

**Geology 306-001  
Soil Science  
Spring 2026 Syllabus**

**Class Meeting Time and Location**

Thursdays 10:30 am – 1:10 pm  
Exploratory Hall 1005 (in person)

**Instructor**

Dr. Jules Goldspiel

Office: Exploratory Hall 3414

Office Hours: Tuesdays 12:30 – 2:30 pm  
Other days and times by appointment

Email: jgoldspi@gmu.edu (best contact method)



**Course Description**

3 Credits

Prerequisites: GEOL 101 (Physical Geology)  
GEOL 103 (Physical Geology Lab)  
CHEM 103 (Chemical Science in a Modern Society) or CHEM 211 (General Chemistry I)  
Or similar lab-science courses in each of Geology and Chemistry

This course is intended to provide an introduction to the physical, chemical, hydrologic and biotic properties of soils. The course will focus on the composition, classification and origin of soils. It will also cover the interactions and effects of water and organisms in soils, issues relating to soil quality, and processes that deplete soils.

It is anticipated (but not guaranteed) that a few excursions to sites on or near campus will be conducted during some class meetings. The purpose of such trips, if taken, will be to illustrate certain topics discussed in class.

**Expected Learning Outcomes**

The goal of this course is that upon successful completion of it, students will:

- Know the range of physical, chemical and hydrologic properties common in soils
- Understand how soil properties relate to soil quality
- Be able to read, understand and describe soil profiles
- Be familiar with the USDA soil classification scheme and understand how soils are mapped
- Understand that soil is a complex and biologically active zone where sunlight, water, atmosphere, and living things mix and interact with Earth's rocks and minerals
- Understand how soils form and support life
- Understand that soil compositions are constantly altered in response to changing conditions
- Understand how soils can be chemically and nutritionally depleted, and how soils can also be completely lost through erosion and transport
- Appreciate the importance of soil stewardship
- Appreciate that a knowledge of soils is necessary for site assessment, urban and regional planning and pollution mitigation
- Appreciate that the soils on Earth are unique to Earth

**Course Textbook (Recommended)**

*Soil Science Simplified*, 5<sup>th</sup> Edition, 2016, D.P. Franzmeier, W.W. McFee, J.G. Graveel and H. Kohnke, Waveland Press. ISBN 13: 978-1-4786-2907-8

Available in paperback format from the publisher (<https://waveland.com>) and in electronic formats from several sources (see publisher site for some electronic options). Note that a new 6th Edition is to be released soon.

## Tentative Course Schedule

Week	Date	Topic / Exam	Textbook Chapter	Quiz
1	01/22	Course Information & Soil Science Overview	1	
2	01/29	Soil Formation Factors and Processes	5	#1
3	02/05	Soil Formation Processes and Physical Properties	3	#2
4	02/12	Clays and Cation Exchange Capacity	2	#3
5	02/19	Soils and Climate	4	#4
6	02/26	Soils and Water	4	#5
7	03/05	<i>Preliminary Exam I</i>		
8	03/12	<i>Spring Break – No Class</i>		
9	03/19	Soil Morphology and Classification	6, 7	#6
10	03/26	Soils in the Field and Soil Surveys	8	#7
11	04/02	Soil Organic Matter and Microbes	9	#8
12	04/09	Soil Nutrients and Other Chemical Components	10	#9
13	04/16	Soil Erosion and Erosion Control	11, 12	#10
14	04/23	<i>Preliminary Exam II</i>		
15	04/30	To Be Determined (Possible options: Course Review, Potential for Soils in Planetary Environments, expansion of previous topic and/or additional topic not previously discussed)		
16	05/07	<i>Final Exam (10:30 am - 1:15 pm)</i>		

Quiz numbers in the schedule are the dates on which the specific quizzes will be released.

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

### Key Dates for Class Enrollment

Jan 27 Last day to add classes

Feb 03 1<sup>st</sup> drop deadline (full tuition refund, no record on transcript)

Feb 10 2<sup>nd</sup> 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)

## Required Coursework and Grading Weights

GEOL 306 Required Coursework	Weight Towards Final Grade
Quizzes	20%
Exercises	10%
Preliminary Exam I	20%
Preliminary Exam II	20%
Final Exam	30%

The graded coursework for this class and the weight of each component is as listed in the table at left. The weights shown for the quizzes and exercises are the weights for the combined score of all quizzes and exercises completed during the semester.

Quizzes will cover facts and concept details from lectures. They are intended to check your understanding of specific information and concept details discussed since the last quiz. Each quiz will consist of questions in multiple choice and/or short answer format. All quizzes will be time-limited and scored for accuracy.

Exercises will cover various geological, physical, chemical and/or hydrologic aspects of the course. They will generally involve observations, measurements, practical calculations and/or concept questions. Exercises will be scored for effort, legibility and completeness rather than accuracy, and most, if not all will be completed in class.

## 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%	70.0 – 77.9%	65.0 – 69.9%	50.0 – 64.9%	< 50%

Course grades will be determined by the weighted percentage of total points possible (refer to Required 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. If any changes are made, the changes will be in a manner that is favorable to student grades (i.e., if the schema is revised, the change will set the cutoff for a grade to a lower weighted score percentage).

## Course Policies

Attendance: Students are expected to attend class regularly, but attendance is not strictly required. Note, however, that most if not all exercises will be completed in class and you must be in class to do the exercises.

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 must not be distractive or disruptive to the class, and any use of electronic devices must be respectful of your peers and instructor while class is being conducted.

For example, audible alerts on your devices must be off while in class. 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 during class or during exams without an approved accommodation or prior approval from the instructor.

Calculators are the only aid that may be used during exams. A calculator application on a phone, tablet or other device may be used during an exam, but only the calculator function on that device may be used. Except for taking online exams themselves in the event the class transitions to online, no other use of any device is allowed during exams.

Please also refer to the GMU policies 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 an approved accommodation or 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.

Exams: Preliminary Exams will be taken during the class meeting time on the dates listed in the course schedule. The time and date for the Final Exam is as listed on the course schedule. If GMU is closed on the scheduled date of an Exam, a new Exam date and time will be announced through the class Canvas website and GMU email.

All exams are to be taken in person unless emergency situations require shifting to an online format.

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.

Quizzes: Quizzes will be posted on Canvas on the dates listed in the course schedule. Except when specifically noted otherwise, quizzes are due by the start of class (10:30 am) one week after they are issued. Quizzes must be completed within Canvas and outside of class.

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.

Quizzes will be graded for accuracy.

Exercises: At several points during the semester, exercises will be distributed in class. Except when specifically noted otherwise, exercises are due at the end of class (1:10 pm) on the same day they are issued.

You must be in class to complete and submit the exercises. Make-up exercises will not be issued, but a single exercise may be missed without penalty.

Exercises will be graded for effort, legibility and completeness rather than for accuracy.

Late or Missed Coursework: Accommodations will be made for quizzes and exams missed, due to sickness, religious observance and other unavoidable schedule conflicts if the instructor is notified prior to the date the quiz is due or date the exam is given. Without prior notification, late exams and quizzes are subject to a 15% reduction of the possible score (e.g., a 15-point reduction from an exam worth 100 points). Unusual situations that prevent timely notice to the instructor will be handled on a case-by-case basis. In any event, quizzes and preliminary exams that are not completed, or remain unexcused, two weeks after the scheduled due date or exam 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 recommended readings. Collaboration on quizzes and exercises is permitted so long as all students in the collaboration fully participate in the discussion of all questions and do a fair share of the collaborative work. Simple division of labor (i.e., dividing questions within the group) is not consistent with this collaboration policy and is not permitted.

Collaboration of any sort is not permitted during exams.

Potential for Field Trip: One or more field trips (or excursions) to a local site of soils interest may be conducted. Any such trip will be taken during class and the site will be within walking distance of the classroom. Any such trip will also have an exercise associated with it.

Accessing the field trip sites may require walking on unpaved, soft and/or sloped surfaces. Students who cannot easily walk on such surfaces should inform the instructor at the start of the semester so that appropriate alternatives can be devised.

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.

### **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.

In addition, students must abide by the GMU Common Policies Addendum. Please consult these policies (posted at <https://stearnscenter.gmu.edu/home/gmu-common-course-policies/>) so that you know your rights and responsibilities with respect to Academic Standards, Accommodations, FERPA, Title IX and other policies.

### **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>