

GEOLOGY, BA

Banner Code: SC-BA-GEOL

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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 ¹ | 4 |
| GEOL 308 | Igneous and Metamorphic Petrology ¹ | 4 |
| GEOL 312 | Invertebrate Paleontology | 4 |

| | | |
|----------------|--|----|
| GEOL 317 | Geomorphology ² | 4 |
| GEOL 401 | Structural Geology | 4 |
| Six credits of | | 6 |
| GEOL 404 | Geological Field Techniques ³ | |
| Total Credits | | 38 |

¹ 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.

² Fulfills writing-intensive requirement.

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

¹ 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 ¹ | |
| | RELI | |

¹ 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, HIST¹, 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 |

¹ 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 experience¹.

| 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 required¹. 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 |

¹ 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 Requirement¹ 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 |

¹ 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 |
|------------------------------|---------------------------------------|---------|
| First Set of Courses | | |
| GEOL 410 | Research Proposal Preparation | 1 |
| GEOL 411 | Geological Research | 3 |
| GEOL 420 | Earth Science and Policy (Mason Core) | 3 |
| Second Set of Courses | | |
| 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: 13 | | |
| Option 1: | | |
| BIOL 213 | Cell Structure and Function (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 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.