5. Assoc Provost-Graduate
6. Registrar:Concentration Code
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Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Jennifer Sklarew	2012	jsklarew

Effective Catalog: 2020-2021

Program Level: Graduate

Program Type: Master's

Degree Type: Master of Science

Title: Environmental Science and Policy, MS

Banner Title: MS Environmental Sci & Policy

Registrar/OAPI Use Only – SCHEV Status: Approved

Registrar's Office Use Only – Program Start Term

Registrar/OAPI Use Only – SCHEV

Approval Path

1. 12/02/19 2:20 pm
A. Alonso Aguirre (aaguirr3):
Approved for ESP Chair

History

1. Nov 8, 2017 by
clmig-jwehrheim
2. Feb 28, 2018 by
Rebekah Zacharias (rzachari)

**Jointly Owned
Program?**

No

Justification

Creation of this MS concentration in energy and sustainability policy and science responds to two related drivers: strong student interest and relevant career trends.

Student interest serves as the first driver behind creation of the new concentration. Prospective and current students have expressed strong interest in an MS concentration in energy and sustainability policy and science. At least ten prospective students have contacted the Department of Environmental Science and Policy (ESP) in the past three years seeking an MS program in energy and sustainability. These students applied to other programs upon learning that COS has no such program. In addition, results from a two-question survey sent to 70 students confirmed interest in an energy and sustainability policy and science MS concentration. The survey asked the following: 1) Would you, or others you know, be interested in an MS concentration focused on energy and sustainability policy, science and methods? 2) If so, why? All of the respondents expressed interest in an MS concentration in energy and sustainability policy and science, or they knew of others who would be interested.

The following is an example of a survey response from an undergraduate student considering graduate school:

“I personally would be interested in such a concentration if it was offered. As a student in environmental science and policy, I wanted to pursue the most relevant topics related to the world’s current issues in environmentalism. Given the basis of my concentration in Ecological Science, I have learned how much of the current issues we face are tied to energy consumption and production. This is found in our consumption of every consumer good including but not limited to clothing, food, clean water, and consumer goods which require energy (smart phones, kitchen sets, and now electric cars). Understanding how current policy affects the sustainability of this energy consumption, and how science is helping to transform those policies to be even more sustainable, would be of utmost use to me and other peers who wish to effect change in this regard. This also would allow peers within our department to gain the skills and academic acumen to prepare themselves to pursue careers in energy policy and business. I would look forward to seeing such a concentration at GMU, and see our university become a leader in this emerging field of study.”

The following is an example of a survey response from a former student who recently completed an accelerated Master's in COS:

“That sounds like a great concentration! If I was still taking classes at Mason I would be interested in that. I think that it would give students a well rounded view of sustainability issues and how to go about researching and applying that research to make policy changes. In the field of sustainability policy after college, knowledge of the hard science, process of research, as well as process of policy change is necessary to make effective changes.”

Linked to this strong student interest is evidence of career trends shifting toward energy and sustainability policy and science, the second driver behind the creation of this new concentration. The variety of careers and numbers of jobs in the energy and sustainability fields are increasing, as reflected in the Bureau of Labor Statistics (BLS) Occupational Outlook Handbook, which states that “Increasing demand for expertise in the sciences, particularly in occupations involved in...energy management and environmental protection, is projected to result in employment growth.” In particular, jobs for environmental scientists and specialists are predicted to grow eight percent from 2018-2028, which is noted as faster than the average for all occupations. (<https://www.bls.gov/ooh/life-physical-and-social-science/mobile/environmental-scientists-and-specialists.htm>) The BLS handbook further notes that “Heightened public interest in the hazards facing the environment, as well as increasing demands placed on the environment by population growth, are expected to spur demand for environmental scientists and specialists.” Examples of jobs BLS lists include climate change analysts, environmental health and safety specialists, environmental restoration planners, and industrial ecologists. All of these positions include energy and sustainability elements.

The skill sets needed for mid-level and senior positions in these careers include energy and sustainability policy and science, as well as training in quantitative, qualitative, and other methods, such as GIS. An energy and sustainability policy and science MS concentration will enable students to focus on the policy, science and methods needed to make them competitive for these positions. While BS programs can provide the basics for an entry-level position, an MS focused specifically on these skills enables graduates to emerge with the advanced training necessary for more senior positions in energy and environmental consulting and NGOs, energy and sustainability-focused government offices, and private sector firms focused on energy and sustainability. The BLS handbook notes that “a master's degree may be needed for

advancement” beyond entry level positions in this field; thus, the energy and sustainability policy and science concentration will help graduates to advance their careers even if they already have secured an entry level position in one of these fields. Such positions include senior roles in energy, environmental and sustainability consulting firms, as well as private sector and university supervisory roles such as energy and sustainability manager and corporate sustainability director. Entering the federal government at a GS-9 level or higher requires a Master’s degree, as stated on the USAJobs website. The new MS concentration will enable graduates to competitively apply for professional positions at agencies such as the Departments of Energy and Interior, the U.S. Geological Survey, and the Environmental Protection Agency.

The energy and sustainability policy and science MS concentration thus will place Mason at the forefront of the movement to meet student demand for academic credentials not offered by many U.S. universities. The concentration will enable Mason to gain a competitive advantage in attracting students from a variety of disciplines and prepare them for an increasingly diverse and growing range of careers in the energy and sustainability fields.

Total Credits Required: Total credits: 33

Registrar's Office Use Only - Program Code:

SC-MS-EVSP

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in [Graduate Admissions Policies](#). Additionally, information on the admission of international students can be found in [Admission of International Students](#).

To apply for this program, please complete the [George Mason University Admissions Application](#).

Eligibility

Applicants should hold a bachelor's degree from a regionally-accredited institution with a GPA of 3.00 in natural or Earth sciences, engineering, resource planning, environmental studies, or a field that leads to an environmental focus.

Applicants should have taken at least two semesters of chemistry and three semesters of biology, including a course in ecology. Applicants who lack this coursework should contact the graduate coordinator's office for advice. Successful completion of a two-semester sequence of introductory graduate-level environmental chemistry and biology courses can be used to satisfy the biology and chemistry prerequisites for admission. These introductory courses would be in addition to the requirements for the degree.

Application Requirements

Applicants should submit the following:

- Completed George Mason University [George Mason University Admissions Application](#).
- Three letters of recommendation, including at least one from a former professor or, if not available, from someone with a PhD.
- The GRE is required. Successful applicants usually have achieved a minimum score of 235/336 (70%) for verbal and quantitative combined.
- Statement of interest indicating: Desired concentration, potential areas of environmental focus/research interest, interactions with potential faculty advisors, and career goals.
- Contact a potential George Mason faculty advisor (appropriate for research interests). An endorsement letter from the potential advisor must be sent to the [Department of Environmental Science and Policy](#)'s graduate office; the availability of an advisor in the student's area of interest is a prerequisite for admission.

Program-Specific Policies:

Policies

For policies governing all graduate programs, see [AP.6 Graduate Policies](#).

Course Selections

Some program requirements may be fulfilled by completing courses from a variety of academic units at Mason. A student's course selections should reflect a coherent individual program focus, which is stated and briefly described in the program of study. Course selections should also support the research component of the student's degree program (if applicable) and should be developed in close consultation with the supervisory committee. The supervisory committee approves a coursework program (the program of study) individually for each student.

In special cases, the graduate program director may permit the substitution of an alternative course in place of a required one.

Supervisory Committee

Students must form a supervisory committee and submit a program of study to the graduate coordinator for approval within the first 9 credits of coursework or by the end of the second semester, whichever comes first.

The supervisory committee consists of the advisor and at least two other members, chosen in consultation with the advisor, and must conform to [AP.6.9](#)

Requirements for Master's Degrees.

Degree Requirements:

This is a Green Leaf program.

Students should refer to [Admissions & Policies](#) for specific policies related to this program.

Students may select for their degree to culminate in either a research project (3 credits) or a thesis (3-6 credits). The concentration credit amount requirements below are directly related to this selection of either a research project or thesis.

Students in all of the concentrations will complete the concentration's requirements and the research requirement with a minimum of 33 credits.

Core Courses

Course List

Code	Title	Credits
Science Courses		
Choose 3 credits from the following:		3
EVPP 518	Conservation Biology	
EVPP 607	Fundamentals of Ecology	
EVPP 648	Population Ecology	
Statistics Courses		
Choose 3 credits from the following:		3
EVPP 632	Qualitative Research Methods for Environmental Scientists	
EVPP 651	Multivariate Data Analysis for Ecology and Environmental Science	
SOCI 620	Methods and Logic of Social Inquiry	
STAT 554	Applied Statistics I	
Policy Courses		
Choose 3 credits from the following:		3
EVPP 524	Introduction to Environmental and Resource Economics	
EVPP 608	Introduction to Environmental Social Science	
EVPP 635	Environment and Society	
EVPP 642	Environmental Policy	
Science and Policy Courses		
Choose 3 credits from the following:		3
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	
EVPP 670	Environmental Law	

Code	Title	Credits
Seminar Courses		
EVPP 692	Master's Seminar in Environmental Science and Public Policy	1
EVPP 991	Advanced Seminar in Environmental Science (When the topic is: Experimental Design for Environmental Scientists)	2
Research Requirement		3-6
<p>The research requirement may be satisfied in one of two ways: A research project or a formal thesis. The depth and sophistication of the research differs between the two options. The thesis normally involves original research with independent acquisition and interpretation of data, with the goal of peer-reviewed publication. Projects are generally less extensive and can include a broader range of activities. Choose from one of the following:</p>		
Research Project Option		
<p>Students fulfilling the research requirement with the project option register for EVPP 798 Master's Research Project in Environmental Science and Public Policy and are required to take a comprehensive examination covering knowledge mastered throughout the program of study. This examination includes both a written and an oral component and is administered by the student's supervisory committee.</p>		
EVPP 798 Master's Research Project in Environmental Science and Public Policy (3 credits)		
Thesis Option		
<p>Students fulfilling the research requirement with the thesis option register for EVPP 799 Master's Thesis in Environmental Science and Public Policy, present their results in a public seminar, and defend their thesis before their supervisory committee. Students will be graded "Satisfactory/No Credit" on the research requirement.</p>		
EVPP 799 Master's Thesis in Environmental Science and Public Policy (3-6 credits)		
Electives		
<p>If necessary, students must take additional electives or concentration courses to bring the degree total to 33 credits. These courses must be approved by the student's supervisory committee and outlined on the student's program of study.</p>		
Total Credits		18-21

Aquatic Ecology Concentration (AQEC)

This concentration will provide students with a well-grounded master's in the study of aquatic environments such as lakes, streams, watersheds, and estuaries. Emphasis is placed on food webs, biogeochemical cycles, water quality, habitat characteristics, and life histories of aquatic organisms. Students will become proficient with research tools including literature review, field and laboratory methods, and analytical tools as well as applications to management issues.

Aquatic Science

Course List

Code	Title	Credits
EVPP 550	Waterscape Ecology and Management	3
EVPP 581	Estuarine and Coastal Ecology	3
Choose 3-6 credits from the following:		3-6
EVPP 519	Marine Mammal Biology and Conservation	

Code	Title	Credits
EVPP 521	Marine Conservation	
EVPP 536	The Diversity of Fishes	
EVPP 545	Principles of Environmental Toxicology	
EVPP 549	Marine Ecology	
EVPP 563	Coastal Morphology and Processes	
EVPP 608	Introduction to Environmental Social Science	
EVPP 619	The Challenge of Biodiversity	
EVPP 623	Translating Environmental Policy into Action	
EVPP 635	Environment and Society	
EVPP 641	Environmental Science and Public Policy	
EVPP 642	Environmental Policy	
EVPP 643	Microbial Ecology	
EVPP 646	Wetland Ecology and Management	
EVPP 648	Population Ecology	
CLIM 512	Physical Oceanography	
Choose 3 credits from the following:		3
EVPP 515	Molecular Environmental Biology I	
EVPP 555	Lab in Waterscape Ecology	
EVPP 582	Estuarine and Coastal Ecology Laboratory	
EVPP 615	Molecular Environmental Biology II	
EVPP 647	Wetland Ecology Lab and Field	
EVPP 651	Multivariate Data Analysis for Ecology and Environmental Science	
GGS 653	Geographic Information Analysis	
STAT 554	Applied Statistics I	
Total Credits		12-15

Conservation Science and Policy Concentration (COSP)

This concentration is designed to foster an interdisciplinary, research-oriented degree focusing on the conservation of threatened species and habitats, integrating biological sciences and the human dimensions of conservation practice.

Students may take courses offered by the [Department of Environmental Science and Policy](#) and other departments, including CONS courses which are offered through the [Smithsonian Mason School of Conservation](#). This unique partnership with the Smithsonian-Mason School of Conservation (SMSC) in Front Royal, Virginia offers students hands-on education in cutting-edge conservation science and human dimensions through residential, intensive classes. SMSC is renowned for its

conservation research and training of conservation practitioners around the world and instructors for these classes are drawn from SMSC's conservation scientists and other experts from around the world.

Course List

Code	Title	Credits
EVPP 637	Human Dimensions of Climate Change	3
Choose 3 credits from the following:		3
EVPP 518	Conservation Biology	
EVPP 619	The Challenge of Biodiversity	
EVPP 621	Overview of Biodiversity Conservation	
Choose 3 credits from the following:		3
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	
EVPP 529	Environmental Science Communication	
Choose 3-6 credits from the following:		3-6
EVPP 515	Molecular Environmental Biology I	
EVPP 527	Disease Ecology and Conservation	
EVPP 607	Fundamentals of Ecology	
EVPP 615	Molecular Environmental Biology II	
EVPP 620	Development of U.S. Environmental Policies	
EVPP 623	Translating Environmental Policy into Action	
EVPP 648	Population Ecology	
GG5 553	Geographic Information Systems	
Total Credits		12-15

Environmental Science and Policy Concentration (EVSP)

The Environmental Science and Policy concentration is the largest within the master's and serves as a home for a broad array of research foci. It encourages an independent and creative approach to the development of curricula that reside in the general field of environmental science and policy.

Course List

Code	Title	Credits
Choose at least 3 credits from the following:		3
EVPP 527	Disease Ecology and Conservation	
EVPP 532	Animal Behavior	
EVPP 543	Tropical Ecosystems	
EVPP 648	Population Ecology	
Choose at least 3 credits from the following:		3

Code	Title	Credits
EVPP 531	Land-use Modeling Techniques and Applications	
EVPP 650	Ecosystem Analysis and Modeling	
STAT 525	Nonparametric Statistics and Categorical Data Analysis	
STAT 535	Analysis of Experimental Data	
Choose 6-9 credits from the following:		6-9
EVPP 521	Marine Conservation	
EVPP 533	Energy Policy	
EVPP 542	Urban Ecosystems Processes	
EVPP 550	Waterscape Ecology and Management	
EVPP 619	The Challenge of Biodiversity	
EVPP 622	Management of Wild Living Resources	
EVPP 623	Translating Environmental Policy into Action	
EVPP 641	Environmental Science and Public Policy	
EVPP 677	Applied Ecology and Ecosystem Management	
Total Credits		12-15

Environmental Science Communication Concentration (ESCM)

A key to environmental action and behavior change is an ability to communicate environmental science and policy. This concentration is for students desiring a master's degree with an interdisciplinary approach to communicating environmental issues and solutions.

Course List

Code	Title	Credits
EVPP 505	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	3
EVPP 529	Environmental Science Communication	3

Choose 3-6 credits from one of the following groupings: 3-6

Policy and Governance Grouping

- [EVPP 575](#) Global Biodiversity Governance
- [COMM 637](#) Risk Communication
- [GOVT 510](#) American Government and Politics
- [PUAD 540](#) Public Policy Process

Behavior Change Grouping

- [COMM 637](#) Risk Communication
- [COMM 660](#) Climate Change and Sustainability Communication Campaigns
- [COMM 670](#) Social Marketing

Code	Title	Credits
<u>COMM 706</u>	Strategic Communication	
Science in Society Grouping		
<u>EVPP 542</u>	Urban Ecosystems Processes	
<u>COMM 602</u>	Theories and Research of Mass Communication	
<u>COMM 639</u>	Science Communication	
<u>COMM 642</u>	Science and the Public	
<u>COMM 735</u>	Crisis Communication	
Choose at least 3 credits from the following:		3
<u>GG5 553</u>	Geographic Information Systems	
<u>GG5 681</u>	Social Media Analysis	
<u>COMM 650</u>	Research Methodologies in Communication	
<u>COMM 775</u>	Media Content Analysis	
<u>EDRS 811</u>	Quantitative Methods in Educational Research	
<u>EDRS 827</u>	Introduction to Measurement and Survey Development	
<u>POGO 511</u>	Introductory Data Analysis for Policy and Government	
<u>POGO 646</u>	Policy and Program Evaluation	
<u>PSYC 557</u>	Psychometric Methods	
<u>PSYC 611</u>	Advanced Statistics	
<u>SOCI 620</u>	Methods and Logic of Social Inquiry	
<u>SOCI 631</u>	Survey Research	
Total Credits		12-15

Environment and Management Concentration (EVM)

This concentration combines the managerial and administrative skills developed in a traditional master of public administration degree program with the scientific knowledge and understanding normally found in a master of science degree. It is especially meant for individuals working in or aspiring to work as managers in the environmental field in government or private industry.

Course List

Code	Title	Credits
<u>EVPP 641</u>	Environmental Science and Public Policy	3
<u>EVPP 677</u>	Applied Ecology and Ecosystem Management	3
Choose 3 credits from the following:		3
<u>EVPP 638</u>	Corporate Environmental Management and Policy	
<u>PUAD 502</u>	Administration in Public and Nonprofit Organizations	

Code	Title	Credits
Choose 3-6 credits from the following:		
<u>EVPP 505</u>	Selected Topics in Environmental Science (When the topic is "Evidence-based Policymaking: Using the Environmental Sciences for Governance")	3-6
<u>EVPP 524</u>	Introduction to Environmental and Resource Economics	
<u>EVPP 525</u>	Economics of Human/Environment Interactions	
<u>EVPP 529</u>	Environmental Science Communication	
<u>EVPP 533</u>	Energy Policy	
<u>EVPP 542</u>	Urban Ecosystems Processes	
<u>EVPP 545</u>	Principles of Environmental Toxicology	
<u>EVPP 550</u>	Waterscape Ecology and Management	
<u>EVPP 620</u>	Development of U.S. Environmental Policies	
<u>EVPP 646</u>	Wetland Ecology and Management	
<u>GG5 553</u>	Geographic Information Systems	
Total Credits		12-15

Energy and Sustainability Policy and Science (ESPS)

Many mid-level energy and sustainability positions in the public and private sectors require multidisciplinary grounding in science, policy, and methods. To provide such a foundation, this concentration combines the scientific knowledge normally acquired through a Master of Science degree with development of relevant policy and methods skills.

Course List

Code	Title	Credits
Required Foundation		
<u>EVPP 533</u>	Energy Policy	3
Choose one from the following:		
<u>EVPP 534</u>	Food-Energy-Water Nexus	3
<u>GG5 507</u>	Geographic Approaches for Sustainable Development	
Science		
Choose one from the following:		
<u>EVPP 542</u>	Urban Ecosystems Processes	3-4
<u>EVPP 677</u>	Applied Ecology and Ecosystem Management	
<u>GEOL 521</u>	Geology of Energy Resources	
<u>PHYS 581</u>	Topics in Renewable Energy	
<u>CEIE 501</u>	Sustainable Development	
Policy and Methods Electives		

Choose 1 or 2 from the following: 1

3-6

EVPP 505 Selected Topics in Environmental Science (When the topic is "Energy Law & Regulation," or "Fundamentals of Environmental GIS" (EVPP 505 can be taken twice if these two topics are taken separately))

EVPP 534 Food-Energy-Water Nexus

EVPP 503 Field Mapping Techniques

or **GEOL 553**Field Mapping Techniques

EVPP 638 Corporate Environmental Management and Policy

CSS 645 Spatial Agent-Based Models of Human-Environment Interactions

GG5 507 Geographic Approaches for Sustainable Development

ECON 695 Special Topics in Economics

Total Credits

12-16

1 Choose courses that have not already been taken.

Retroactive Requirements Updates:

Plan of Study:

Additional Program Information

This information is required by the Office of Accreditation and Program Integrity.

Courses offered via distance (if applicable):

What is the primary delivery format for the program? Face-to-Face Only

Does any portion of this program occur off-campus? No

Are you working with a vendor / other collaborators to offer your program? No

Related

Departments

Could this program prepare students for any type of professional licensure, in Virginia or elsewhere?

No

Are you adding or removing a licensure component?

No

Additional SCHEV & SACSCOC Information

Are you changing the total number of credits required for this program?

Are you changing the delivery format in any way (e.g adding an online option)?

Are you adding/removing a licensure option which was approved by SCHEV?

Will any portion of this program be offered at an off-campus location?

Are you adding significant new content areas to the program?

Will this program change affect any specialized accreditation?

Green Leaf Program Designation

Is this a Green Leaf program? Yes

Green Leaf Designation Sustainability-focused designation

Sustainability-focused academic programs require at least one green leaf course. Either that course is itself sustainability-focused or else the program requires a set of sustainability-related courses with aggregated substance equivalent to a sustainability-focused course.

Relationship to Existing Courses

Relationship to Existing Programs

List sustainability-focused courses currently required in the degree program:

Does this program cover material which crosses into another department?

No

Additional Attachments

SCHEV Proposal

Executive Summary

Reviewer Comments

Additional Comments

Is this course required of all students in this degree program?

%wi_required.eshtml%