

# GEOLOGY, BA

**Banner Code:** SC-BA-GEOL

**Dr. Stacey Verardo, Undergraduate Coordinator and Term Professor**

Research Hall, Room 109  
Fairfax Campus

Phone: 703-993-1045

Email: sverardo@gmu.edu

Website: [cos.gmu.edu/aoes/academics/undergraduate-programs/](https://cos.gmu.edu/aoes/academics/undergraduate-programs/)

The Geology, BA program aims to provide students with both high-quality conceptual knowledge and hands-on training in geology in preparation for careers within the earth-science field or for graduate school in geology.

This is a Green Leaf program.

## Admissions & Policies

### Admissions

University-wide admissions policies can be found in the Undergraduate Admissions 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 including the Mason Core.

GEOL 317 Geomorphology fulfills the writing intensive requirement for this major.

For policies governing all undergraduate degrees, see AP.5 Undergraduate Policies.

## Requirements

### Degree Requirements

Total credits: minimum 120

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

Candidates for a degree in geology must complete all courses with a minimum GPA of 2.50.

### Geology Core

GEOL 101	Introductory Geology I (Mason Core)	4
GEOL 102	Introductory Geology II (Mason Core)	4
GEOL 302	Mineralogy	4
GEOL 304	Sedimentary Geology <sup>1</sup>	4
GEOL 308	Igneous and Metamorphic Petrology <sup>1</sup>	4
GEOL 312	Invertebrate Paleontology	4

GEOL 317	Geomorphology <sup>2</sup>	4
GEOL 401	Structural Geology	4
Six credits of		6
GEOL 404	Geological Field Techniques <sup>3</sup>	
Total Credits		38

<sup>1</sup> Students must achieve a grade of 'C' or better in GEOL 302 Mineralogy before taking GEOL 304 Sedimentary Geology or GEOL 308 Igneous and Metamorphic Petrology.

<sup>2</sup> Fulfills writing-intensive requirement.

<sup>3</sup> A 6-credit geology field camp may be substituted for this requirement; see advisor for details.

### Chemistry

CHEM 211	General Chemistry I (Mason Core)	3
CHEM 213	General Chemistry Laboratory I (Mason Core)	1
Total Credits		4

### Physics

Select one from the following:		4
PHYS 243 & PHYS 244	College Physics (Mason Core) and College Physics Lab (Mason Core)	
PHYS 160 & PHYS 161	University Physics I (Mason Core) and University Physics I Laboratory (Mason Core)	
Total Credits		4

### Mathematics

Select one from the following:		3-4
MATH 110	Introductory Probability (Mason Core)	
MATH 111	Linear Mathematical Modeling (Mason Core)	
MATH 113	Analytic Geometry and Calculus I (Mason Core)	
Total Credits		3-4

### Computer Science

GGS 311	Introduction to Geographic Information Systems	3
Total Credits		3

### Program Courses

Students must take 9 credits of degree-related coursework in a coherent program designed in coordination with advisor and approved by department chair	9
Total Credits	9

### Mason Core and Elective Credits

In order to meet a minimum of 120 credits, this degree requires an additional 58-59 credits, which may be applied toward any remaining Mason Core requirements (outlined below), Requirements for Bachelor's Degrees, College Requirements for the BA Degree (outlined below), and

elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

### Mason Core

Note: Some 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 requirements.

Code	Title	Credits
<b>Foundation Requirements</b>		
	Written Communication	6
	Oral Communication	3
	Quantitative Reasoning	3
	Information Technology	3-7
<b>Core Requirements</b>		
	Arts	3
	Global Understanding	3
	Literature	3
	Natural Science	7
	Social and Behavioral Sciences	3
	Western Civilization/World History	3
<b>Synthesis/Capstone Requirement <sup>1</sup></b>		
	Synthesis/Capstone	3
Total Credits		40

<sup>1</sup> minimum 3 credits

### College Requirements for the BA Degree

In addition to the program requirements and the Mason Core requirements, students pursuing a BA degree must complete the coursework below. Except where expressly prohibited, a course used to fulfill this college-level requirement may also be used simultaneously to satisfy other requirements such as Mason Core requirements, other college-level requirements, or requirements for the major. In some cases, the requirements listed below may be superseded by requirements of the degree program and the Mason Core.

#### Philosophy or Religious Studies

Code	Title	Credits
Select 3 credits from the following:		3
	PHIL <sup>1</sup>	
	RELI	

<sup>1</sup> PHIL 323 Classical Western Political Theory and PHIL 324 Modern Western Political Theory may not be used to fulfill this requirement.

#### Social and Behavioral Sciences

Choose one approved Mason Core: Social and Behavioral Sciences course in addition to the Mason Core-required course for a total of 6 credits. The two courses used to fulfill the combined college-level and university requirements must be from different disciplines.

This requirement may be fulfilled by completing any course in ANTH, CRIM, ECON, GOVT, HIST<sup>1</sup>, LING, PSYC, or SOCI, and the following GGS courses:

Code	Title	Credits
Select any course from the disciplines above or select from the following GGS courses:		3
GGS 101	Major World Regions (Mason Core)	
GGS 103	Human Geography (Mason Core)	
GGS 110	Introduction to Geoinformation Technologies	
GGS 301	Political Geography	
GGS 303	Geography of Resource Conservation (Mason Core)	
GGS 304	Population Geography (Mason Core)	
GGS 305	Economic Geography	
GGS 306	Urban Geography	
GGS 315	Geography of the United States	
GGS 316	Geography of Latin America	
GGS 320	Geography of Europe	
GGS 325	Geography of North Africa and the Middle East	
GGS 330	Geography of the Soviet Succession States	
GGS 357	Structures in Urban Governance and Planning	
GGS 380	Geography of Virginia	
Total Credits		3

<sup>1</sup> HIST 100 History of Western Civilization (Mason Core) and HIST 125 Introduction to World History (Mason Core) may not be used to fulfill this requirement.

#### Natural Science

Choose one credit in addition to the Mason Core: Natural Science requirement for a total of 8 credits. This combined college-level and university requirement must be fulfilled by completing two of any approved Mason Core: Natural Science courses that include a laboratory experience<sup>1</sup>.

Code	Title	Credits
Select an additional Mason Core Natural Science course		1
	BIOL 124 Human Anatomy and Physiology and BIOL 125 Human Anatomy and Physiology may not be used to fulfill this requirement.	

#### Foreign Language

Intermediate-level proficiency in one foreign language is required<sup>1</sup>. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher-level courses taught in the language).

Code	Title	Credits
Select a foreign language course numbered 202, 209, 210, or higher if a waiver isn't applicable		0-3

<sup>1</sup> Students may be eligible for a waiver of this requirement if they are already proficient in a second language or if they have received a satisfactory score on an approved proficiency test. Additional information on waivers can be found via the college's Office of Academic and Student Affairs (<https://cos.gmu.edu/uaa>).

**Non-Western Culture**

Choose one approved Non-Western Culture Requirement<sup>1</sup> course in addition to the course used to fulfill the Mason Core: Global Understanding requirement. A course used to fulfill the Mason Core: Global Understanding requirement may not be simultaneously used to satisfy this college-level requirement. However, a course used to fulfill this requirement may be used simultaneously to fulfill any *other* requirements (Mason Core requirements, college-level requirements, or requirements for the major).

Code	Title	Credits
Select 3 credits from approved Non-Western Culture courses if a waiver isn't applicable:		0-3
ANTH 114	Introduction to Cultural Anthropology (Mason Core)	3
ANTH 300	Civilizations	3
ANTH 301	Native North Americans	3
ANTH 302	Peoples and Cultures of Latin America (Mason Core)	3
ANTH 303	Peoples and Cultures of the Andes	3
ANTH 306	Peoples and Cultures of Island Asia (Mason Core)	3
ANTH 307	Ancient Mesoamerica (Mason Core)	3
ANTH 308	Peoples and Cultures of the Middle East (Mason Core)	3
ANTH 309	Peoples and Cultures of India (Mason Core)	3
ANTH 313	Myth, Magic, and Mind (Mason Core)	3
ANTH 314	Zombies	3
ANTH 316	Peoples and Cultures of the Caribbean (Mason Core)	3
ANTH 323	Digging and Dealing in the Dead: Ethics in Archaeology	3
ANTH 330	Peoples and Cultures of Selected Regions: Non-Western	3
ANTH 332	Cross-Cultural Perspectives on Globalization (Mason Core)	3
ANTH 381	Medical Anthropology	3
ANTH 383	Cities of the Global South	3
ANTH 396	Issues in Anthropology: Social Sciences (Mason Core)	3
ARAB 360	Topics in Arabic Cultural Production	3
ARAB 420	Survey of Arabic Literature	3
ARAB 440	Topics in Arabic Religious Thought and Texts (Mason Core)	3
ARTH 203	Survey of Asian Art (Mason Core)	3
ARTH 204	Survey of Latin American Art (Mason Core)	3
ARTH 206	Survey of African Art (Mason Core)	3
ARTH 318	Art and Archaeology of Ancient Egypt	3
ARTH 319	Art and Archaeology of the Ancient Near East (Mason Core)	3
ARTH 320	Art of the Islamic World (Mason Core)	3
ARTH 382	Arts of India (Mason Core)	3
ARTH 383	Arts of Southeast Asia (Mason Core)	3
ARTH 384	Arts of China (Mason Core)	3
ARTH 385	Arts of Japan (Mason Core)	3
ARTH 386	The Silk Road (Mason Core)	3
ARTH 482	RS: Advanced Studies in Asian Art	3
CHIN 318	Introduction to Classical Chinese (Mason Core)	3
CHIN 320	Contemporary Chinese Film	3
CHIN 325	Major Chinese Writers (Mason Core)	3
DANC 118	World Dance (Mason Core)	3
ECON 361	Economic Development of Latin America (Mason Core)	3
ECON 362	African Economic Development (Mason Core)	3
FREN 451	Topics in Sub-Saharan Francophone Literature and Culture	3
FREN 454	Topics in Caribbean Francophone Literature and Culture	3
GGG 101	Major World Regions (Mason Core)	3
GGG 316	Geography of Latin America	3
GGG 325	Geography of North Africa and the Middle East	3
GGG 330	Geography of the Soviet Succession States	3
GGG 399	Select Topics in GGS	3
GOVT 328	Non-Western Political Theory	3
GOVT 332	Government and Politics of the Middle East and North Africa	3
GOVT 333	Government and Politics of Asia	3
GOVT 340	Central Asian Politics	3
GOVT 341	Chinese Foreign Policy	3
GOVT 345	Islam and Politics	3
GOVT 432	Political Change and Social Development in Sub-Saharan Africa	3
GOVT 433	Political Economy of East Asia	3
HIST 251	Survey of East Asian History (Mason Core)	3
HIST 252	Survey of East Asian History (Mason Core)	3
HIST 261	Survey of African History (Mason Core)	3
HIST 262	Survey of African History (Mason Core)	3
HIST 271	Survey of Latin American History (Mason Core)	3
HIST 272	Survey of Latin American History (Mason Core)	3
HIST 281	Survey of Middle Eastern Civilization (Mason Core)	3
HIST 282	Survey of Middle Eastern Civilization (Mason Core)	3
HIST 326	Stalinism	3
HIST 327	The Soviet Union and Russia Since World War II	3
HIST 328	Rise of Russia (Mason Core)	3
HIST 329	Modern Russia and the Soviet Union (Mason Core)	3
HIST 353	History of Traditional China	3
HIST 354	Modern China	3

HIST 356	Modern Japan (Mason Core)	3
HIST 357	Postwar Japan (Mason Core)	3
HIST 358	Post-1949 China (Mason Core)	3
HIST 360	History of South Africa (Mason Core)	3
HIST 364	Revolution and Radical Politics in Latin America (Mason Core)	3
HIST 365	Conquest and Colonization in Latin America (Mason Core)	3
HIST 366	Comparative Slavery	3
HIST 367	History, Fiction, and Film in Latin America	3
HIST 387	Topics in Global History (Mason Core)	3-6
HIST 426	The Russian Revolution	3
HIST 460	Modern Iran (Mason Core)	3
HIST 461	Arab-Israeli Conflict	3
HIST 462	Women in Islamic Society (Mason Core)	3
HIST 465	The Middle East in the 20th Century	3
JAPA 310	Japanese Culture in a Global World (Mason Core)	3
JAPA 340	Topics in Japanese Literature (Mason Core)	3
KORE 320	Korean Popular Culture in a Global World	3
MUSI 103	Musics of the World (Mason Core)	3
RELI 211	Religions of the West (Mason Core)	3
RELI 212	Religions of Asia (Mason Core)	3
RELI 240	Death and the Afterlife in World Religions	3
RELI 272	Islam	3
RELI 313	Hinduism (Mason Core)	3
RELI 314	Chinese Philosophies and Religious Traditions	3
RELI 315	Buddhism (Mason Core)	3
RELI 337	Mysticism: East and West	3
RELI 365	Muhammad: Life and Legacy	3
RELI 374	Islamic Thought (Mason Core)	3
RELI 375	Qur'an and Hadith	3
RELI 379	Islamic Law, Society, and Ethics	3
RELI 387	Islam, Democracy, and Human Rights	3
RELI 490	Comparative Study of Religions (Mason Core)	3
RUSS 353	Russian Civilization (Mason Core)	3
RUSS 354	Contemporary Post-Soviet Life (Mason Core)	3

<sup>1</sup> Students who can document attendance at a native school in a non-western country for at least four years may request a waiver from this requirement through the CHSS Undergraduate Academic Affairs Office (<http://chssundergrad.gmu.edu>).

## Honors

### Honors in the Major

Earth science and geology majors who have completed 16 credits of math and science, including GEOL 302 Mineralogy with a GPA of 3.00 or higher are eligible to enter the departmental honors program. Transfer students who have an incoming GPA of 3.10 or higher in math and

science and a grade of 'B' or better in GEOL 302 Mineralogy are also eligible. To graduate with honors in Earth Science, students are required to maintain a minimum GPA of 3.00 in math and science courses and complete one of the two following sets of courses with an average GPA of 3.50 or better:

#### Course List

Code	Title	Credits
<b>First Set of Courses</b>		
GEOL 410	Research Proposal Preparation	1
GEOL 411	Geological Research	3
GEOL 420	Earth Science and Policy (Mason Core)	3
<b>Second Set of Courses</b>		
CLIM 408	Senior Research	3
CLIM 409	Research Internship	3
GEOL 420	Earth Science and Policy (Mason Core)	3

## Accelerated Master's

### Bachelor's Degree (Green Leaf)/ 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 in less time than if they had first graduated with an environmentally-focused Green Leaf-designated 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. For policies governing all graduate programs, see AP.6 Graduate Policies.

#### Admission Requirements

Students with an overall GPA of at least 3.20 who are pursuing any Green Leaf-designated 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) and CHEM 212 General Chemistry II (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:		
<b>Option 1:</b>		
BIOL 213	Cell Structure and Function (Mason Core)	
BIOL 214	Biostatistics for Biology Majors	
BIOL 308	Foundations of Ecology and Evolution	
<b>Option 2:</b>		
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 6 credits of BIOL or CONS electives

**Option 4:**

CONS 403 Ecology and Conservation Theory

CONS 404 Biodiversity Monitoring

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 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 who is willing to serve as their advisor (unless the student is planning to enroll in the MS concentration in Environmental Management). 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 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 (please note that a letter of endorsement from an advisor not necessary for candidates taking the Environmental Management concentration).

For information specific to the accelerated Environmental Science and 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 27-31 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.