

## **Sediments and Sedimentary Rocks (ERTH 2203) Fall 2018**

**Instructor:** Dr. Owen Sherwood ([owen.sherwood@dal.ca](mailto:owen.sherwood@dal.ca))  
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**Office Hours:** Wednesday 9:00-11:30 and by appointment  
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**Lectures:** Tuesday and Thursday 10:05 – 11:25; LSC 2055  
**Labs:** Thursday 14:35 – 17:25; LSC 2055

**Course Description:** The course deals with physical, chemical and biological processes that generate modern sediments, and their conversion to sedimentary rocks through time. Labs provide a practical introduction to sediment analysis and to a range of sedimentary structures and rock types. Fieldwork may include description of beaches and bedrock in Nova Scotia.

**Prerequisites:** EARTH 1080 and EARTH 1090 / DISP. This is a required course for EARTH Majors and a prerequisite for EARTH 3303 – Stratigraphy.

**Course Objectives:** By the end of this class students should be able to:

- Identify and explain the nature of sediments and a variety of sedimentary rocks
- Clearly establish the link between understanding modern sediments and their depositional environments and the interpretation of sedimentary rocks and their environments as recorded in the rock record
- Identify the mineralogy of sedimentary rocks and know the most common components of a given sedimentary rock
- Identify possible sedimentary environments of deposition given a particular sediment, sedimentary rock, or sequence of sedimentary rocks
- Identify and interpret sedimentary structures in relation to possible formation and as clues to environments of deposition
- Interpret geologic maps with sedimentary sequences
- Reason and critically think increasingly like a sedimentologist
- Be familiar with professional skills and attributes associated with sedimentology-in-practice

**Text:** Sedimentology and Stratigraphy 2<sup>nd</sup> Edition. Gary Nichols. (Wiley).  
Availability: Dal bookstore (\$123.85 to buy; \$62.02 to rent for semester), online booksellers, and Killam digital.

**Brightspace:** Handouts, assignments, and notes will be posted to Brightspace. Please check regularly and inform the instructor of access issues.

**Organization:** This course consists of two 80 minute lectures and a 3 hour lab each week.

- Lectures will cover fundamental concepts in sedimentology and will include in-class exercises and assignments designed to solidify the lecture material. **Attendance is very important, as I will present material that may not be found in the textbook, and because part of the grading is based on class participation and in-class assignments.** Note that I do not share lecture slides. If you miss a class, ask a classmate if they would be willing to share their notes.
- Labs will provide hands on experience with observing, describing and interpreting sediments and sedimentary rocks. Please bring the following to labs: **pens, pencils, eraser, ruler, hand lens, calculator or laptop.** Lab assignments are due at end of the lab period.

**Course Policies:**

- **Missed mid-term:** (unavoidable) – final exam will count for 45%.
- **Missed in-class activities:** best 80% counted, so no make-up possible.
- **Labs:** lowest lab mark dropped (excluding field trip), so you can miss one lab. Note that you are still responsible for learning the material. It may be possible to make up a lab on your own, depending on the specific lab and materials needed: if possible, the materials will be available in most cases. Late labs will be penalized 10% per day.
- **Final Exam:** the exam is cumulative and incorporates lecture and lab material. The exam date is set by the registrar, and will occur during the period Dec 6-16. Do not make travel arrangements until the schedule is posted as it will not be possible to give you an early exam.
- **Lecture-lab connection:** the material in the lecture and the labs is carefully coordinated to maximize your learning. A lab exam will focus on material identification and problem-solving, similar to problems undertaken in lab sessions.
- **Collaboration with other students** is accepted and even encouraged; however, students must submit *their own* assignments and labs.

**Grading:**

<b>Component</b>	<b>Weight</b>	<b>Date</b>
In-class quizzes and exercises	15%	every class
Midterm Exam:	20%	Oct 25
Labs:	30%	weekly
Lab Exam:	10%	Nov 29
Final Exam:	25%	TBA
Total:	100%	

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

<b>A+</b> (90-100)	<b>B+</b> (77-79)	<b>C+</b> (65-69)	<b>D</b>	(50-54)
<b>A</b> (85-89)	<b>B</b> (73-76)	<b>C</b> (60-64)	<b>F</b>	(<50)
<b>A-</b> (80-84)	<b>B-</b> (70-72)	<b>C-</b> (55-59)		

**Class Schedule:** Note: this schedule is subject to minor revision in the ordering of content; revised versions will be uploaded to Brightspace. Readings TBA.

Week	Day	Lecture	Lab
<b>Unit 1: Formation of Sediments:</b>			
1	4-Sep	1. Introduction, Learning to Learn	
	6-Sep	2. Weathering & Erosion vs. Transport	(no lab)
2	11-Sep	3. Weathering & Formation of Sediments	
	13-Sep	4. Sediment Texture	Lab 1: Clastic rocks
3	18-Sep	5. Sediment Mineralogy	
	20-Sep	6. Controls on Sediment Supply	Lab 2: Clastic textures and textural maturity
4	25-Sep	7. Unit 1 Catch up and review	
<b>Unit 2: Transport and Sedimentary Structures:</b>			
	27-Sep	8. Fluid flow and forces of sediment transport	Lab 3: Self-directed campus field trip
5	2-Oct	9. Hulstrom diagram	
	4-Oct	10. Grain movement and bedforms	Lab 4: Erosional, depositional and diagenetic structures 1
6	9-Oct	11. Cross laminae, ripples and dunes	
	11-Oct	12. Climbing, flaser and upper flow regime	(no Thursday lab)
	13-Oct		Lab 5: Horton Bluff field trip
7	16-Oct	13. Oscillatory and combined flow	
	18-Oct	14. Turbidity currents and graded bedding	Lab 6: Erosional, depositional and diagenetic structures 2
8	23-Oct	15. Other structures; Catch up and review	
<b>Unit 3: Facies and Depositional Environments:</b>			
	25-Oct	16. Facies concepts; Terrestrial and marine	<b>Midterm During Lab</b>
9	30-Oct	17. Clastic coasts and estuaries 1	
	1-Nov	18. Clastic coasts and estuaries 2	Lab 7. Carbonates and other rocks
10	6-Nov	19. Carbonate reefs and banks 1	
	8-Nov	20. Carbonate reefs and banks 2	Lab 8: Carbonate reef facies
11	13-Nov		
	15-Nov		Reading week - no classes or labs
12	20-Nov	21. Alluvial and fluvial systems 1	
	22-Nov	22. Alluvial and fluvial systems 2	Lab 9: Core logging
13	27-Nov	23. Other depositional environments	
	29-Nov	24. Unit 3 Catch up and review	<b>Lab Exam</b>

## University Policies and Statements

**This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate**

### Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

### Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

### Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

**Statement:** <http://www.dal.ca/cultureofrespect.html>

### Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

### Important Dates in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### University Grading Practices

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

### Academic supports

**Library:** <https://libraries.dal.ca/>

**Writing Centre:** [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

### Other supports and services

**Student Health & Wellness Centre:** [https://www.dal.ca/campus\\_life/health-and-wellness/services-support/student-health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html)

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

### Safety

**Research Lab Safety** [https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab\\_policy\\_manual\\_2007.pdf](https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab_policy_manual_2007.pdf)

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>