

Program Change Request

Date Submitted: 01/20/26 2:03 pm

Viewing: **SC-PHD-GESC : Geology and Earth Science, PhD**

Last approved: 01/24/25 2:26 pm

Last edit: 01/30/26 4:11 pm

Changes proposed by: jbazaz

Catalog Pages
Using this Program
[Geology and Earth Science, PhD](#)

No Longer
Anticipated closure
Rationale for

Are you completing this form on someone else's behalf?
☐ Yes

Requestor:

- In Workflow
- 1. **AOES -Curriculum Committee**
 - 2. **AOES Chair**
 - 3. **SC Curriculum Committee**
 - 4. SC Assistant Dean
 - 5. Assoc Provost- Graduate
 - 6. Registrar-Programs

- Approval Path
- 1. 02/10/26 12:24 pm
Barry Klinger (bklinger):
Approved for AOES - Curriculum Committee
 - 2. 02/10/26 12:57 pm
Mark Uhen (muhen): Approved for AOES Chair

- History
- 1. Jan 23, 2025 by Jennifer Bazaz Gettys (jbazaz)
 - 2. Jan 24, 2025 by Deborah Mcgarrah (dmcgarra)

| Name | Extension | Email |
|-------------------|-----------|----------------|
| Geoff Gilleaudeau | 5302 | jbazaz@gmu.edu |

Effective Catalog: 2026-2027

Program Level:

Graduate

Program Type:

Doctoral

Degree Type:

Doctor of Philosophy

Title:

Geology and Earth Science, PhD

1. What was the process used withi
2. What evidence was used to iden
3. Have you ensured there are no c
4. Has CDE confirmed the proposed
5. Has the instructor(s) for this bad
6. Does this badge provide a benefit
5. Is this badge co-sponsored with a
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Banner Title:

PhD Geology & Earth Sciences

Is this a retitling of Existing Program

Registrar/OAPI Use Only – SCHEV Status

Approved

Registrar’s Office Use Only – Program Start Term

Fall 2025

Registrar/OAPI Use Only – SCHEV Letter

[SCHEV_PhD Geology and Earth Science Approved Fall 2025.pdf](#)

Registrar/OAPI Use Only – SACSCOC Status

Concentration(s):

**Registrar/IRR Use
Only –
Concentration CIP
Code**

College/School: College of Science

**Department /
Academic Unit:** Atmospheric, Oceanic, & Earth Sciences

**Jointly Owned
Program?** No

**Is there an
embedded degree
as part of a
program?**

~~Justification~~
~~Justification~~

Justification

What and Why:

1. Eliminate STAT 634 and replace it with "EVPP 585 or EVPP 651 or CLIM 762"

The hard-coded prerequisites for STAT 634 are a big hurdle for students in this program to have to jump.

2. Reduce the minimum number of credits of GEOL 998 to 9 and increase the minimum number of credits of GEOL 999 to 6.

The number of credits currently required for GEOL 998 (Doctoral Dissertation Proposal, 12 required) is inconveniently high, whereas only 3 credits are required for GEOL 999 (Doctoral Dissertation).

3. Update the electives list of the Geology PhD to remove GEOL 521- a replacement course is forthcoming.

**Total Credits
Required:** Total credits: 72

Registrar's Office Use Only - Program Code:

SC-PHD-GESC

**Registrar/IRR Use
Only – Program CIP
Code** 40.0601 - Geology/Earth Science, General.

**Admission
Requirements:**

Admissions

University-wide admissions policies can be found in the [Graduate Admissions Policies](#) section of this catalog.

Applicants should have an undergraduate or graduate degree in geology, Earth sciences, or a related field from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent with a GPA of at least 3.00 in their undergraduate work.

To apply for this program, please complete the [George Mason University Admissions Application](#) and supply three letters of recommendation.

Program-Specific Policies:

Policies

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

Transferring Previous Graduate Credit into this Program

Previously earned and relevant graduate credits may be eligible for transfer into this program; details can be found in the [Credit by Exam or Transfer](#) section of this catalog.

Degree Requirements:

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

Core Courses

| | | |
|---|--|--------------|
| Geology and Earth Science Foundation | | |
| GEOL 525 | Modeling Earth Signals and Systems | 3 |
| GEOL 540 | Modern Methods in Geology | 3 |
| GEOL 541 | Great Events in Earth History | 3 |
| GEOL 601 | The Lithosphere | 3 |
| GEOL 752 | Earth Sciences in Academia | 2 |
| Geology and Earth Science Seminars | | |
| Select a total of four credits in any combination of the following seminar courses: | | 4 |
| GEOL 536 | Paleontology Seminar | |
| GEOL 792 | Seminar in Earth Systems Science, Geology, Earth Science | |
| Research Methods | | |
| GEOL 720 | Bayesian Methods in Geology and Earth Sciences | 3 |
| GEOL 996 | Doctoral Reading and Research (repeat for a total of 15 credits) | 15 |
| STAT 634 | Case Studies in Data Analysis | 3 |
| CLIM 762 | Statistical Methods in Climate Research | <u>3</u> |

[or EVPP 585](#)[Quantitative Data Analysis for Environmental Scientists](#)[or EVPP 651](#)[Multivariate Data Analysis for Ecology and Environmental Science](#)

Total Credits

39

Restricted Elective Courses

Select 18 credits from the following, approved in advance by the Graduate Coordinator: ¹

18

[GEOL 500](#)

Selected Topics in Modern Geology

[GEOL 501](#)

Selected Topics in Modern Geology

[GEOL 504](#)

Sedimentary Geology

[GEOL 506](#)

Soil Science

[GEOL 510](#)

Advanced Structural Geology

[GEOL 512](#)

Invertebrate Paleontology

[GEOL 513](#)

Hydrogeology

~~[GEOL 521](#)~~~~[Geology of Energy Resources](#)~~[GEOL 520](#)[Resource Geology](#)[GEOL 532](#)

Paleoclimatology

[GEOL 534](#)

Vertebrate Paleontology

[GEOL 535](#)

Advanced Stratigraphy

[GEOL 553](#)

Field Mapping Techniques

[GEOL 563](#)

Coastal Morphology and Processes

[GEOL 565](#)

Paleoceanography

[GEOL 603](#)

Geochemistry

[GEOL 734](#)

Paleobiology

[GEOL 741](#)

Isotopes in Geology

Total Credits

18

¹

Select courses that have not previously been completed at the undergraduate course level.

Dissertation Committee

Requirements for the dissertation committee's composition can be found in the [AP.6.10.5](#) section of this catalog.

Students may select a fourth member with approval of the PhD Program Director. This option typically would be employed in order to include an external expert relevant to the student’s field of study.

Comprehensive Exam

The comprehensive exam includes written and oral components to assess whether students have the subject matter knowledge and skills to successfully propose and complete a dissertation research project and an oral component. Students must complete the comprehensive exam within two semesters after the completion of all core and concentration coursework on their approved program of study. The comprehensive exam will consist of a set of questions tailored to the individual student. The committee will be comprised of the same individuals as the Dissertation Committee. Exams will be graded on a pass/fail basis. Students must successfully pass both the written and oral portions of the comprehensive exam in order to advance to candidacy. Students who fail either the written or the oral portion of the comprehensive exam will be granted one attempt to retake the examination the following semester. Students who do not pass the second attempt will be dismissed from the PhD program.

Written Comprehensive Exam

The written portion of the comprehensive exam will assess the student’s ability to apply theoretical concepts towards the designing of potential research studies necessary to write a doctoral dissertation. It will also assess the student’s capability to form research questions and present appropriate methodologies to test such questions (including, for example: Study design, analytical model development, data acquisition or collection, data management, and analysis and interpretation). The questions on the exam will be linked with the student's program of study and proposed research subject matter.

Oral Comprehensive Exam

The oral portion of the comprehensive exam will assess the student’s knowledge and comprehension of the subject matter background to the field of geology and Earth sciences as a whole, as well as the specific body of knowledge related to the student’s chosen area of specialty and research. The student must demonstrate mastery in articulating answers including the limitations around data to prepare them for effectively working with various audiences.

Dissertation

| | | |
|--|---|-----------|
| <u>Complete 15 dissertation credits:</u> | | <u>15</u> |
| <u>GEOL 998</u> | Doctoral Dissertation Proposal (repeated for a maximum of 12 credits) | |
| <u>GEOL 999</u> | Doctoral Dissertation | |
| Total Credits | | 15 |

Advancement to Candidacy

Advancement to candidacy is based upon the student’s successful completion of all required coursework and passing the comprehensive examination. Advancement to candidacy is a prerequisite for admission into GEOL 998 Doctoral Dissertation Proposal.

Dissertation Proposal

Students who have advanced to candidacy begin working on the dissertation proposal the semester after passing their comprehensive exams by registering for [GEOL 998](#) Doctoral Dissertation Proposal. Students design the conceptual framework for their research projects in consultation with the dissertation committee. A draft dissertation proposal should be submitted to the student's dissertation committee within two semesters of completing the comprehensive exam. The proposal should include a detailed literature review that provides the context and rationale for the research questions and describes the proposed study design and analytic methods. The proposal must address the feasibility of completing the dissertation research within an appropriate time. A list of dissertation committee members must be included in the proposal, confirming each committee members' agreement to serve on the committee.

An oral proposal defense will be scheduled with all dissertation committee members in attendance. During the oral proposal defense, students describe their proposed research and address questions by the committee members. At the conclusion of the oral defense, the dissertation committee either approves the dissertation or provides written recommendations for improving the proposed research with clearly stated expectations for resubmission. All proposal defenses are open to faculty and students in the College of Science. Candidates attending the oral defense may be allowed to ask questions. The dissertation committee holds an executive session after the formal defense to finalize a decision for the student. Passing the proposal defense is a prerequisite for [GEOL 999](#) Doctoral Dissertation. Failure to submit the proposal in a timely manner is grounds for academic probation.

Dissertation Defense

The dissertation defense is an oral presentation of the dissertation work in a public forum open to all members of the university community. An abstract and draft dissertation approved by the dissertation committee in conformance with University Library requirements is required before the defense can be scheduled. The student consults with the dissertation committee to identify a date and time for the dissertation defense. Once a date and time has been confirmed, the student works with the appropriate area administrative assistant to reserve a room for the defense. All dissertation committee members should be present. The dissertation committee convenes after the public session to discuss and approve the dissertation. The student is notified after the committee's executive session. The student is responsible for making all required edits before final acceptance of the dissertation adhering to the university's timeline for graduation.

**Retroactive
Requirements
Updates:**

Plan of Study:

**Honors
Information:**

Accelerated
Description/Dual
Degree
Description:
INTO-Mason
Requirements:

College
Requirements &
Policies:

Department /
Academic Unit
Requirements &
Policies:

Program Outcomes Learning Outcomes

1. Demonstrate a breadth of knowledge of geology and earth sciences across the subfields of geology and earth sciences, along with a depth knowledge in their area(s) of specialization.
2. Exhibit expertise in research methodologies, analytical techniques, and interpretation of findings applicable to a variety of geologic research questions.
3. Effectively conduct critical reviews of relevant scientific literature.
4. Incorporate appropriate ethical standards in all research activities.
5. Produce original, reproducible research that contributes to the knowledge base of geology and earth sciences.
6. Expertly communicate research results to both scientific peers and general audiences.
7. Master the skills to conduct a research program including running a research laboratory and writing effective grant proposals.
8. Design instructional strategies in geology and Earth sciences that facilitate student learning in higher education.

Additional Program Information

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

Courses offered via
distance (if
applicable):

Indicate whether

What is the
primary delivery

Face-to-Face Only

format for the
program?

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

Is the content of the new program

Which existing approved

Is this new program considered to

Which existing approved

Is this new program considered to

Which existing approved

Is this a re-opening of a program

Date of Program Closure

What are the methods of delivery

Does this program include a

Is this change a simple retitling of an existing program, with no other changes, to any existing program content, curriculum requirements, etc?

No

Does this change represent a repackaging of content in an existing approved degree/certificate program at the same instructional level (i.e., baccalaureate, master's, or doctoral)?

No

Which existing approved

Percentage of total credits containing new course content. ("New course content" is defined by SACSCOC as content that is not currently included in an existing approved degree/certificate program at the same instructional level. Do not exclude gen ed credits in calculations for undergraduate programs.)

0%-24% ~~25%-49%~~

Does this change include the addition of a distance education or face-to-face method of delivery for this program?

No*What is the new method of***Does this change include the addition of a course/credit-based competency-based education delivery option?**No**Will any additional equipment/facilities be needed?**

No

*Description of institutional impact:***Will any additional faculty be required?**

No

*Description of institutional impact:***Will any additional financial resources be needed?**

No

*Description of institutional impact:***Additional library/learning resources needed?**

No

Description of institutional impact:

Have you reached out to the Libraries to determine whether there are adequate resources to support your program? If not, please email Meg Meiman, Associate University Librarian for Learning, Research, and Engagement at mmeiman2@gmu.edu.

No

OAPI Use Only – Determination of SACSCOC Impact

Comments or Notes

Green Leaf Program Designation

Is this a Green Leaf program? No

*Green Leaf**Sustainability-focused academic program:**Relationship to*

List sustainability-

Sustainability related academic pr

List sustainability-

Does this program cover material which crosses into another department?

No

Impacted

Additional

Attachments

SCHEV Proposal

[PhD Geology Earth Sciences 03022022.pdf](#)

Executive SummaryCurrently, Virginia offers only one PhD degree program in Geology, Earth Sciences and Geoscience. Virginia will need additional doctoral-level geoscientists in the future to train other geoscientists, to lead at government agencies, and to staff museums and other informal educational positions. The proposed degree program is intended to respond to the growing demand for experts with knowledge in critical minerals exploration, ice sheet dynamics and sea level change, renewable energy resources and technologies, and the evolution of Earth surface systems on a warming planet. The proposed program addresses the need for trained professionals in the Earth sciences. The proposed program emphasizes a research-oriented, global systems approach to studying the Earth and its systems: the atmosphere, the hydrosphere, and the lithosphere, including their interrelationships with the biosphere. Emphasis is on the observation, measurement, and analysis of Earth's systems. The need for Earth scientists in Virginia is expected to increase due to needs for mineral resources (particularly for electronics), energy resources, and due to increased threats of coastal erosion and erosion due to changes in precipitation patterns due to climate change. George Mason University can help meet these needs with this proposed doctoral program.

Reviewer

Comments

Additional

Comments

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

%wi_required.eshtml%

Attached

Key: 965