GEOLOGY, BA

Banner Code: SC-BA-GEOL

Academic Advising

Email: geology@gmu.edu
Website: https://science.gmu.edu/academics/departments-units/atmospheric-oceanic-earth-sciences/geology-ba

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 studies in geology.

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

Admissions & Policies

Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies (https://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 (https://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2) including the Mason Core (https://catalog.gmu.edu/mason-core/).

GEOL 317 Geomorphology (Mason Core) (https://catalog.gmu.edu/mason-core/) fulfills the writing intensive requirement for this major.

For policies governing all undergraduate degrees, see AP.5 Undergraduate Policies (https://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.

Candidates for a degree in geology must complete all core courses with a minimum GPA of 2.30.

Geology Core

Code	Title	Credits
GEOL 101 & GEOL 103	Physical Geology (Mason Core) (https://catalog.gmu.edu/mason-core/) and Physical Geology Lab (Mason Core) (https://catalog.gmu.edu/mason-core/)	4
GEOL 102 & GEOL 104	Historical Geology (Mason Core) (https://catalog.gmu.edu/mason-core/) and Historical Geology Laboratory (Mason Core) (https://catalog.gmu.edu/mason-core/)	4
GEOL 302	Mineralogy	4
GEOL 304	Sedimentary Geology	4
GEOL 308	Igneous and Metamorphic Petrology	4
GEOL 312	Invertebrate Paleontology	4
GEOL 317	Geomorphology (Mason Core) (https://catalog.gmu.edu/mason-core/) [1]	4
GEOL 401	Structural Geology	4
Total Credits		**32**

[1] Fulfills writing-intensive requirement.

Geology Electives

Code	Title	Credits
Students must select a minimum of 15 credits in geology or geology-related coursework from the following:		15
Option One		
GEOL 404	Geological Field Techniques	
Select three courses from the Geology Electives list below		
Option Two		
Select five courses from the Geology Electives list below		
Geology Electives		
GEOL 301	Geological Field Experience	
GEOL 303	Field Mapping Techniques	
GEOL 305	Environmental Geology (Mason Core) (https://catalog.gmu.edu/mason-core/)	
GEOL 306	Soil Science	
GEOL 309	Oceanography	
GEOL 313	Hydrogeology	
GEOL 320	Resource Geology	
GEOL 325	Planetary Geology	
GEOL 332	Paleoclimatology	
GEOL 334	Vertebrate Paleontology (Mason Core) (https://catalog.gmu.edu/mason-core/)	
GEOL 340	Modern Methods in Geology	
GEOL 363	Coastal Morphology and Processes	
GEOL 364	Marine Geology	
GEOL 392	Geology and Earth Science Seminar	
GEOL 403	Geochemistry	
GEOL 404	Geological Field Techniques	
GEOL 412	Physical Oceanography	

GEOL 417	Geophysics	
GEOL 420	Earth Science and Policy (Mason Core) (https://catalog.gmu.edu/mason-core/)	
GEOL 441	Great Events in Earth History	
Total Credits		**15**

Chemistry

Code	Title	Credits
CHEM 211 & CHEM 213	General Chemistry I (Mason Core) (https://catalog.gmu.edu/mason-core/) and General Chemistry Laboratory I (Mason Core) (https://catalog.gmu.edu/mason-core/)	4
Total Credits		**4**

Physics

Code	Title	Credits
Select one from the following:		4
PHYS 160 & PHYS 161	University Physics I (Mason Core) (https://catalog.gmu.edu/mason-core/) and University Physics I Laboratory (Mason Core) (https://catalog.gmu.edu/mason-core/)	
PHYS 243 & PHYS 244	College Physics I (Mason Core) (https://catalog.gmu.edu/mason-core/) and College Physics I Lab (Mason Core) (https://catalog.gmu.edu/mason-core/)	
Total Credits		**4**

Mathematics

Code	Title	Credits
Select one from the following:		3-6
MATH 110	Introductory Probability (Mason Core) (https://catalog.gmu.edu/mason-core/)	
MATH 111	Linear Mathematical Modeling (Mason Core) (https://catalog.gmu.edu/mason-core/)	
MATH 113	Analytic Geometry and Calculus I (Mason Core) (https://catalog.gmu.edu/mason-core/)	
or MATH 123 & MATH 124	Calculus with Algebra/Trigonometry, Part A and Calculus with Algebra/Trigonometry, Part B (Mason Core) (https://catalog.gmu.edu/mason-core/)	
Total Credits		**3-6**

Computer Science

Code	Title	Credits
Select one course from the following:		3
CDS 130	Computing for Scientists (Mason Core) (https://catalog.gmu.edu/mason-core/)	
GGS 311	Geographic Information Systems	
Total Credits		**3**

Mason Core and Elective Credits

In order to meet a minimum of 120 credits, this degree requires an additional 56-59 credits, which may be applied toward any remaining Mason Core (https://catalog.gmu.edu/mason-core/) requirements (outlined below), Requirements for Bachelor's Degrees (https://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2), 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

Some Mason Core (https://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 (https://catalog.gmu.edu/mason-core/) requirements.

Students who have completed the following credentials are eligible for a waiver of the Foundation and Exploration (lower level) requirement categories. The Integration category (upper level) is not waived under this policy. See Admissions (https://catalog.gmu.edu/admissions/undergraduate-policies/#transfertext) for more information.

- VCCS Uniform Certificate of General Studies
- VCCS or Richard Bland Associate of Science (A.S.), Associate of Arts (A.A.), Associate of Arts and Sciences (A.A.&S.), or Associate of Fine Arts (A.F.A.)

Code	Title	Credits
Foundation Requirements		
Written Communication (lower-level) (https://catalog.gmu.edu/mason-core/#written)		3
Oral Communication (https://catalog.gmu.edu/mason-core/#oral)		3
Quantitative Reasoning (https://catalog.gmu.edu/mason-core/#quantitative)		3
Information Technology and Computing (https://catalog.gmu.edu/mason-core/#information-technology)		3
Exploration Requirements		
Arts (https://catalog.gmu.edu/mason-core/#arts)		3
Global Contexts (https://catalog.gmu.edu/mason-core/#global-contexts)		3
Global History (https://catalog.gmu.edu/mason-core/#global-history)		3
Literature (https://catalog.gmu.edu/mason-core/#literature)		3
Natural Science (https://catalog.gmu.edu/mason-core/#natural-science)		7
Social and Behavioral Sciences (https://catalog.gmu.edu/mason-core/#social-behavioral-science)		3
Just Societies (optional) (https://catalog.gmu.edu/mason-core/#justsocieties) [1]		
Integration Requirements		
Written Communication (upper-level) (https://catalog.gmu.edu/mason-core/#written)		3
Writing Intensive (https://catalog.gmu.edu/mason-core/#wi) [2]		3
Mason Apex (https://catalog.gmu.edu/mason-core/#apex) [3]		3
Total Credits		**40**

[1] In addition to covering content related to the designated category, Exploration level courses marked with a Just Societies "flag" are specifically designed to help students learn how to interact effectively with others from all walks of life, including those with backgrounds and beliefs that differ from their own. Students who wish to increase their knowledge and skills in this area may choose to enroll in a Just Societies-flagged course. Students interested in this approach to completing their Mason Core Exploration Requirements should work closely with their advisor to identify the appropriate Just Societies-flagged courses.

[2] 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.

[3] Minimum 3 credits required.

College Requirements for the BA Degree

In addition to the program requirements and the Mason Core (https://catalog.gmu.edu/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 (https://catalog.gmu.edu/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 (https://catalog.gmu.edu/mason-core/).

Foundational Breadth

Choose two courses from approved Mason Core: Arts (https://catalog.gmu.edu/mason-core/#arts), Mason Core: Literature (https://catalog.gmu.edu/mason-core/#literature), Mason Core: Global Contexts (https://catalog.gmu.edu/mason-core/#global-contexts), and Mason Core: Social and Behavioral Sciences (https://catalog.gmu.edu/mason-core/#social-behavioral-science) courses in addition to those required by the Mason Core (https://catalog.gmu.edu/mason-core/). The two courses used to fulfill the college-level requirements must each be from different Mason Core categories. Additionally, they must be from different disciplines than the courses used to fulfill the University Mason Core requirements.

Natural Science

Choose one credit in addition to the Mason Core: Natural Science (https://catalog.gmu.edu/mason-core/#natural-science) requirement for a total of 8 credits[1]. This combined college-level and university requirement must be fulfilled by completing two of any approved Mason Core: Natural Science (https://catalog.gmu.edu/mason-core/#natural-science) courses that include a laboratory experience[2].

Code	Title	Credits
Select an additional Mason Core Natural Science course		1

[1] For Geography, BA majors, this extra credit is not required.

[2] BIOL 124 Human Anatomy and Physiology I and BIOL 125 Human Anatomy and Physiology II may not be used to fulfill this requirement.

Foreign Language

Code	Title	Credits
Intermediate-level proficiency in one foreign language is required and may be fulfilled via one of the options below: [1]		
1. Completing a course in a foreign language numbered 202 (or its equivalent), or higher level courses taught in the language.		
2. Achieving a satisfactory score on an approved proficiency test.		
3. Completing a three course sequence in American Sign Language:		
EDSE 115	American Sign Language (ASL) I	
EDSE 116	American Sign Language (ASL) II	
EDSE 219	American Sign Language (ASL) III	
4. Conferral of a baccalaureate degree. [2]		

[1] Students who are already proficient in a second language may be eligible for a waiver of this requirement. Additional information on waivers can be found with the college's Office of Academic and Student Affairs (http://cosundergrad.gmu.edu/).

[2] This option is only available to students in the Biology, BA with a concentration in Biological Health who have already conferred a baccalaureate degree.

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.

Code	Title	Credits
First Set of Courses		
GEOL 410	Research Proposal Preparation	1
GEOL 411	Geological Research	3
GEOL 420	Earth Science and Policy (Mason Core) (https://catalog.gmu.edu/mason-core/)	3
Second Set of Courses		
CLIM 408	Senior Research (Mason Core) (https://catalog.gmu.edu/mason-core/)	3
CLIM 409	Research Internship	3
GEOL 420	Earth Science and Policy (Mason Core) (https://catalog.gmu.edu/mason-core/)	3

Accelerated Master's

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

Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their

education to obtain a Green Leaf-designated (https://catalog.gmu.edu/student-services/green-leaf-programs-courses/) bachelor's degree and the Environmental Science and Policy, MS (https://catalog.gmu.edu/colleges-schools/science/environmental-policy/environmental-science-policy-ms/) degrees within an accelerated timeframe. Upon completion of this 141-credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to 18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in five years.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7). For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/). For more information on undergraduates enrolling in graduate courses, see AP.1.4.4 Graduate Course Enrollment by Undergraduates (https://catalog.gmu.edu/policies/academic/registration-attendance/#text).

Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (https://catalog.gmu.edu/admissions/graduate-policies/) section of this catalog.

Important application information and processes for this accelerated master's program can be found here (https://www.gmu.edu/admissions-aid/accelerated-masters/).

The GRE exam is not required for this accelerated master's program.

Students should submit 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 (Perspective Advisor Form (https://science.gmu.edu/media/prospective-advisor-form-dnp-form-revised-mar-2023/)) 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.

Students with an overall GPA of at least 3.20 who are pursuing any Green Leaf-designated (https://catalog.gmu.edu/student-services/green-leaf-programs-courses/) major or minor may apply to this accelerated master's program after completing two semesters of chemistry (including CHEM 211 General Chemistry I (Mason Core) (https://catalog.gmu.edu/mason-core/) and CHEM 212 General Chemistry II (Mason Core) (https://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	
BIOL 214	Biostatistics for Biology Majors	
BIOL 308	Foundations of Ecology and Evolution (Mason Core) (https://catalog.gmu.edu/mason-core/)	
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		

Graduate Advisor

By at least the beginning of their senior year, students should seek out a faculty member in the Department of Environmental Science and Policy (https://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 University (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.

Accelerated Option Requirements

After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor's/accelerated master's transition form (available from the Office of the University Registrar (https://registrar.gmu.edu/forms/)) to the College of Science's Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us/) by the last day to add classes of their final undergraduate semester. Students should enroll for courses in the master's program in the fall or spring semester immediately following conferral of the bachelor's degree, but should contact an advisor if they would like to defer up to one semester.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

Reserve Graduate Credits

Accelerated master's students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate degree, but will reduce the master's degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate and graduate degrees plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

Graduate Course Suggestions

The following list of suggested courses is provided for general reference. To ensure an efficient route to graduation and post-graduation readiness, students are strongly encouraged to meet with an advisor before registering for graduate-level courses.

Code	Title	Credits
EVPP 518	Conservation Biology	3
EVPP 529	Environmental Science Communication	3
EVPP 621	Overview of Biodiversity Conservation	3
EVPP 635	Environment and Society	3

Geology, BA or BS/ Secondary Education, Accelerated MEd (Secondary Education - Science Concentration)

Overview

Highly-qualified undergraduates may be admitted to the bachelor's/accelerated master's program and obtain a BA or BS in Geology (https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/geology-bs/) and an MEd in Secondary Education (Secondary Education - Science concentration) (https://catalog.gmu.edu/colleges-schools/education-human-development/school-education/secondary-education-med/)in an accelerated time-frame after satisfactory completion of a minimum of 143 credits.

See AP.6.7 Bachelor's/Accelerated Master's Degree (https://catalog.gmu.edu/colleges-schools/education-human-development/school-education/) for policies related to this program.

This accelerated option is offered jointly by the Department of Atmospheric, Oceanic, and Earth Sciences (https://catalog.gmu.edu/colleges-schools/science/atmospheric-oceanic-earth-sciences/) and the School of Education (https://catalog.gmu.edu/colleges-schools/education-human-development/school-education/).

Students in an accelerated degree program must fulfill all university requirements for the master's degree. For policies governing all graduate degrees, see AP.6 Graduate Policies (https://catalog.gmu.edu/policies/academic/graduate-policies/#text).

BAM Pathway Admission Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in Graduate Admissions Policies (https://catalog.gmu.edu/admissions/graduate-policies/) and Bachelor's/Accelerated Master's Degree (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7) policies. For information specific to this accelerated master's program, see Application Requirements and Deadlines (https://cehd.gmu.edu/bachelors-accelerated-masters-program/).

Students will be considered for admission into the BAM Pathway after completion of a minimum of 60 credits, and additional unit-specific criteria.

Students who are accepted into the BAM Pathway will be allowed to register for graduate level courses after successful completion of a minimum of 75 undergraduate credits and course-specific pre-requisites.

Accelerated Master's Admission Requirements

Students already admitted in the BAM Pathway will be admitted to the MEd program, if they have met the following criteria, as verified on the Bachelor's/Accelerated Master's Transition form:

- 3.0 overall GPA
- Completion of specific undergraduate coursework
- Successfully meeting Mason's requirements for undergraduate degree conferral (graduation) and completing the application for graduation.

Accelerated Pathway Requirements

To maintain the integrity and quality of both the undergraduate and graduate degree programs, undergraduate students interested in taking graduate courses must choose from the following which can be taken as Advanced Standing or Reserve Graduate credit (https://catalog.gmu.edu/policies/academic/graduate-policies/#text) (to be determined by the student and their advisor):

Code	Title	Credits
EDRD 619	Literacy Across the Disciplines	3
EDUC 545	Teaching Science and Engineering Practices	3
SEED 522	Foundations of Secondary Education	3
SEED 540	Human Development and Learning: Secondary Education	3
SEED 573	Teaching Science in the Secondary School	3
SEED 673	Advanced Methods of Teaching Science in the Secondary School	3
One of the following:		
SEED 507	Assessing Learning and Teaching in the Secondary Classroom	
SEED 508	Creating Advocacy with Adolescent Learners	
SEED 509	Perspectives on Extraordinary Teaching	
SEED 510	Secondary Education in International Contexts	

For more detailed information on coursework and timeline requirements, see AP.6.7 Bachelor's/Accelerated Master's Degree (https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7) policies.