

Sedimentology and Stratigraphy  
GEL/MAR 346  
Syllabus Fall, 2017

Professor: Jacob O. Sewall  
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**Class Meetings:** Monday, Wednesday, Friday, 11:00 – 11:50 AM, Boehm Bldg. 126

**Laboratory Meeting:** Monday, 2:00 – 5:00 PM, Boehm Bldg. 126

**Course Objectives:** Sedimentology and Stratigraphy is an upper-division, writing-intensive Geology course intended to develop:

- Your knowledge of sediments and sedimentary processes
- Your ability to interpret past depositional environments, sedimentary events, and basin evolution
- Your command of technical geological skills such as rock identification, interpretation of subsurface data, and the creation of stratigraphic columns
- Your ability to write succinctly and effectively about rocks

You will be asked to first master the nomenclature and practical skills of Sedimentology and Stratigraphy and then asked to apply that nomenclature and skill set in sophisticated analyses.

**Course requirements:** As an upper-division Geology course, Sedimentology and Stratigraphy expects and builds upon the basic foundation in geologic knowledge and rock/earth history interpretation that you developed in Physical Geology and Historical Geology. Both of those courses (GEL 100 or GEL 020 and GEL 102) are prerequisites for this class.

**Textbook:** The text for this class is “officially” the fifth edition of *Principles of Sedimentology and Stratigraphy* by Sam Boggs Jr. *However*, any “recent” edition will work (the third edition is my favorite).

**Attendance/late policy:** This class meets for 6 hours a week. During that time we will have a variety of lecture, hands-on, and field activities. Missing a class means you miss an activity. Given that the activities and information presented in class meetings constitute the majority of your grade, it is strongly recommended that you attend all class meetings. Make-up exams will be given **only** by prior arrangement or in the case of documented emergencies. Labs/homework assignments will be accepted late **only** by prior (i.e. before the day they are due!) arrangement.

**E-mail policy:** E-mail is the primary mode of communication in many arenas today, e-mail correspondence, like all writing in this course, should be professional, clear, and grammatically correct. E-mail subject lines **must** contain the course number (**GEL 346**). The body of the e-mail should contain a greeting, a concise, clearly written description of the question, problem, or topic, and a closing. E-mail messages *that conform to this standard* will generally be answered within one business day.

**Honor Code and Special Needs:** Strict accordance with the University policies concerning plagiarism, cheating, etc. is expected. Science is, however, a collaborative endeavor. You are encouraged to discuss homework/lab assignments with each other and assist each other in the field – just as active scientists do. You are, however, also (again, just like active scientists) expected to be responsible for your own answers or, if appropriate, give clear credit to the work of others. Any student with special needs or circumstances is encouraged to meet with the instructor to discuss them; you may also contact Disability Services at the Disability Services Office, 215 Stratton Administration Building, 610-683-4108.

### **Gender- Based Crimes**

Educators must report incidents of gender-based crimes, including sexual assault, sexual harassment, stalking, dating violence, and domestic violence. If a student discloses such incidents to me during class or in a course assignment, I am not required to report the disclosure, unless the student was a minor at the time the incident occurred. Regardless of the student's age, if the incident is disclosed to me outside the classroom setting or a course assignment, I am required by law to report the disclosure, including relevant details, such as the names of those involved in the incident, to Public Safety and Police Services and to Mr. Jesus Peña, Title IX Coordinator.

**Labs/Field trips:** There will be lab exercises each week. Some of those labs will take place in the lab room; some will involve a field component. The field component will strive to take only the three-hour lab period, however, it is possible that field exercises will require more time.

**Original Research:** There is a significant body of pedagogical research showing that involvement in original research is a transformative learning experience for undergraduate students and greatly enhances their chances of career success. Therefore, this course involves an original research component. Throughout the semester, you will work in small, mentored groups on an original research project. Research days will typically be Fridays, however, as the semester progresses and your skill and knowledge base grow, we will devote increasingly larger blocks of time to this activity. What will we discover? I don't know! That's the fun of research!

**Rock of the Day:** Your peers have consistently indicated that regular practice in identifying and writing about rocks is one of the most useful aspects of this course. To that end, you will have a 'Rock of the Day' exercise to complete each day of class from September 18<sup>th</sup> through mid-November.

**Reading Questions:** The textbook is excellent, but it is also a tad on the dense side. To help you focus your forays into the text, reading questions will be assigned in preparation for each class period. Reading questions will be available on D2L and you are expected to come to class with complete answers for each question. Each set of reading questions may be turned in for up to **5 extra pts each (120 pts total for reading questions)**. If you are turning in answers to the reading questions, please make sure they are neat or (preferably) typed.

### **Tentative Grading/Feedback Scheme:**

There will be no curving of grades in this course. Assessment of your performance will be based on your proficiency in various activities and the total numbers of points that you accumulate over

the semester. Your final grade in the course will be based on the number of points that you have amassed vs. a possible total of 1000 points: A = 93-100, A- = 90-92, B+ = 87-89, B = 83 – 86, B- = 80-82, C+ = 77-79, C = 70-76, D = 60-69, F = 0-59.

**Tentative Points Breakdown:**

- Rock of the Day Exercises: 250 pts**
- Field/Lab Writing Assignments: 200 pts**
- Lab Exercises: 300 pts**
- Research Project Activities: 250 pts**

**Probable Topic Schedule, Course Organization, and Due Dates**

(Note: Items are due at the beginning of class or lab on the given date unless otherwise indicated. Late items will be charged 10% per day late beginning after the start of lab/class unless prior arrangements are made.)

<b>Course Week</b>	<b>Topic(s)</b>	<b>Chapters to Read</b>
Aug. 28 – Sept. 1	Making, moving, and characterizing sediments	1, 2, 3
Sept. 6 – 8		
Sept. 11 – 15	Sedimentary Structures, Sandstones, Conglomerates and Mudrocks	4, 5
Sept. 18 – 22		
Sept. 25 – 29	Terrestrial Clastic Depositional Environments	8 (p. 215 – 220)
Oct. 2 - 6	Terrestrial and Marginal Marine Clastic Depositional Environments	8 (p. 211 – 215; 228 – 243) 9 (p. 246 – 260)
Oct. 10 – 13	Terrestrial and Marginal Marine Clastic Depositional Environments	8 (p. 220 – 228) 9 (p. 260 – 267)
Oct. 16 – 20	Carbonate Sedimentary Rocks and Marine Depositional Environments	6, 10
Oct. 23 – 27	Carbonate Shelf Environments	11
Oct. 30 – Nov. 3	Carbonate Shelf Environments Lithostratigraphy	11 12
Nov. 6 – 10	Marginal Marine Environments Lithostrat and Well Logging	9 (p. 268 – 277) 12
Nov. 13 – 17	Tectonics and Sedimentation	16
Nov. 20	Seismic Stratigraphy	13
Nov. 27 – Dec. 1	Tectonics, Sedimentation, and Basin Analysis	16
Dec. 4 – 8	Research Projects	
Dec. 11, 11:00	Final Exam Period	

<b>Lab Week Of:</b>	<b>Activity</b>	<b>Deliverables</b>	<b>Due Date</b>
Aug. 28	Grain Size Analysis	Grain Size Abstract <b>Draft</b> , Data, and Figures	Sept. 6
	Research Brainstorming	Research Brainstorming	Sept. 11
		Final Grain Size Abstract, Data, and Figures	<b>Sept. 29</b>
Sept. 11	Lab Methods Instruction and Research Familiarization Trip	Completed Activity	Sept. 11
	Abstract Revisions		<b>Sept. 29</b>
Sept. 18	Clastic Lab	Completed Lab	Sept. 25
	Research Reading Synopsis and Questions	Completed Synopsis and Questions	<b>Oct. 6</b>
Sept. 25	Paleocurrent Field Trip	Paleocurrent Analysis and Report	<b>Oct. 20</b>
Oct. 2	Stereonet and Rose Diagram Prep.		
Oct. 10	Research Project Trip #1	Field Data and Notes	<b>Oct. 23</b>
Oct. 16	Carbonate Lab	Completed Lab	Oct. 23
Oct. 23	Research Project Trip #2	Field Data and Notes	<b>Oct. 27</b>
		Preliminary Analyses	
Oct. 30	Boreholes and Well Logs Part 1	Completed cross sections, write up, and 3-D Facies Model	Nov. 20
Nov. 6	Boreholes and Well Logs Part 2		
Nov. 13	Research Project Trip #3	Field Data and Notes	<b>Nov. 17</b>
		Completed Analyses	<b>Nov. 29</b>
Nov. 20	Seismic Stratigraphy Lab	Completed Lab	Nov. 27
Nov. 27	Basin Decompaction Lab	Completed Lab	Dec. 4
Dec. 4	Research Projects	Final Abstracts and Posters	<b>Dec. 11</b>