

GEOL 304/504: SEDIMENTARY GEOLOGY

Fall 2023 Syllabus

Professor: Dr. Geoff Gilleaudeau

Lecture Meeting Time: Mondays and Wednesdays 9:00 to 10:15am

Lecture Meeting Place: Exploratory Hall Room 1005

Professor's Office: Exploratory Hall Room 3452

Office Hours: By appointment (email me or talk to me after class)

Professor's Email: ggilleau@gmu.edu

Course Textbook: Principles of Sedimentology and Stratigraphy, Fifth Edition by Sam Boggs Jr.

Laboratory Instructor: Amanda Mullen

Laboratory Meeting Time: Mondays 1:30 to 4:15pm

Laboratory Meeting Place: Exploratory Hall Room 1005

Laboratory Instructor's Office: Exploratory Hall Room 3457

Laboratory Office Hours: Mondays and Tuesdays 11am to 12pm, Wednesdays 1 to 2pm (virtual: <https://gmu.zoom.us/j/2924816430>)

Laboratory Instructor's Email: amullen5@gmu.edu

Course Goals:

Sedimentary strata represent the pages of Earth's history book and, in this course, we will learn how to properly read that history from the scale of individual sedimentary grains to macrostratigraphic changes through large intervals of geologic time. Topics will include: weathering and the origin of sedimentary grains, sediment transport and fluid flow, sedimentary structures, siliciclastic and carbonate petrology and diagenesis, depositional environments and facies models, lithostratigraphy and biostratigraphy, as well as sequence stratigraphy and basin analysis. The overarching goal is to become proficient readers of Earth's vast, complex, yet critically important sedimentary record. This will be achieved through interactive lectures and labs, with emphasis also placed on our local natural laboratory—the Appalachian Mountains.

*“What clearer evidence could we have had of the different formation of these rocks, and of the long interval which separated their formation, had we actually seen them emerging from the bosom of the deep?...**The mind seemed to grow giddy by looking so far into the abyss of time.**”*

— James Hutton



Grading Scheme for GEOL 304:

15%: Mid-term exam 1

15%: Mid-term exam 2

15%: Final exam

35%: Laboratory component of the course

20%: Field trip assignments

*Lab assignments are due at the beginning of the following lab period. 10% will be deducted for each week late.

*There are 11 labs scheduled for the semester. ONE lab grade will be dropped, so that your final lab grade will consist of your 10 best labs.

*There are two required weekend field trips scheduled for this semester. On Saturday, September 30th, we plan a day trip to Sideling Hill in Maryland. On the weekend of November 4th and 5th, we plan an overnight trip to Corridor H in West Virginia. We also plan to spend the entire day (9am to 4pm) at the USGS core facility in Reston, VA on Monday, November 13th. This will be in lieu of class and lab on that day. These trips will form the basis of the field trip assignments.

*All exams will be OPEN NOTE. This means you cannot have the textbook or your entire notebook with you for the exam; rather, you will be allowed to bring FIVE PIECES OF PAPER with you to the exam containing information of your choosing. This will encourage you to summarize information and re-write your notes before the exam, which will hopefully lead to greater retention of the material than normal cramming for an exam.

Grading Scheme for GEOL 504:

10%: Mid-term exam 1

10%: Mid-term exam 2

15%: Final exam

35%: Laboratory component of the course

15%: Field trip assignments

15%: Term paper

Final Grading Scale:

97 to 100% = A+

93 to 97% = A

90 to 93% = A-

87 to 90% = B+

83 to 87% = B

80 to 83% = B-

77 to 80% = C+

73 to 77% = C

70 to 73% = C-

67 to 70% = D+

63 to 67% = D

60 to 63% = D-

Less than 60% = F

Semester Schedule:

Day	Date	Lecture Topic	Lab Topic
Mon	21-Aug	Introduction	No lab on first week
Wed	23-Aug	Weathering and soils	
Mon	28-Aug	Grain size and sorting; sediment transport and fluid flow	Grain size analysis
Wed	30-Aug	Grain shape and packing; bedforms	
Mon	4-Sept	No Class Labor Day	No Class Labor Day
Wed	6-Sept	Sedimentary structures	
Mon	11-Sept	Siliciclastic petrology	Sedimentary structures
Wed	13-Sept	Siliciclastic diagenesis	
Mon	18-Sept	Carbonate chemistry	Siliciclastic hand samples
Wed	20-Sept	Carbonate petrology	
Mon	25-Sept	MIDTERM 1	Siliciclastic thin sections
Wed	27-Sept	Appalachian geology	
Sat	30-Sept	FIELD TRIP: Sideling Hill, MD	
Mon	2-Oct	Carbonate diagenesis	Carbonate hand samples
Wed	4-Oct	Other chemical sediments	
Mon	9-Oct	No Class Fall Break	No Class Fall Break
Tues	10-Oct	Introduction to facies models; alluvial environments	Carbonate thin sections
Wed	11-Oct	Fluvial environments	
Mon	16-Oct	No class, GSA meeting	No lab, GSA meeting
Wed	18-Oct	Deltaic environments	
Mon	23-Oct	Coastal and shelf environments	Stratigraphic columns
Wed	25-Oct	Slope and deep-sea environments	
Mon	30-Oct	Carbonate environments	Facies and depositional environments
Wed	1-Nov	MIDTERM 2	
Sat-Sun	4-Nov to 5-Nov	FIELD TRIP: Corridor H, WV	
Mon	6-Nov	Lithostratigraphy	Well logging
Wed	8-Nov	Biostratigraphy	
Mon	13-Nov	FIELD TRIP: USGS core facility	FIELD TRIP: USGS core facility
Wed	15-Nov	Chemostratigraphy	
Mon	20-Nov	Chronostratigraphy and the geologic time scale	Biostratigraphy
Wed	22-Nov	No Class Thanksgiving	
Mon	27-Nov	Sequence stratigraphy	Sequence stratigraphy
Wed	29-Nov	Secular trends in the sedimentary record and Earth history	
Mon	11-Dec	FINAL EXAM (currently scheduled for 7:30-10:15am)	

Academic Integrity

The integrity of the University community is affected by the individual choices made by each of us. Mason has an Honor Code with clear guidelines regarding academic integrity. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted 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 on a particular assignment, ask for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. If you have any doubts about what constitutes plagiarism, please see me.

Disability Accommodations

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474

Privacy

Students must use their Mason email account to receive important University information, including communications related to this class. I will not respond to messages sent from or send messages to a non-Mason email address.