Sediments and Sedimentary Rocks Syllabus

Department of Earth and Environmental Sciences

ERTH - 2203 Fall 2023

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor(s)

Name	Email	Office Hours
Dr. Wilder Greenman	wilder.greenman@dal.ca	TBD*
Michael Powell	michael.powell@dal.ca	TBD*

*We will select suitable dates for office hours on the first day of class.

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.

Course Prerequisites

ERTH 1080 and ERTH 1090 / DISP. This is a required course for ERTH Majors and a prerequisite for ERTH 3303 – Stratigraphy.

Student Resources

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: 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

Studying for Success: 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.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

Safety

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

Dalhousie COVID-19 information and updates: https://www.dal.ca/covid-19-information-and-updates.html

Course Structure

Course Delivery

Lectures

In-person, Wednesdays and Fridays 2:35 - 3:55pm, room LSC-BIOL&EARTH B8007. Lectures will not be recorded.

Laboratories

In-person, Thursday 2:35 – 5:25pm, room LSC-BIOL&EARTH B2055. Laboratories will not be recorded.

Course Materials

Textbook (*required*):

- Nichols, G. (2009) Sedimentology and Stratigraphy, 2nd Edition. Wiley, paperback, 419 pages; ISBN: 978-1-4051-3592-4. Availability:
    - Online booksellers (*this is best, cheapest option*)
    - Sexton Library *QE 571 N53 2009*. Unfortunately, the publisher of *Nichols* is no longer offering e-book purchasing for libraries and therefore a digital version is not available there.
    - Note: the textbook is not available through the Dal bookstore as you can generally find it for cheaper online.

Other useful texts (optional):

- Walker, R.G. & James, N.P (1992) *Facies Models: Response to Sea Level Change*. QE 651 F25 1992.
- Boggs, S. (2012) *Principles of Sedimentology and Stratigraphy*. QE 571 B66 2012.
- Prothero, D. & Schwab, F.L. (2013) *Sedimentary Geology: An Introduction to Sedimentary Rocks and Stratigraphy*. QE 571 P77 2013.

Relevant peer-reviewed journals (optional):

- Sedimentology
- Sedimentary Geology
- Journal of Sedimentary Research

Course Software:

- The ERTH2203 Brightspace site will be the primary source for course announcements, quizzes, handouts/readings, and lab assignments. Please check the site regularly and inform the instructor of access or technology issues.

- One-on-one help by appointment will be delivered in person or through Microsoft Teams (outside of Brightspace). Teams is available via the Sharepoint Application Launcher (top left button on the *MyDal* home page).
- Microsoft Excel will be required for some lab assignments. The software is available for free here: https://software.library.dal.ca/index.php

Assessment

Component (number)	Weight (% of final grade)	Date*	Course Policy Note
Quizzes and exercises (20)	15%	Weekly	1
Lab/field assignments (10)	40%	Weekly	2,3,4,5,6
Midterm exam (1)	20%	TBA (1.5 hours)	6,7,8
Final exam (1)	25%	TBA (3 hours)	6,9,10

***** A detailed class schedule will be posted to Brightspace before the first day of class

Course Policies

1. **Quizzes and exercises** will be held and will be due in class, unless otherwise noted.
2. **Lab assignments** will be due one week from the date of the lab session (i.e., the following Thursday, by 2:35pm Halifax Time); late assignments will be penalized 10% per day and will not be accepted after 2:35pm Halifax Time on the Wednesday of the following week.
3. **Assignments resubmitted** after the deadline because "I submitted the wrong file" will be penalized as late. Please ensure that the assignment you submit is the one you intend to submit.
4. **Missed lab assignments**: The lowest of the 10 lab assignment marks will be dropped, so you can miss one assignment without penalty. Additional missed assignments will be graded as zero *unless accompanied by a Student Declaration of Absence for each of the missed assignment(s),* in which case the lab components of the final course grade will be reweighted. Note that you are still responsible for learning the material, as it will be tested on the midterm and final exams.
5. **Collaboration with other students** on lab assignments is accepted and encouraged; however, students must submit *their own* assignments. Assignments with highly similar structure and answers may be submitted to the faculty academic integrity officer for review.
6. **Plagiarism/ChatGPT recognition software** may be used for long-format questions in lab assignments and exams.
7. **Midterm exam:** dates will be posted with the class schedule during the first week of class.
8. **Missed midterm** exam due to exceptional circumstances: final exam will count for 45% of final grade. *Notification must be given to instructor prior to start of exam*.
9. **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. 8-19.

10. **Missed final exam** due to exceptional circumstances: reasonable accommodation (makeup exam or grade reweighting) will be granted. *Notification must be given to instructor prior to start of exam*.

Notes on the learning experience for the Fall 2023 Term

- Lectures will cover fundamental concepts in sedimentology and will include in-class exercises and assignments designed to solidify the lecture material. Attendance is mandatory, as we will cover material that may not be found in the textbook, and because part of the grading is based on in-class quizzes and exercises.
- Lecture slides will be posted online and will generally be posted before the scheduled lecture time.
- 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, and laptop.**
- Field trips: there will be one full day field trip to the Horton Bluff outcrop in October (date TBA). There will also be 1-2 shorter field trips to local sites that will take place during regular lab hours.
- During the pandemic, great effort was put into developing virtual learning materials. Even with the return to in-person instruction these resources can augment your learning experience, so please make use of them. Here are some examples:
    - In *SketchFab*, you can preview material developed by our department's very own Mike Young by searching "GeoScotia". Try loading the Horton Bluff model and this *gutter cast* with tetrapod footprints and explore the panning, rotating and zooming functions. Note: the models can take a while to load – please be patient!
    - Gigapan is for higher resolution (1 cm-scale) panorama imagery, like this view at Horton Bluff.
    - Gigamacro is for (mostly) hand-sample and microscope-scale imagery, like this photo of cored sediments that enables seeing the whole core to the resolution of individual grains.

Conversion of numerical grades to final letter grades follows the
Dalhousie Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Learning Objectives

- 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 like a sedimentologist.
- Develop professional skills and attributes associated with sedimentology-in-practice.

University Policies and Statements

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 at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: https://www.dal.ca/about-dal/internationalization.html

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to

demonstrate these values in all 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. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

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 (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: http://www.dal.ca/cultureofrespect.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. The full Code of Student Conduct can be found at:

https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at:
https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.