

Program Approval Form

For approval of new programs and deletions or modifications to an existing program.

71

Action Requeste Create New (S Inactivate Exis Modify Existing Title (SCHE Concentra x Degree Re Admission Other Char	ed: CHEV approval ting g (check all that EV approval requ tion (Choose on quirements Standards/ Applinges:	required ex apply) uired excep re): / recation Rec	xcept for minors ot for minors) Add De quirements	s) elete [Mod	ify		/pe (Chec B.A. M.A. Ph.D. Undergra Graduate Other:	k one): X B.S. M.S. aduate Certifi c Certificate*	Minor M.Ed. cate*
College/School:	ence			Department:		ESP				
Submitted by:	Jen Gettys				Ext:	3.5302		Email:	jbazaz@g	mu.edu
Effective Term: Justification: (attac Adding "Mason Core equals 120 credits a	Fall 2015 ch separate docu e and Elective Cr nd how the Mase	ment if new redits" and on Core red	ase note: For st gram must be fu cessary) "Mason Core" s quirements can	tudents t illy appro ections i be fulfille	to be adr oved, ent in order t ed.	nitted to a ered into	new degree Banner, and e catalog list	, minor, ceri published ii ing clearly s	tricate or cor h the Univers how how the	centration, the ity Catalog.
			Exis	stina				New	/Modified	
Program Title: (Required) Title must identify subject matter. Do not include name of college/school/dept. Concentration(s):		Environm	nental Science,	BS						
Admissions Stand Application Requi (Required only if different listed in the University Ca	lards / rements: t from those atalog)									
Degree Requireme Consult University Catalo attach separate documer using track changes for n	ents: og for models, it if necessary nodifications	[Mason C	Core and Electiv	es sectio	on not ind	cluded]	See the bo attached.	ottom portion	n of the degre	e listing
Courses offered v (if applicable)	ia distance:									
TOTAL CREDITS	REQUIRED:									
*For Certificates C	Only: Indicate v	vhether st	tudents are ab	ole to pu	irsue or	a 🗌	Full-time	basis	Part-tim	ne basis
Approval Sig	natures									
Department	Da	ate	College/Scho	ool		Date	Pi Re	rovost's Officequired for Min	Ce ors and Interdis	Date ciplinary Programs

If this program may impact another unit or is in collaboration with another unit at Mason, the originating department must circulate this
proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.Unit NameUnit Approval NameUnit Approver's SignatureDate

	Onit Approver 3 Orginature	Date

For Graduate Programs Only

Graduate Council Member	Provost Office		Graduate Council Approval Date	
For Registrar Office's Use Only: Received	Banner	Catalog	revised 6/7/12	

Program Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL PROGRAMS (required)

Program Title: Environmental Science, BS

Date of Departmental Approval: 3/11/2015

FOR INACTIVATED PROGRAMS (required if inactivating a program)

• Reason for Inactivation:

FOR MODIFIED PROGRAMS (required if modifying a program)

- Summary of the Modification: Adding "Mason Core and Elective Credits" and "Mason Core" sections.
- Text before Modification (title, degree requirements, etc.): Sections weren't included.
- Text after Modification (title, degree requirements, etc.): See attached.
- Reason for the Modification: In order to have the catalog listing clearly show how the degree equals 120 credits and how the Mason Core requirements can be fulfilled.

FOR NEW PROGRAMS (required if creating a new program)

- Reason for the New Program:
- Relationship to Existing Programs:
- Relationship to Existing Courses:
- Semester of Initial Offering:
- Insert Tentative SCHEV Proposal Below

Acalog ACMS™

2015-2016 University Catalog {working}

Environmental Science, BS

Banner Code: SC-BS-EVSC

This program of study is offered by the <u>Department of Environmental Science and Policy</u> in the <u>College of Science</u>.

The <u>Environmental Science</u>, <u>BS</u> provides students with rigorous training in the fundamental science of the environment, and the application of the key scientific principles to the analysis of environmental processes and problems and to the development of practical



responses to those problems. The program covers ecological systems, environmental policy and the 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.

Students select a concentration in conservation, ecological science, environmental health, human and ecosystem response to climate change, or marine, estuarine and freshwater ecology. Through the coursework below, environmental science majors satisfy the <u>Mason Core</u> requirements in 'Natural Science', 'Quantitative Reasoning', and 'Synthesis'. Students can fulfill the writing intensive requirement for this major by taking <u>EVPP 337</u>.

Students must fulfill all requirements for bachelor's degrees including the Mason Core.

For policies governing all undergraduate degrees, see the Academic Policies section of the catalog.

This has been designated a Green Leaf program. For further information, please visit Green Leaf Programs and Courses.

Degree Requirements

Core Requirements

Environmental Science (38-39 credits)

- EVPP 210 Environmental Biology: Molecules and Cells Credits: 4
- EVPP 301 Environmental Science: Biological Diversity and Ecosystems Credits: 4
- EVPP 302 Environmental Science: Biomes and Human Dimensions Credits: 4
- EVPP 305 Environmental Microbiology Essentials Credits: 3
- EVPP 306 Environmental Microbiology Essentials Laboratory Credits: 1
- EVPP 337 Environmental Policy Making in Developing Countries Credits: 3
- EVPP 361 Introduction to Environmental Policy Credits: 3
- EVPP 377 Applied Ecology Credits: 3
- EVPP 430 Fundamentals of Environmental Geographic Information Systems Credits: 3
- BIOL 214 Biostatistics for Biology Majors Credits: 4

And one of the following three courses:

- EVPP 336 Human Dimensions of the Environment Credits: 3
- EVPP 338 Economics of Environmental Policy Credits: 3
- EVPP 362 Intermediate Environmental Policy Credits: 3

And one of the following four courses (all but EVPP 378 are Mason Core: Synthesis courses):

- EVPP 335 People, Plants, and Culture Credits: 3
- EVPP 378 RS: Ecological Sustainability Credits: 4
- EVPP 480 Sustainability in Action Credits: 4
- CONS 490 RS: Integrated Conservation Strategies Credits: 3 **

** These courses are only open to students attending the Smithsonian-Mason Semester.

Chemistry (8 credits)

Mason Core: Natural Science courses:

- <u>CHEM 211 General Chemistry</u> Credits: 4
- CHEM 212 General Chemistry Credits: 4

Mathematics (7-8 credits)

- MATH 111 Linear Mathematical Modeling Credits: 3 (Mason Core: Quantitative Reasoning course)
- <u>MATH 113 Analytic Geometry and Calculus I</u> Credits: 4 (<u>Mason Core: Quantitative Reasoning</u> course)
- MATH 114 Analytic Geometry and Calculus II Credits: 4

Geology (4 credits)

• GEOL 102 - Introductory Geology II Credits: 4 (Mason Core: Natural Science course)

Information Technology (3 credits)

• CDS 130 - Computing for Scientists Credits: 3 (Mason Core: Information Technology course)

Concentrations (21 credits)

Students select a concentration in conservation, ecological science, environmental health, human and ecosystem response to climate change, or marine, estuarine, and freshwater ecology. Students take 21 credits of coursework as indicated below for the selected concentration.

▲ Concentration in Conservation (CNSV)

Students must take at least 21 credits from the list below. CONS courses (except <u>CONS 498</u> and <u>CONS 499</u>) are offered exclusively through the <u>Smithsonian-Mason Semester</u>.

- EVPP 318 Conservation Biology Credits: 3
- EVPP 378 RS: Ecological Sustainability Credits: 4
- EVPP 395 Undergraduate Research in Environmental Science and Policy Credits: 1-3 *

- EVPP 396 Directed Topic in Environmental Science and Policy Credits: 1-4 *
- EVPP 419 Marine Mammal Biology and Conservation Credits: 3
- EVPP 420 Marine Mammal Biology and Conservation Field Course Credits: 1
- EVPP 421 Marine Conservation Credits: 3
- EVPP 427 Disease Ecology and Conservation Credits: 3
- EVPP 440 Field Environmental Science Credits: 0-4 *
- EVPP 490 Special Topics in Environmental Science and Policy Credits: 0-4 *
- EVPP 494 Internship Credits: 1-3 *
- BIOL 310 Biodiversity Credits: 3
- BIOL 435 Selected Topics in Biology Credits: 0-4 *
- <u>CONS 320 Conservation in Practice</u> Credits: 3 **
- CONS 401 Conservation Theory Credits: 3 **
- <u>CONS 402 Applied Conservation</u> Credits: 4 **
- CONS 403 Ecology and Conservation Theory Credits: 3 **
- CONS 404 Monitoring and Assessment of Biodiversity Credits: 4 **
- CONS 410 Human Dimensions in Conservation Credits: 3 **
- CONS 411 Science Communication for Conservation Credits: 3 **
- CONS 420 Human-Wildlife Conflict Credits: 3 **
- <u>CONS 490 RS: Integrated Conservation Strategies</u> Credits: 3 ** (<u>Mason Core: Synthesis</u> course)
- CONS 491 RS: Comprehensive Conservation Planning Credits: 3 **
- CONS 497 Special Topics in Conservation Credits: 1-3 **
- <u>CONS 498 Internship</u> Credits: 1-3
- CONS 499 Independent Study/Research Credits: 1-3
- GGS 303 Conservation of Resources and Environment Credits: 3
- GGS 307 Sustainable Development Credits: 3
- NCLC 311 The Mysteries of Migration: Consequences for Conservation Credits: 6
- PRLS 300 People with Nature Credits: 3
- PRLS 402 Human Behavior in Natural Environments Credits: 3
- Additional courses approved by the program coordinator

* In a relevant topic

** Only offered through the Smithsonian-Mason Semester

Concentration Total: 21 credits

▲ Concentration in Ecological Science (ECSI)

Students must take 21 credits from the following:

- EVPP 309 Introduction to Oceanography Credits: 3
- EVPP 350 Freshwater Ecosystems Credits: 4
- EVPP 355 Ecological Engineering and Ecosystem Restoration Credits: 4
- EVPP 378 RS: Ecological Sustainability Credits: 4
- EVPP 395 Undergraduate Research in Environmental Science and Policy Credits: 1-3 *
- EVPP 396 Directed Topic in Environmental Science and Policy Credits: 1-4 *
- EVPP 408 Mushrooms, Molds and Society Credits: 3
- EVPP 427 Disease Ecology and Conservation Credits: 3

- EVPP 440 Field Environmental Science Credits: 0-4 *
- EVPP 449 Marine Ecology Credits: 3
- EVPP 490 Special Topics in Environmental Science and Policy Credits: 0-4 *
- EVPP 494 Internship Credits: 1-3 *
- <u>BIOL 310 Biodiversity</u> Credits: 3
- BIOL 345 Plant Ecology Credits: 4
- BIOL 435 Selected Topics in Biology Credits: 0-4 *
- BIOL 459 Fungi and Ecosystems Credits: 3
- GEOL 305 Environmental Geology Credits: 3
- GEOL 306 Soil Science Credits: 3
- GGS 307 Sustainable Development Credits: 3
- Additional courses approved by the program coordinator

* In a relevant topic

Concentration Total: 21 credits

▲ Concentration in Environmental Health (EVHL)

Required courses:

- EVPP 427 Disease Ecology and Conservation Credits: 3
- EVPP 445 Principles of Environmental Toxicology Credits: 3 And 15 credits from the following:
- EVPP 395 Undergraduate Research in Environmental Science and Policy Credits: 1-3 *
- EVPP 396 Directed Topic in Environmental Science and Policy Credits: 1-4 *
- EVPP 409 Medical Mycology Credits: 3
- EVPP 440 Field Environmental Science Credits: 0-4 *
- EVPP 490 Special Topics in Environmental Science and Policy Credits: 0-4 *
- EVPP 494 Internship Credits: 1-3 *
- EVPP 515 Molecular Environmental Biology I Credits: 3
- <u>BIOL 305 Biology of Microorganisms</u> Credits: 3 and <u>BIOL 306 Biology of Microorganisms Laboratory</u> <u>Credits: 1</u>
- BIOL 402 Applied and Industrial Microbiology Credits: 3
- BIOL 404 Medical Microbiology Credits: 3
- BIOL 465 Histology Credits: 4
- CHEM 505 Hazardous Materials Waste Management Credits: 1-3
- CEIE 555 Principles of Environmental Engineering Credits: 3
- GCH 205 Global Health Credits: 3 (Mason Core: Global Understanding course)
- GCH 360 Health and Environment Credits: 3
- <u>GCH 560 Environmental Health</u> Credits: 3
- GGS 302 Global Environmental Hazards Credits: 3
- GGS 304 Populations Dimensions of Global Change Credits: 3
- GGS 307 Sustainable Development Credits: 3
- GGS 319 Air Pollution Credits: 3
- <u>GGS 322 Issues in Global Change</u> Credits: 3
- Additional courses approved by the program coordinator

* In a relevant topic

Concentration Total: 21 credits

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

Required courses:

• EVPP 336 - Human Dimensions of the Environment Credits: 3

And 18 credits chosen from the following:

- <u>EVPP 309 Introduction to Oceanography</u> Credits: 3
- EVPP 355 Ecological Engineering and Ecosystem Restoration Credits: 4
- EVPP 378 RS: Ecological Sustainability Credits: 4
- EVPP 395 Undergraduate Research in Environmental Science and Policy Credits: 1-3 *
- EVPP 396 Directed Topic in Environmental Science and Policy Credits: 1-4 *
- EVPP 427 Disease Ecology and Conservation Credits: 3
- EVPP 432 Energy Policy Credits: 3
- EVPP 436 The Human Dimensions of Global Climate Change Credits: 3
- EVPP 440 Field Environmental Science Credits: 0-4 *
- EVPP 490 Special Topics in Environmental Science and Policy Credits: 0-4 *
- EVPP 494 Internship Credits: 1-3 *
- <u>CLIM 101 Global Warming: Weather, Climate, and Society</u> Credits: 3 (<u>Mason Core: Natural</u> <u>Science</u> course)
- <u>CLIM 111 Introduction to the Fundamentals of Atmospheric Science</u> Credits: 3 (<u>Mason Core: Natural</u> <u>Science</u> course)
- <u>CLIM 112</u> Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1 (Mason Core: Natural <u>Science</u> course)
- CLIM 312 Physical Climatology Credits: 3
- CLIM 314 Severe and Extreme Weather Credits: 3
- <u>CLIM 319 Air Pollution</u> Credits: 3
- CLIM 412 Physical Oceanography Credits: 3
- CLIM 438 Atmospheric Chemistry Credits: 3
- GEOL 309 Introduction to Oceanography Credits: 3
- <u>GGS 121 Dynamic Atmosphere and Hydrosphere</u> Credits: 4 (<u>Mason Core: Natural Science</u> course)
- GGS 302 Global Environmental Hazards Credits: 3
- <u>GGS 304 Populations Dimensions of Global Change</u> Credits: 3
- GGS 307 Sustainable Development Credits: 3
- <u>GGS 309 Meteorology and Climate</u> Credits: 3
- GGS 312 Physical Climatology Credits: 3
- GGS 314 Severe and Extreme Weather Credits: 3
- GGS 319 Air Pollution Credits: 3
- <u>GGS 321 Biogeography: Space, Time and Life</u> Credits: 3
- <u>GGS 322 Issues in Global Change</u> Credits: 3
- <u>GGS 353 Observations of the Earth and its Climate</u> Credits: 3
- GGS 354 Data Analysis and Global Change Detection Techniques Credits: 3
- GGS 456 Introduction to Atmospheric Radiation Credits: 3

- Additional courses approved by the program coordinator
 - * In a relevant topic

Concentration Total: 21 credits

▲ Concentration in Marine, Estuarine and Freshwater Ecology (MEFC)

Required courses:

- EVPP 309 Introduction to Oceanography Credits: 3
- EVPP 350 Freshwater Ecosystems Credits: 4
- EVPP 421 Marine Conservation Credits: 3
- EVPP 449 Marine Ecology Credits: 3 And at least 8 credits chosen from the following:
- EVPP 318 Conservation Biology Credits: 3
- EVPP 363 Coastal Morphology and Processes Credits: 4
- EVPP 380 Wetlands of the World Credits: 4
- EVPP 395 Undergraduate Research in Environmental Science and Policy Credits: 1-3 *
- EVPP 396 Directed Topic in Environmental Science and Policy Credits: 1-4 *
- EVPP 419 Marine Mammal Biology and Conservation Credits: 3
- EVPP 420 Marine Mammal Biology and Conservation Field Course Credits: 1
- EVPP 427 Disease Ecology and Conservation Credits: 3
- EVPP 440 Field Environmental Science Credits: 0-4 *
- EVPP 490 Special Topics in Environmental Science and Policy Credits: 0-4 *
- EVPP 494 Internship Credits: 1-3 *
- BIOL 331 Invertebrate Zoology Credits: 4
- BIOL 480 The Diversity of Fishes Credits: 3
- GEOL 364 Marine Geology Credits: 3
- GEOL 458 Chemical Oceanography Credits: 3
- <u>GGS 307 Sustainable Development</u> Credits: 3
- CLIM 412 Physical Oceanography Credits: 3
- <u>NCLC 318 Exploring Virginia's Watersheds</u> Credits: 4
- Additional courses approved by the program coordinator

* In a relevant topic

Concentration Total: 21 credits

Mason Core and Elective Credits (37-39 credits)

These 37-39 credits are available to fulfill any remaining <u>Mason Core</u> requirements (outlined below). Once those and all <u>requirements for bachelor's degrees</u> are met, any remaining credits may be completed by elective courses. Students are strongly encouraged to consult with their advisor to ensure that they fulfill all requirements.

Mason Core

Please note that some Mason Core requirements may already be fulfilled by the major requirements listed above.

Expand each item below for a link to specific course lists for each category:

Foundation Requirements (15-19 credits)

- <u>Mason Core UWCU Written Communication Credits: 6</u>
- <u>Mason Core UOC Oral Communication Credits: 3</u>
- <u>Mason Core UQR Quantitative Reasoning Credits: 3</u>
- <u>Mason Core UITC Information Technology Credits: 3-7</u>

Core Requirements (22 credits)

- Mason Core UFA Arts Credits: 3
- Mason Core UGU Global Understanding Credits: 3
- Mason Core ULIT Literature Credits: 3
- Mason Core UNSL Natural Science Credits: 7
- Mason Core USBS Social and Behavioral Sciences Credits: 3
- Mason Core UWC Western Civilization/Western History Credits: 3

Synthesis/Capstone Requirement (minimum 3 credits)

• <u>Mason Core USYN - Synthesis/Capstone Credits: minimum 3</u>

Degree Total: Minimum 120 credits