

**Course Syllabus**  
**Sedimentary Geology & Paleontology (GLY 315)**  
**University at Buffalo**

**Instructor:** Dr. James Boyle  
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**Office:** Cooke 453  
**Lectures:** MWF 2:00PM-2:50PM, Cooke 434

**Lab Instructor:** Hayley Martinez  
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**Office:** Cooke 15  
**Labs:** M/W 3:00-5:30PM, Cooke 15  
**Student Hours:** M/W 11-12PM

**Dr. Boyle Student Hours:** Monday 10-11 AM, Thursday 12-1 PM, or by appointment  
**Student Hours Zoom Room**  
<https://buffalo.zoom.us/j/4027616352?pwd=NHcreUErRFFCVzITNVZBZ0FGYmp2UT09>

**Course Description:**

Sedimentary Geology & Paleontology will be an in-depth look at the processes of erosion, transport, and deposition of sediments across various environments on the Earth. We will then tie those sediments to their rock equivalents to establish how geologists can interpret the rock record to reveal past environments. Finally, we will look to the fossil record and how much of our knowledge of past life is determined by sedimentary processes.

**Course Objectives and Learning Outcomes:**

The purpose of this course is to introduce the core concepts of sedimentology, stratigraphy, and paleontology and how they are all intertwined in interpretations of the past Earth.

In particular we will focus on....

- 1) Understanding how properties of the environment determine the observed physical properties of sediments we observe in modern environments
- 2) Translating those characteristics to the rock record to interpret past environments
- 3) Understanding the basics of evolution, sampling, and environmental change to the Earth's biosphere over time.

**Course Materials:**

**Suggested Text:** There is no required textbook for the course. However, much of the material will come from two textbooks that may be worth acquiring if you are interested in pursuing further courses in stratigraphy/paleontology. "Principles of Sedimentology and Stratigraphy" by Sam Boggs Jr. (5<sup>th</sup> edition), ISBN: 978-0-321-64318-6 and "Introduction to Paleobiology and the Fossil Record" by Michael Benton & David A.T. Harper (2<sup>nd</sup> edition), ISBN: 978-1-119-27285-4.

**Other required material (for lab):**

Hand lens (loupe). For example: HTS 203A0 Chrome Triplet Jeweler's Loupe (anything between 10x and 30x is fine, prices <\$15). This will be needed for future geology courses as well. You will also need a lab notebook to take notes in during the course field trips. This can be a standard spiral notebook but you may also like to use a more standard field notebook, such as [Rite-in-the-Rain](#)

**GRADING POLICY: (SEE COURSE SCHEDULE AT THE END OF THIS DOCUMENT)**

Final grades are letter-based (see [here](#) for more information on UB grade policy) and are a weighted average of quizzes, discussion boards, and min-exams throughout the semester. There is no final exam during final exam week at the end of the semester.

Learning assessments will be graded based on rubric criteria and weighted according to the following break-down.

Weighting	Assessment / Assignment
25%	Weekly Worksheets
40%	Six Take-Home Exams
35%	Labs

**Assignments**

**Weekly Worksheets:** Typically, one per week there will be a reading/lecture posted before class that should be viewed/read before the next class. We will then use the class period on a discussion/activity with an associated assignment to complete and submit to UBLearns before the start of the next class (i.e. the following Monday). I will be dropping the lowest two homework grades at the end of the semester.

**Take-home Exams:** There will be six take-home exams due throughout the semester (Sept. 21<sup>st</sup>, Oct 5<sup>th</sup>, Oct. 19<sup>th</sup>, Nov. 9<sup>th</sup>, Nov. 30<sup>th</sup>, and Dec. 14<sup>th</sup>). Each of these take-home exams will be released two weeks before it is due on UBLearns under the “Assignments → Exams” tab. The sixth exam will be worth twice the amount of points as the preceding exams. The exams will consist of a combination of short answer questions and data analyses on the topics currently being covered in class. You are allowed to use any texts, articles, books, or notes and are encouraged to collaborate with your fellow students, but all work should be in your own words (i.e. no plagiarism). To be clear you are **only** allowed to collaborate with other student enrolled in this class. Soliciting help from individuals not enrolled in class will be considered a violation of academic integrity.

**Labs:** Labs are every week with the following exceptions. There is no Monday section of lab on September 5<sup>th</sup> due to Labor Day and there is no Wednesday section of lab on November 23<sup>rd</sup> due to Fall Recess. There will be an assignment associated with each of the labs. For the field trips this will be your field notebooks but later labs will often take the form of a worksheet. Labs will be due at the start of the following week’s lab but can usually be completed in the allotted lab time. You are expected to attend every lab class and missing more than two labs without explanation is grounds for automatic failure.

**Lab Field Trips:**

The 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> labs will be field trips to local rock outcrops. We will be taking the Geology Department vans to each location. These vans will leave promptly at the start of lab period (i.e. 3PM) to maximize our time spent at the location before returning to campus by the end of the lab period (i.e. 5:30PM). The vans are located on the west side of Cooke Hall, behind Dorsheimer Greenhouse. Unless there are torrential rains, lightning, or some similarly dangerous weather you should assume we will be going on these field trips. You will be advised about the specifics of each site the week before.

**Make-up Policy:**

Assignments for this course are built so that it is possible to complete the assignments outside of class. However, it will be much more difficult to complete the assignments if you are not participating during class time. In cases where students are unable to attend labs contact myself (Dr. Boyle) and Hayley Martinez as soon as possible. It is usually possible to find some satisfactory resolution.

**Academic Integrity:**

Academic integrity is a fundamental university value. Through the honest completion of academic work, students not only advance their educational objectives, they sustain the integrity of the university and facilitate the transmission of knowledge and culture based upon the generation of new and innovative ideas. The [Undergraduate Academic Integrity Policy](#) provides additional information about what UB considers to be academic dishonesty and the possible consequences for violating UB's policies on academic integrity. In particular, you should be sure that you are aware of what UB considers to be academic dishonesty and that you understand how to avoid academic dishonesty. If you are unsure about the meaning of any of this information please talk to me or your academic advisor about them and we will try to clarify our expectations.

**Accessibility Resources:**

If you have any disability which requires reasonable accommodations to enable you to participate in this course, please contact the Office of Accessibility Resources, 25 Capen Hall, 645-2608, and also the instructor of this course. The Office of [Accessibility Resources](#) will provide you with information and review appropriate arrangements for reasonable accommodations.

**Student Wellness:**

As a student you may experience a range of issues that can cause barriers to learning or reduce your ability to participate in daily activities. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, health concerns, or unwanted sexual experiences. Counseling, Health Services, and Health Promotion are here to help with these or other issues you may experience. You [learn can more about these programs and services](#) by contacting:

Counseling Services:	120 Richmond Quad (North Campus), phone 716-645-2720 202 Michael Hall (South Campus), phone: 716-829-5800
Health Services:	Michael Hall (South Campus), phone: 716- 829-3316
Health Promotion:	114 Student Union (North Campus), phone: 716- 645-2837

**If you find yourself struggling with course-related issues, or any other issues regardless of the reason, please don't hesitate to contact me so I can help you resolve the difficulty or direct you to some other resource who can.**

## Lecture Schedule

Dates	Week	Monday	Wednesday	Friday
8/29-9/2	1	A	B	C
9/5-9/9	2	Labor Day	D	E
9/12-9/16	3	F	G	H
9/19-9/23	4	I	J	K
9/26-9/30	5	L	M	N
10/3-10/7	6	O	P	Q
10/10-10/14	7	R	S	T
10/17-10/21	8	U	V	W
10/24-10/28	9	X	Y	Z
10/31-11/4	10	AA	BB	CC
11/7-11/11	11	DD	EE	FF
11/14-11/18	12	GG	HH	II
11/21-11/25	13	JJ	Fall Recess	
11/28-12/2	14	KK	LL	MM
12/5-12/9	15	NN	OO	PP
12/12-12/19	16	Final Exams Week		

Colors correspond to blocks of material covered by each of the six exams. Each of the exams is due the Wednesday after the block of material being tested finishes.

Lecture Topics	
A	Introduction & Expectations
B	Weathering & Erosion
C	Transport & Deposition
D	Characters of Grains
E	Sedimentary Structures
F	Siliciclastic Rocks
G	Carbonate Rocks
H	Biochemical and Evaporite Rocks
I	Deep Time Interpretation of Sed Rocks
J	Eolian & Lacustrine Depositional Environments
K	Glacial Depositional Environments
L	Marginal Marine Depositional Environments I
M	Marginal Marine Depositional Environments II
N	Offshore Marine Depositional Environments
O	Walther's Law, gaps, & time-averaging
P	Transform & Intraplate Basins
Q	Divergent Basins
R	Convergent Basins
S	Sed Cycles & Sequence Stratigraphy
T	Geological Time Scale
U	Litho-, Chrono-, and Chemo-strat

Lecture Topics	
V	Natural Selection & Evolution
W	Species & Biostratigraphy
X	Tempo & Mode
Y	Taphonomy
Z	Turnover in the Fossil Record
AA	Ediacaran Revolution & Cambrian Explosion
BB	Phylogeny
CC	Microfossil Groups
DD	Ecdysozoa I: stem panarthropods
EE	Ecdysozoa II: arthropoda
FF	Spiralians I: lophophorates
GG	Spiralians II: gastropods & bivalves
HH	Spiralians III: cephalopods
II	Ambulacraria
JJ	Early gnathostomes
KK	Tetrapodomorphs
LL	Sauropsida I: back to the oceans
MM	Sauropsida II: crocs & pterosaurs
NN	Sauropsida III: dinosaurs
OO	Synapsida I: stem group
PP	Synapsida II: crown group

## Lab Schedule

<b>Lab #</b>	<b>Lab</b>
1	Introduction to field notes and ID sed rocks
2	Field Trip (Bennett Beach)
3	Field Trip (Cazenovia Creek)
4	Field Trip (Glen Park)
5	Field Trip (Lockport)
6	Sedimentary Rock ID
7	Giese Core Log I
8	Giese Core Log II
9	Mohawk Valley Correlation
10	Cephalopods & trilobites
11	Brachiopods & bivalves
12	Corals & echinoderms
13	Hamilton Fauna I (local taxonomic survey)
14	Hamilton Fauna II (local taxonomic survey)