

Course Change Request

New Course Proposal

Date Submitted: 04/18/23 10:06 am

Viewing: **GEOL 545 : Planetary Geology**

Last edit: 04/20/23 3:28 pm

Changes proposed by: ggilleau

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

No

Effective Term: Fall 2023

Subject Code: GEOL - Geology

Course Number: 545

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Planetary Geology

Banner Title: Planetary Geology

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 2.5

Repeatable:

In Workflow

1. **AOES Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Graduate
5. Registrar-Courses
6. Banner

Approval Path

1. 04/18/23 4:47 pm
Mark Uhen
(muhen): Approved for AOES Chair

May be only taken once for credit, limited to 3 attempts (N3) **Max Allowable Credits:** 9

Default Grade Mode: Graduate Regular

Recommended Prerequisite(s): A course in Physical or Historical Geology at the undergraduate level.

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(Course/Test Code	Min Grade/Score	Academic Level)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description: Covers the geology and geologic processes of the terrestrial planets, moons, and other small bodies in the solar system including dwarf planets, asteroids and comets. The emphasis is on understanding past and

present surface geologic processes. Observation session at campus observatory may be required outside of class hours.

Justification: What: Creating a new course.

Why: We are proposing to create a graduate section of GEOL 325 (Planetary Geology), which is an elective course for undergraduate geology majors. The purpose of creating the graduate section is particularly to help students in the Bachelors Accelerated Masters (BAM) program, allowing them to take a course that counts both towards their undergraduate geology major requirements and can be used as graduate credit towards their Earth Systems Science MS (ESS MS) degree. This course (GEOL 545) will be available to our advanced undergraduates who have been accepted into the BAM program, as well as other graduate students in the ESS MS degree. This course will also be available for futures students who enroll in our pending Geology and Earth Science PhD program. There have also been requests for a graduate version of the Planetary Geology class from students in other departments, such as biology and astronomy, so it is anticipated that a few students from these departments will enroll in the graduate course as well.

Does this course cover material which crosses into another department? Yes

Impacted Departments:

Department
PHYS - Physics & Astronomy

Learning Outcomes:

- Develop an understanding of what is known and unknown about the surfaces and interiors of planets, moons and other Solar System bodies
- Understand the range of geologic processes occurring throughout the Solar System today
- Understand the evidence for different geologic processes that may have occurred on different Solar System bodies in the past
- Understand the tools and techniques used to study the geology and geologic history of planets, moons and other Solar System bodies

Attach Syllabus [GEOL_545_Syllabus_Fa2023_draft.pdf](#)

Additional Attachments**Staffing:** Dr. Jules Goldspiel**Relationship to Existing Programs:** This is an elective course for the Geology BA and BS degrees and will help students who have entered the BAM program in ESS MS gain both undergraduate and graduate credit, as well as students who enroll in the ESS MS and future Geology and Earth Science PhD program. The course provides a broad planetary Geology background for AOES Geology graduate students who come a non-geology undergraduate degree program, and also for graduate students who have a geology background and are looking to apply their understanding of Earth processes to understanding processes on other planetary bodies with different properties.**Relationship to Existing Courses:** This is a graduate section of the existing GEOL 325 (Planetary Geology)**Additional Comments:****Reviewer Comments**

Key: 18155

**Geology 545
Planetary Geology
Fall 2023 Syllabus**

Meeting Times and Location

Mondays 4:30 –7:10 pm
Exploratory Hall 1005

Instructor

Dr. Jules Goldspiel
Department of Atmospheric, Oceanic and Earth Sciences

Office: Exploratory Hall 3414
Mailbox in EXPL 3400

Office Hours: Tuesdays 3:30–4:30 pm
Other days and times by appointment

e-mail: jgoldspi@gmu.edu (best contact method)

Course Information

3 Credits

Prerequisites: GEOL 101 (Introductory Geology I) or GEOL 102 (Introductory Geology II)

This course will focus on the geology and geologic processes relevant to the terrestrial planets, moons, and other Solar System bodies including dwarf planets, asteroids and comets. The emphasis will be on understanding past and present surface geologic processes. The geology of Earth will not be covered directly, but geologic features and processes on Earth will be compared and contrasted with those on other planetary bodies when relevant.

Participation in one Observation Night at the GMU Observatory is required outside of class hours.

The goals of this course are for students to:

- Develop an understanding of what is known and unknown about the surfaces and interiors of planets, moons and other Solar System bodies
- Understand the range of geologic processes occurring throughout the Solar System today
- Understand the evidence for different geologic processes that may have occurred on different Solar System bodies in the past
- Understand the tools and techniques used to study the geology and geologic history of planets, moons and other Solar System bodies

Students will find it helpful to have ready access to a scientific calculator or spreadsheet program.

Recommended Course Textbook

Introduction to Planetary Geomorphology, 2013, Ronald Greeley, Cambridge University Press.

Grade Scale

A	≥ 90%	Letter grades will be determined by the percentage of total points possible, with point values weighted as indicated in the table below. The grade scale is subject to change if the class mean is higher or lower than expected, but any such change would be more favorable to students, i.e., the cutoffs for each letter grade could be at lower percentages than indicated by this scale but they will not be higher.
B	≥ 80%	
C	≥ 70%	
D	≥ 60%	
F	< 60%	

Letter grade +/- qualifiers will be used for grades near the letter grade limits.

Required Coursework & Grading Weights

The graded coursework for this class and the weight of each component is as listed below.

Weight	GEOL 545 Coursework
20%	Homework (5 assignments total)
10%	Semester Exercise
5%	Observation Night participation
10%	Independent Project
15%	Preliminary Exam I
15%	Preliminary Exam II
25%	Final Exam

Homeworks will generally involve calculations, graphing and/or data analyses related to topics discussed in class.

The Semester Exercise will involve collecting and summarizing planetary surface data using publicly available data and software tools.

The Independent Project will be a short, but detailed, data collection and analysis project of a specific type and for a specific planetary body chosen by the student in consultation with the instructor.

Tentative Course Schedule

Week	Date	Topic	Textbook Chapters	Homework Assigned
1	08/21	The Solar System & Planetary Exploration	1, 2	
2	08/28	Planetary Geologic Processes	3	#1
3	09/04	<i>Labor Day – No Class</i>		
4	09/11	The Moon & Surface Ages	4	
5	09/18	Mercury & Planetary Body Cooling	5	#2
6	09/25	Venus & Relevance of Atmospheres	6	
7	10/02	<i>Preliminary Exam I</i>		
8	10/10	Mars System & Gradation [TUESDAY CLASS]	7	
9	10/16	Mars System & Basic Planetary Properties		#3
10	10/23	Jupiter System & Tides	8	
11	10/30	Saturn System & Ring Dynamics	9	#4
12	11/06	Uranus System & Neptune System	10	
13	11/13	<i>Preliminary Exam II</i>		
14	11/20	Dwarf Planets & Small Solar System Bodies		#5
15	11/27	Meteorites, Exoplanets & Course Review	11	
16	12/11	<i>Final Exam (4:30 pm – 7:15 pm)</i>		

If GMU is closed on the scheduled date of the Final Exam, the make-up date and time of the Final Exam will be announced. Check Blackboard and e-mail.

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

Other Important Dates

- Aug 28 Last day to add classes
- Sep 05 1st drop deadline (full tuition refund, no record on transcript)
- Sep 12 2nd drop deadline (50% tuition refund, no record on transcript)
- Sep 26 Last day for unrestricted Self-Withdrawal (W on transcript) [available to undergrads only]
- Oct 26 Last day for Selective Withdrawal (W on transcript) [available to undergrads only]
- [TBD*] Observation Night 1 (Alternate date [TBD] if weather is bad on primary date)
- [TBD*] Observation Night 2 (Alternate date [TBD] if weather is bad on primary date)
- Nov 06 Semester Exercise due

* Observation Nights are all weather permitting. Status will be announced on the scheduled day.

Course Policies

Electronic Devices: The use of electronic devices (computer, tablet, phone and the like) is permitted during class. While in class, your phone ringer and any other audible alerts on your devices must be off. Be respectful of your peers and instructor and do 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 disruptive to the class.

You may have to use University computers as part of the required work in this course. All standard University policies apply to the use of University computers and University computer systems for this course. Please see the GMU policies website (<https://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>) for a summary of the University computer policies.

Calculators are the only aid that may be used during exams. If you plan to use a calculator function on a phone, tablet or other electronic device during an exam, you must only use the calculator function. No other use of electronic devices is allowed during exams, i.e., you may not use electronic devices to access notes or any other information during exams.

Course Materials and Presentations: All course materials and presentations (e.g., instructor notes, lectures, lecture outlines, lecture charts, assignments, exams, demonstrations) are for course use only. *They may not be shared, posted or in any way redistributed outside of the course, either electronically or as hardcopy.*

Recording of Lectures: Lectures and demonstrations may *not* be electronically recorded without prior permission of the instructor and completion of the appropriate University Recording/Lecture Notes Agreement form. The opinions, questions or comments of other class members must not be played back to anyone outside of the class.

Attendance: Students are expected to attend class regularly. However, attendance is not strictly required except for one Observation Night. The Observation Night will be held outside of regular class time. You must fully participate in one Observation Night to receive full credit for this assignment.

Assignments: Homework assignments will be posted on Blackboard on the days listed in the course schedule. Except when specifically noted, homework assignments are due by the start of class (7:20 pm) one week after they are issued. Assignments may be e-mailed or handed directly to the instructor. *Do not leave assignments in the instructor's office mailbox.*

Exams: The two Preliminary Exams will be taken during the regular class meeting time on the days listed in the course schedule. The time and date for the Final Exam is listed on the course schedule. All exams are closed book and closed notes.

Late Assignments and Missed Exams: Reasonable accommodations will be made for late assignments and missed exams due to sickness, religious observance and other unavoidable schedule conflicts if the instructor is notified prior to the date the assignment is due or exam given. Unusual situations that prevent advance notice to the instructor will be handled on a case-by-case basis. In any event, assignments and exams that are not turned in, are not made up or remain unexcused one week after the scheduled completion date are subject to a grade of zero.

Collaboration: Students are encouraged to study together and discuss with each other the information and concepts covered in the lectures and course readings. Any discussions and collaborations must be done in accord with all University and local authority COVID-19 protocols, policies and regulations. For more information on health and safety protocols, see GMU's Safe Return to Campus website (<https://www.gmu.edu/safe-return-campus>). Collaboration on homework assignments and the Semester Exercise is permitted so long as all students in the collaboration fully participate in the discussion of all

questions, do a fair share of the collaborative work, and do their own write-ups. Simple division of labor (i.e., dividing questions within the group) is not consistent with this collaboration policy.

Collaboration of any sort is not permitted during exams.

Grade Postings on Blackboard: Your assignment and exam scores will be posted on Blackboard unless otherwise requested. Please tell the instructor if you do not want your scores posted on Blackboard.

Unscheduled University Closure: In the event of an unscheduled University closure or access limitation due to weather or other reasons, check Blackboard and your GMU e-mail for any class announcements. If class cannot meet because of the closure or access limitations, supplementary activities may be assigned.

University Policies

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

Academic Integrity: GMU is an Honor Code university; please see the Office for Academic Integrity (<https://oai.gmu.edu>) for a full description of the code and the honor committee process. The principle of academic integrity is taken seriously and violations are treated gravely. Three fundamental principles to follow at all times are: (1) collaboration on coursework may or may not be permitted (see policies for specific courses), but either way all work submitted must be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules for collaboration on a particular assignment, ask for clarification. Another aspect of academic integrity is the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives and traditions.

Electronic Communications: The instructor will only use the GMU e-mail or Blackboard systems for electronic communications with students. To make such communications easier, it is requested that all student electronic communications to the instructor be sent through your GMU e-mail account or through Blackboard. Please do not use personal e-mail accounts. For more information about student e-mail accounts, please see the GMU mail website (<http://mail.gmu.edu>).

Disability Accommodations: All academic accommodations must be arranged through Disability Services. If you need academic accommodations, please contact Disability Services at 703-993-2474 or talk to the instructor. See also the Disability Services website (<https://ds.gmu.edu>) for more information.

Diversity: Through its curriculum, programs, policies, procedures, services and resources, GMU strives to maintain a quality environment for work, study and personal growth. An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals.

Diversity is broadly defined to include such characteristics as, but not limited to, race, color, ethnicity, national origin, religion, age, disability, gender identity and expression, pregnancy status, sex and sexual orientation. Diversity also entails different viewpoints, philosophies and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

Students, instructors and staff are all expected to uphold GMU's commitment to equitable access and meaningful inclusiveness for all within the GMU community.

Sexual Misconduct and Interpersonal Violence: GMU is committed to providing a safe learning, living and working environment. Your experience at Mason is meant to be vibrant and dynamic, and one that includes ample opportunities for exploration of self, identity and independence. Sexual misconduct and

incidents of interpersonal violence deeply interrupt that experience, and GMU is committed to maintaining a campus that is free of such incidents.

GMU encourages individuals who have been sexually harassed, assaulted or subjected to sexual misconduct to seek assistance and support. Confidential resources that are available on campus include: University Title IX Coordinator, Counseling and Psychological Services (CAPS), Student Support and Advocacy Center (SSAC), and Student Health Services (SHS). Please note that most all other members of the University community are not considered confidential resources and are required to report incidents of sexual misconduct or other prohibited conduct to the University Title IX Coordinator.

Title IX

Title IX is a federal civil rights law that was passed as part of the Education Amendments of 1972. It 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 prohibited by Title IX. Other issues that are investigated under Title IX include stalking, intimate partner violence, gender-based harassment, sexual exploitation, complicity and retaliation for good faith reporting of any of these forms of conduct or participation in any investigation or proceeding.

For more information see <https://diversity.gmu.edu/title-ix/what-title-ix/university-title-ix-statement> and https://www2.ed.gov/about/offices/list/ocr/docs/tix_dis.html.

Student Support Resources

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

- Learning Services: <https://learningservices.gmu.edu>
- Tutoring Resources: <https://learningservices.gmu.edu/tutoring-resources>
- Student Health Services: <https://shs.gmu.edu>
- Counseling and Psychological Services: <https://caps.gmu.edu>
- Student Support and Advocacy Center: <https://ssac.gmu.edu>
- Diversity, Equity and Inclusion: <https://diversity.gmu.edu>
- Sexual Misconduct, Harassment and Discrimination resources:
<https://diversity.gmu.edu/equity-access-services/title-ix>
- University Title IX Coordinator: <https://diversity.gmu.edu/title-ix/who-can-i-call>
- University Career Services: <https://careers.gmu.edu>

Many other resources are listed under Student Life: <https://www.gmu.edu/student-life>

Coronavirus/COVID-19 Information and Resources

While the risk of major disruption to classes and other University activities has been reduced, COVID-19 and other community health issues remain a potential threat to the normal operations of classes and other activities at GMU. Please pay attention to announcements regarding changes that may be made to this class and other classes as conditions warrant. Should changes occur, you will be required to follow the enacted University health policies, procedures and associated requirements.

Information and resources related to COVID-19 and potential impacts on GMU procedures operations can be found at GMU's Safe Return to Campus site (<https://www.gmu.edu/safe-return-campus>).

Facemasks: Students are required to follow the GMU facemask policy that is in force on each class meeting day (see <https://www.gmu.edu/safe-return-campus/personal-and-public-health/face-coverings>).