

Geology 101-002
Physical Geology
Spring 2026 Syllabus

Class Meeting Times and Location

Mondays and Wednesdays 1:30 – 2:45 pm
Buchanan Hall D023 (in person)

Instructor

Dr. Jules Goldspiel
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Office: Exploratory Hall 3414
Office Hours: Mondays 3:00 – 5:00 pm
Other days and times by appointment
Email: jgoldspi@gmu.edu (best contact method)

Course Description

3 Credits

This is a Natural Science Overview (non-lab) course. It is included in the Mason Core curriculum and fulfills requirements for the Natural Science category of the Exploration Courses section. The goals of this and other natural science core courses are to engage you in scientific exploration, foster your curiosity, enhance your enthusiasm for science, and enable you to apply scientific knowledge and reasoning to personal, professional and public decision making.

The course will focus on the structure of Earth, properties of Earth materials, processes that operate on and below the surface of Earth, and human interactions with Earth. Topics covered will include rocks and minerals, earthquakes and seismology, volcanic processes, marine processes, weathering and erosion, sediment transport and deposition, paleomagnetism, plate tectonics, and how the actions of gravity, wind, rivers, glaciers and groundwater shape the surface of Earth.

This course coordinates with GEOL 103, which is a separate 1-credit course that fulfills the Mason Core Natural Science Laboratory course requirement. Enrollment in GEOL 101 does not automatically enroll you in GEOL 103.

Course Textbooks

Primary Textbook (Recommended)

Essentials of Geology, 13th Edition, 2018, F. K. Lutgens, E. J. Tarbuck and D. Tasa, Pearson.

Available in print and electronic formats. Check with GMU Bookstore for purchasing and renting options.

Ancillary materials are also available from the publisher. These extra materials are not required.

Book is also on reserve at the Information Desk of Fenwick Library (Call Number QE26.3.L87 2018).

Alternate Textbook (Recommended)

An Introduction to Geology, 2017, C. Johnson, M. D. Affolter, P. Inkenbrandt, and C. Mosher.

Available online at no cost (<https://opengeology.org/textbook/>).

Expected Learning Outcomes

Upon successful completion of this course, students will be able to:

- Appreciate the range of physical and chemical processes that are (and have been) active on Earth, and understand how these processes work on geologic materials to enable geologic processes
- Understand how geologic processes work and leave their marks, large and small, on Earth
- Understand how the interior structure of the Earth can be determined
- Understand that Earth's continents are not fixed in place and have moved over Earth's history

- Appreciate the age of the Earth and understand how geologic ages are determined
- Appreciate that some geologic properties and processes are unique to Earth and some are shared with other planets
- Understand that scientific inquiry is based on collection of evidence, and the testing and analysis of theories against the collected evidence
- Understand that scientific knowledge and theories evolve based on collection of new evidence and new understandings of old evidence, and that scientific inquiry differs from personal and cultural beliefs
- Recognize and articulate the relationship between the natural sciences and society, and how science can be applied to societal challenges
- Evaluate scientific information and learn to distinguish primary and secondary sources, and to assess the credibility and validity of the information
- Recognize the scope and limits of science

Coursework and Grading Weights

The required coursework consists of weekly online quizzes and three exams. The weights of the graded items are as listed in the table at right. The weight shown for the quizzes is the weight for the combined score of all quizzes taken during the semester. Weights shown for the exams are the weights for each exam.

Quizzes will be released online on most weeks that class meets (refer to the Tentative Course Schedule). Each quiz will cover the most recent topics discussed since the last quiz. All quizzes will be time-limited and scored for accuracy.

Exams will not be cumulative; they will only cover the material discussed in the preceding third of the class (refer to the Tentative Course Schedule). The exams will be time-limited and scored for accuracy.

In addition to the required coursework, extra credit points may be earned by completing in-class exercises during most classes. There is no other opportunity for extra credit. Any exercise points earned will be credited to the corresponding exam, subject to limits detailed in the Course Policies section below.

Grading Schema

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Weighted Score (%)	≥ 99%	92.0 – 98.9%	90.0 – 91.9%	88.0 – 89.9%	82.0 – 87.9%	80.0 – 81.9%	78.0 – 79.9%	67.0 – 77.9%	65.0 – 66.9%	50.0 – 64.9%	< 50%

Course grades will be determined by the weighted percentage of total points possible (refer to Coursework and Grading Weights information above). The standard grading schema for this class is as indicated in the table above.

The final grading schema may be revised from the above standard schema based on general class performance or other factors. However, if any changes are made, the changes will be in a manner that is favorable to student grades (i.e., if the schema is changed, the change will set the cutoff for a grade to a lower weighted score percentage not higher).

Key Dates for Class Enrollment

Jan 27 Last day to add classes
 Feb 03 1st drop deadline (full tuition refund, no record on transcript)
 Feb 10 2nd drop deadline (50% tuition refund, no record on transcript)
 Feb 24 Last day for unrestricted Self-Withdrawal (no tuition refund, W on transcript)
 Mar 30 Last day for Selective Withdrawal (no tuition refund, W on transcript)

Tentative Course Schedule

Class	Date	Topic / Exam	Primary Textbook Chapter	Alternate Textbook Chapter
1	01/21	Course Information & Overview of Physical Geology	1	1
2	01/26	Matter and Minerals	3	3
3 *	01/28	Magma and Igneous Rocks	4	4
4	02/02	Volcanoes and Volcanic Hazards	5	4
5 *	02/04	Weathering and Soils	6	5
6	02/09	Sedimentary Rocks	7	5
7 *	02/11	Metamorphic Rocks	8	6
8	02/16	Review 1		
Exam	02/18	Exam I (1:30 – 2:45 pm)		
9	02/23	Mass Movement (Mass Wasting)	12	10
10 *	02/25	Surface Water	13	11
11	03/02	Groundwater	14	11
12 *	03/04	Glaciers	15	14
--	03/09	Spring Break (No Class)		
--	03/11	Spring Break (No Class)		
13	03/16	Glaciers & Ice Ages		
14 *	03/18	Wind & Dry Lands	16	13
15	03/23	Ocean Waves and Shore Evolution	17	12
16 *	03/25	Review 2		
Exam	03/30	Exam II (1:30 – 2:45 pm)		
17	04/01	Earth Structure and Plate Tectonics	2	2
18	04/06	Earthquakes and Seismic Waves	9	9
19 *	04/08	Origin and Evolution of Ocean Floors	10	
20	04/13	Crustal Deformation	11	9
21 *	04/15	Mountain Building & Geologic Time	18	7
22	04/20	Evolution of Earth	19	8
23 *	04/22	Earth Resources		16
24	04/27	Climate Change	20	15
25 *	04/29	Planetary Geology		
26	05/04	Review 3		
Exam	05/06	Exam III (Final Exam) (1:30 – 2:45 pm)		

* Online quiz released

Note: Course content and schedule may be modified as the semester progresses.

Course Policies

Attendance: Attendance is not strictly required, but students are expected to attend class regularly.

Conduct During Class: Students are responsible for their actions during class and exam times, and should always maintain an awareness of those around them. Everyone is expected to avoid engaging in disruptive or disrespectful behavior (including loud talking) that could interfere with other students' ability to hear or concentrate on the class discussions.

Electronic Devices: The use of electronic devices (computer, tablet, phone and the like) is permitted during class with some restrictions. The use of such devices is subject to the AI Tools policies for this course. Furthermore, their use may not be distractible or disruptive to the class, and all use of electronic devices must be respectful of your peers and instructor while class is being conducted.

For example, while in class, audible alerts on your devices must be off. You also may not use your electronic devices to engage in activities that are unrelated to the class while class is in session. The instructor reserves the right to prohibit the use of electronic devices by any student whose use of a device is unrelated and/or disruptive to the class.

Earbuds and headphones may not be worn at any time during class or during exams without an approved accommodation or prior approval from the instructor.

You may not use any device to access notes or any other information during exams. If an online exam option is made available, only a single electronic device may be used to take the online exam, and it may only be used to take the online exam. No other use of electronic devices is allowed during exams.

Please also refer to the GMU polices website for a summary of the university computer policies (<https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>). All university policies apply to any use of George Mason University computers and computer systems for this course.

Course Materials: All course materials provided or presented by the instructor (e.g., lecture outlines, lecture slides, exams, quizzes, exercises, demonstrations) are for course use only. ***These materials may not be shared, posted or in any way redistributed outside of the course, either electronically or as hardcopy.*** Sharing or redistribution of course materials in any form is a violation of the GMU Academic Standards Code.

Recording of Lectures: Lectures and demonstrations may *not* be electronically recorded in any format without prior permission of the instructor and completion of a recording agreement form. Acceptable agreement forms are the GMU Disability Services "Recording (Audio/Video) and Copies of Class Presentations Acknowledgement" form, or a similar form provided by the instructor. In all cases, the opinions, questions and comments of other class members may not be shared at any point with anyone else.

Quizzes: Quizzes will be taken online through the course Canvas website. Quizzes will be made available on Canvas approximately weekly and are to be completed outside of class. Unless otherwise noted, you will have one week to complete each quiz once it is made available online.

Quizzes are time-limited with a flexible start time. You may start the quizzes at any time during the window that each quiz is available. Once started, all quizzes must be completed within 60 minutes.

Quizzes are open book and open notes. You may use notes, books or any other information for the quizzes.

Exams: There will be three Exams given over the semester. Exams I and II will be taken during the regular class time on the dates listed in the course schedule. These exams will start at the regular class start time, and end at the regular class end time. Exam III (the Final Exam) will be taken during Final Exam week on the date listed on the course schedule, with the specific start and end times that are also listed on the course schedule.

Exam I must be taken in class using a paper exam. For Exams II and III you *may* have the option of taking exams remotely online. An online option for Exams II and III is not guaranteed. Information on whether or not an online exam option is available will be provided at least one week before the exam date.

All in-class paper exams will require you to mark your answers on a Scantron form. A suitable Scantron form will be provided for your use for each exam taken in class on paper.

If an online exam option is made available, it will require use of the Honorlock system. Information on Honorlock will be provided in class at least one week before the exam date if the online option is available.

Exams are time-limited with a fixed start time. Exam start times are listed in the course schedule. All exams must be completed within 75 minutes of the scheduled exam start time unless other arrangements are made with the instructor prior to the exam.

All exams are closed book and closed notes. Use of books, notes, websites, or any other information from any other source besides the exam itself, is prohibited during all exams.

If GMU is closed on the scheduled date of an Exam, the make-up date and time for the Exam will be announced through the class Canvas website and GMU email.

Extra Credit Opportunities: In-class questions and/or exercises will be presented during most classes. Students can earn extra credit points by answering the questions and participating in the exercises. These questions and exercises will be scored for participation only, not for accuracy. You must be in class and make a good-faith effort to fully complete each question or exercise at the time it is presented to earn the associated points.

Extra credit points earned will be added to your exam scores, but with a few constraints.

- Points will be added only up to the total points for that exam. For example, if you score 97.5 on an exam that is worth 100 points and earned 4 extra credit points for that portion of the course, your adjusted exam score would be 100.
- The maximum extra credit points that may be earned during any portion of the course is 5.
- All extra credit point totals will be reset to zero after each exam. Points will only be added to the exam score corresponding to the part of the course for which the extra credit points were earned.

Participation in these in-class activities is encouraged, but is not required. You will not lose points if you do not participate in the in-class activities.

Missed Coursework: Accommodations will be made for exams and quizzes missed due to sickness, religious observance and other unavoidable schedule conflicts if the instructor is notified prior to the exam date or quiz due date. Without prior notification, late exams and quizzes are subject to a 15% late penalty (e.g., a 15-point reduction for an exam worth 100 points). Exams and quizzes that are not made up or remain unexcused one week after the exam or quiz date are subject to an additional 10% penalty for each additional week it is not completed or remains unexcused. Any quizzes not completed by the associated exam date are subject to a grade of zero. Unusual situations that prevent timely notice to the instructor will be handled on a case-by-case basis.

Collaboration: Students are encouraged to study together and discuss with each other the information and concepts covered in the lectures and recommended readings. Collaboration is permitted for quizzes and in-class questions and exercises so long as all students in the collaboration fully participate and submit their own responses. Simple division of labor (i.e., dividing question or exercise responsibilities within the group) or sharing of answers without honest discussion are not consistent with this policy and are not permitted.

Collaboration of any sort is not permitted during exams.

Use of Artificial Intelligence (AI) Tools: AI Tools of any type are neither needed nor encouraged to be used for this class. Students may use an AI Tool for personal study purposes if they choose, for example to test themselves or organize their own notes, but that is the only permitted use of AI Tools for this class.

Consistent with the Recording of Lectures policy stated above, AI Tools may not be used to take notes during class without prior written approval from the instructor. Similarly, AI Tools may not be used to represent or stand-in for any student at any time during class. Deploying an AI Assistant, for example, is not a suitable substitute for attending class.

Consistent with the Course Materials policy stated above, AI Tools may not be used to repackage and redistribute any class materials or presentations provided by the instructor.

AI Tools may not be used to create any coursework that is submitted to the instructor for credit.

If you have any questions or concerns about AI use for this class, please talk to the instructor.

Grade Postings: All course scores will be posted on the course Canvas website unless otherwise requested.

Unscheduled University Closure: In the event of an unscheduled university closure due to weather or other reasons, please check Canvas and your GMU email for any class announcements. If class cannot meet because of a partial or full campus closure, supplementary activities may be assigned.

Extended Emergency Adaptation: All classes are scheduled to be conducted in person. If an extended emergency situation prevents in-person classes, classes may be shifted to a synchronous online mode (i.e., live online) and conducted through Canvas. You will be told if classes are being shifted to online mode and given instructions on how to access the online system.

Non-Discrimination Commitment: The instructor is committed to providing all students equal opportunity and an educational environment free from any discrimination on the basis of race, color, religion, ethnic national origin (including shared ancestry and/or ethnic characteristics), sex, disability, military status (including veteran status), sexual orientation, gender identity, gender expression, age, marital status, pregnancy status, genetic information, or any other characteristic protected by law. The instructor is also committed to providing an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected. Please talk to the instructor if any actions or incidents in this class or elsewhere run contrary to these commitments.

University Policies

The University Catalog is the central resource for GMU policies affecting student, faculty and staff conduct in university academic affairs. Please refer to the catalog (<https://catalog.gmu.edu>) or the University Policy website (<https://universitypolicy.gmu.edu>) for information on academic and non-academic policies not explicitly specified in the syllabus.

Common policies that affect all courses at GMU are those that are concerned with Academic Standards, Accommodations for Students with Disabilities, FERPA and Use of GMU Email Addresses for Course Communication, and Title IX Resources and Required Reporting. These common policies are listed below for reference. They are also posted at <https://stearnscenter.gmu.edu/home/gmu-common-course-policies/>.

Academic Standards: Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

- Honesty: Providing accurate information in all academic endeavors, including communications, assignments, and examinations.
- Acknowledgement: Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, co-authored pieces, and project reports.

- **Uniqueness of Work:** Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Violations of these standards — including but not limited to plagiarism, fabrication, and cheating — are taken seriously and will be addressed in accordance with university policies. The process for reporting, investigating, and adjudicating violations is outlined in the university's procedures (refer to <https://academicstandards.gmu.edu/academic-standards-code/>). Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

Accommodations for Students with Disabilities: Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at GMU. If you are seeking accommodations, please visit <https://ds.gmu.edu/> for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu. Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor *in advance* of any relevant class meeting, assignment, or exam.

FERPA and Use of GMU Email Addresses for Course Communication: The Family Educational Rights and Privacy Act (FERPA) governs the disclosure of education records for eligible students and is an essential aspect of any course (refer to <https://studentprivacy.ed.gov/ferpa> and <https://registrar.gmu.edu/ferpa/>). Students must use their GMU email account to receive important University information, including communications related to this class. Instructors will not respond to messages sent from or send messages regarding course content to a non-GMU email address.

Student responsibility: Students are responsible for checking their GMU email regularly for course-related information, and/or ensuring that GMU email messages are forwarded to an account they do check.

Title IX Resources and Required Reporting: As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please refer to University Policy 1202: Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence

(<https://universitypolicy.gmu.edu/policies/sexual-harassment-policy/>). Questions regarding Title IX can be directed to the Title IX Coordinator via email to TitleIX@gmu.edu, by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

Student opportunity: If you prefer to speak to someone *confidentially*, please contact one of Mason's confidential employees in Student Support and Advocacy (SSAC), Counseling and Psychological Services (CAPS), Student Health Services (SHS), and/or the Office of the University Ombudsperson.

Title IX

Title IX is a federal civil rights law that prohibits discrimination on the basis of sex under any education program or activity receiving federal funding. GMU receives federal funds in many forms and so is required to comply with Title IX.

Sexual assault and sexual harassment are forms of sex discrimination covered by Title IX. Other issues that are investigated under Title IX include stalking, intimate partner violence, gender-based harassment, sexual exploitation, complicity in the commission of any act prohibited by this policy, and retaliation for good faith reporting of any of these forms of conduct or participation in any investigation or proceeding.

More information regarding Title IX is available at:

- <https://oacc.gmu.edu/access-services/title-ix/title-ix-mason/university-title-ix-statement>
- <https://www.ed.gov/laws-and-policy/civil-rights-laws/title-ix-and-sex-discrimination>

Student Support Resources

GMU has several support resources available to all students. Potentially useful starting points include:

- Mason email: <https://mail.gmu.edu>
- Learning Services: <https://learningservices.gmu.edu>
- Student Health Services: <https://shs.gmu.edu>
- Counseling and Psychological Services: <https://caps.gmu.edu>
- Student Support and Advocacy Center: <https://ssac.gmu.edu>
- University Career Services: <https://careers.gmu.edu>
- Office of the University Ombudsperson: <https://ombuds.gmu.edu>
- Office of Access, Compliance, and Community: <https://oacc.gmu.edu>
- Non-Discrimination resources: <https://oacc.gmu.edu/access-services/non-discrimination>
- Sex- or Gender-based Discrimination and Sexual Misconduct resources:
<https://oacc.gmu.edu/equity-access-services/title-ix/what-title-ix>
- Title IX Contacts at Mason:
<https://oacc.gmu.edu/access-services/title-ix/who-can-i-speak>

Many other resources are listed on the GMU Student Life website: <https://www.gmu.edu/student-life>