

ERTH 2314 - Sedimentation and Stratigraphy

Classes for this course will be in-person for both lectures and labs. There is no online component to the course.

This course examines the origins, transport, and deposition of sedimentary grains, and how sediment layering reflects larger scale processes (tectonics, eustasy, and sediment supply) related to development of the Earth's surface through time. The second topic forms the basis of stratigraphy, the foundation of our understanding of geologic time, and the tool used at all scales (nano-scale to hemispheric) to predict micro- to hemispheric earth patterns (igneous, metamorphic, sedimentary).

Course Description:

Origin of sediments and their transport, distribution, and primary structures; processes of sediment-to-rock transformation; spatial patterns; controls of stratigraphy; methods of correlation.

Includes: Experiential Learning Activity

Precludes additional credit for [ERTH 2318](#).

Prerequisite(s): [ERTH 1006](#) and ([ERTH 1009](#) or [GEOG 2013](#)).

Lectures three hours a week and a laboratory three hours a week.

Times and Location:

Lectures: to be held in-person in Room 3120HP and delivered in-person 1:00-2:30 Mondays and Wednesdays.

Laboratories: 8:30-11:30 Monday. To be held in-person in rooms 2120 HP and 2130 HP. I will discuss details in the introductory lecture.

Schedule of Topics to be Covered: TBA and posted on BrightSpace

People:

- *Instructor:* Dr. Chris Rogers
 - Office hours: TBA or by appointment.
 - Please make every effort to schedule an appointment, I am in a communal office otherwise would have an open-door policy
 - Email: chris.rogers@carleton.ca
 - For privacy reasons I only respond to emails sent through the Carleton University email system. *No Gmail, Hotmail etc*

- *Teaching assistants:* TBA
 - Office hours: TBA

Learning Outcomes:

COURSE LEARNING OBJECTIVES are intended to achieve the following

- develop **memory** of sedimentary geological concepts and attributes
- **understand** concepts of sedimentation
- **apply** concepts through practical demonstration
- learning to **evaluate** datasets

By the end of the semester, each successful student will acquire the following skills and knowledge sets in the lecture and laboratory sessions:

- Illustrating both understanding and capacity to examine, describe, and identify common sedimentary rocks, grain-size distributions, and sedimentary bedforms.
- Illustrating both understanding and capacity to explain, the origin of sediment, sedimentary bedforms, and stratification as products of environmental controls.
- Learning to infer temporal and lateral changes in environment through spatial juxtaposition and superposition of sedimentary facies.
- Learning to infer sea-level change as a product of tectonics, eustasy, and sediment supply from sedimentary patterns in stratigraphic successions.
- Connecting sedimentary geology to resources potential, and impact for society
- Learning and demonstrating how to communicate the above understanding and capacity in written and verbal form to peers and instructors.

The Instructor's expectations:

You will complete all necessary pre-lecture and/or pre-lab readings, assignments, tutorials that you will bring your understanding of basic geological concepts (plate tectonics, general rock type definitions, evolution, hydrology) from EARTH 1000-level courses into use to help understand 2000-level instruction that you will undertake active learning in both lecture and lab environments

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Schedule of Course Topics: TBA

- Sedimentology
- Standard methods
- Sedimentary database
- Deconstructing a sedimentary section
- Siliciclastic rock classification and significance
- Carbonate/evaporite classifications and significance
- Other rocks and facies concepts - environmental criteria
- Siliciclastic facies models
- Interpretation of siliciclastic facies patterns
- Carbonate/evaporite facies models
- Dolostones a case of hydrology
- Interpreting carbonate facies patterns
- Sequence Stratigraphy developing the model and facies patterns

Textbooks:

- *Mandatory:*
 - *Articles to be posted to Brightspace*
- *Recommended:*
 - *Lecture Recommended Reading: Miall, A.D. (2015) Stratigraphy. Springer (Switzerland)*

- *Laboratory Recommended Reading: Sedimentary Rocks in the Field: Dorrik A.V. Stow (2005) A Color Guide Paperback Gulf Professional Publishing*

Course Resources:

This document is available on BrightSpace as are many others relevant to the course. Frequently, visit the homepage of this course for updates with respect to the course plan. The course plan contains information on lecture and laboratory topics, reading assignments, homework, and pre-lecture as well as pre-lab preparations. Note that this course plan may alter during the term. The course website contains most of the laboratory assignments and homework, and you will have to print and read them carefully before the respective labs and lectures. Lecture notes will be made available the Sunday before the lectures and updated after each lecture as necessary.

Required Readings:

1. Selected readings

The best textbook does not have an online version. Thus, readings are assigned as pre-lecture or pre-lab assignments, meaning that you need to read them before the lecture, after the lecture go back over the readings to pick up on ideas / concepts that you may have missed.

2. Laboratory Reference Manual (from the BrightSpace website; there is no need to print this out – it may remain as online version, but you can print it out if you need to; it is 40-50 pages in length so taking it to Staples would be economical)

Lecture/Lab resources:

1. Website (BrightSpace)

The website provides access to lecture/lab schedule, lab assignments, lab reference manual. Lecture readings are defined for each week. Lecture slides are posted. All lab assignments are accessed through the website; will need to be downloaded and printed.

Review an upcoming week's lecture and lab requirements well before the lecture/lab periods so that you complete pre-lecture or pre-lab readings.

2. Sedimentary toolkit

Despite remote learning, you should assemble the following for the lab:

- hand lens*
- grain-size comparator card*
- coloured pencils,
- normal pencil, and

- a scale (in mm/cm)

* available from Science Stores (Steacie Building)

Course requirements:

All lectures and laboratories will be in person. You are expected to attend all lectures and laboratories, in-person. All laboratory exercises are due at the end of the lab period and there may not be an opportunity to make up missed labs.

Missed Examinations and Assignments:

Students with conflicts for any examination must have a note from an employer or a sports coach in order to write the exam at another date. Unless caused by illness, all conflicts MUST be reported to the instructor PRIOR to the exam date. If a lab is missed, a student may make it up the following week outside normal lab time. In the case of a less serious illness (COVID, cold, flu), I require that you inform me by e-mail immediately, and we will schedule a deferred exam as soon as possible. In the case of a serious illness, see <http://carleton.ca/registrar/special-requests/deferral/> for the rules concerning deferral of an exam or assignment, and contact me as soon as possible.

Grading:

Academic assessments are shown as a % of your final mark:

Tests (lecture-based)

Test #1	5 %	
Test #2	10 %	
Test #3	20 %	December formal exam period

Tests (lab-based)

Lab exam #1	10 %	
Lab exam #2	15 %	
Laboratory assignments	15 %	due weekly
Written assignments	10 %	as defined on BrightSpace
Class participation	10 %	Daily lecture attendance/quiz questions
CSAS Program	5%	(Center for Student Academic Support)

The lab component of the course must be passed in order to pass the course. All late assignments will be penalized 15% per day for a maximum of 3 days, after which assignments will not be accepted.

Class Participation and In-Class Quizzes

PollEverywhere will be used to incorporate interactive elements into the lectures. These elements will be graded and count toward either specific quizzes marks or the general participation marks. You will be provided with details on how to register with

PollEverywhere. You must register with your Carleton email using the FirstnameLastname@cmail.carleton.ca format to get credit for your participation.

Center for Student Academic Support Incentive Program Information

This course has been registered in the Incentive Program offered through the Centre for Student Academic Support (CSAS). The Incentive Program is now fully online! CSAS Learning and Writing Support Workshops are designed to help students cultivate and refine their academic skills for a university environment. To earn 5% towards attendance/participation, students are expected to complete 3 workshops, 1 Mandatory (Introduction to Starting Academic Papers) and two others throughout the term.

*****Mandatory Workshop, Introduction to Starting Academic Papers, must be completed before September 16th***.**

All workshops must be completed, and completion certificate uploaded to Brightspace by December 9th to receive credit for the Incentive Program.

Please ensure that you complete the workshops by your course-specific deadline. For students' attendance to be captured, they must complete all workshop components and achieve 100% on the final assessment. Once students achieve 100% on the final assessment, they will receive a Record of Completion award from Brightspace. Students will need to download the Record of Completion PDF for each applicable workshop and submit them to the assignment submission box within their instructor's course. For more information about workshop attendance and submitting the Records of Completion, please visit the Incentive Program Policies on our website.

To view the complete list of the workshops and their descriptions, please visit the Learning and Writing Support Workshops page on the CSAS website (<https://carleton.ca/csas/incentive-program/>).

Please note that CSAS webinars and in-person workshops are not eligible for the Incentive Program.

For complete workshop descriptions please visit the CSAS website:

<https://carleton.ca/csas/learning-support/learning-support-workshops/>

To access the online workshops, please self-enroll through the CSAS Online Learning Community: <https://carleton.ca/csas/online-support/>

For additional questions, please contact the Centre for Student Academic Support at csas@carleton.ca.

Written Assignments: (=10 % of final mark)

Four assignments are offered to help you begin the process of learning to express your observations in writing. The first asks you to summarize why are you in the EARTH program. On the basis of different laboratory assignments, the next three help you to learn how to summarize depositional histories of stratigraphic successions based on rock types and sedimentary structures. Details of subject material for assignments #2-4 are provided in the lab one or two weeks prior to the assignment's due date.

Each assignment represents a minor component of the final grade but may be instrumental in pushing your final mark across a grade boundary.

Purpose

There are two roles for these assignments: the first is to get you into practice of linking observations, then drawing interpretations based on concepts learned in the lab / lecture; the second is to get you into the practice of organizing your thoughts into coherent written expression.

Format and a rubric are found on the website under Written Assignments

Late assignments are not accepted unless medical/personal exceptions are documented according to University regulations. For medical exemptions please fill out <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>

Student Illness

A student who falls ill during a lab or workshop will be asked to go home immediately and self-isolate, and to complete the Carleton COVID-19 symptom reporting web tool. If a TA, instructor, or other staff member becomes ill, then their supervisor/manger must be informed.

If the student is incapacitated, then Campus Safety (ext. 4444) must be contacted. The student should be kept at least 2m from other people in the room until help arrives.

Academic Integrity at Carleton

Carleton University demands academic integrity from all its members. It is your responsibility to review Carleton's policy on Academic Integrity. The Academic Integrity Policy (<http://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf>) governs the academic behaviour of students. Academic Integrity is defined as:

“A commitment even in the face of adversity to five fundamental values: honesty, trust, fairness, respect, and responsibility.” – Centre for Academic Integrity (1999)

Academic dishonesty, in whatever form, is destructive to the values of the university, and risks harming the university's reputation as place of learning and innovation. Furthermore, it is unfair and discouraging to those students who pursue their studies honestly.

Process

The Academic Integrity Policy is implemented at the faculty level across the university. Appeals of the Academic Integrity Policy are administered by the Director, Student Affairs.

Step 1: Instructor believes misconduct has occurred

Step 2: Faculty Dean reviews documentation

Step 3: Student is contacted by email and letter

Step 4: Meeting with student, Dean and Advisor

Step 5: Dean informs student of decision

Appeal: Student has the right to appeal the decision

Examples of Violations

The following list includes, but is not limited to, examples of violations under the Academic Integrity policy. Please refer to the full Academic Integrity Policy (PDF) for more information.

Plagiarism:

The instructor is required to report all incidents (or suspected incidents) of plagiarism to the Dean. All work handed in must be your own work. The Policy is strictly enforced and is binding on all students.

Examples include:

- Submitting work written in whole or in part by someone else
- Failing to acknowledge sources through the use of proper citations when using another's work
- Test and Exam Rules:
- Attempting to read another student's exam paper
- Speaking to another student (even if subject matter is irrelevant to text)
- Using material not authorized by the examiner

Other Violations:

- Improper access to confidential information such as exams or test questions
- Disruption of classroom activities or periods of instruction
- Misrepresentation of facts for any academic purpose

Examples of Sanctions

The following list includes, but is not limited to, a few examples of sanctions that may be used independently or in combination, depending on the details of the academic integrity violation. Repeat or multiple violations will increase the sanction. Refer to the Academic Integrity Policy (PDF) for more information.

- A grade of zero, a failure or a reduced grade for the piece of academic work
- Reduction of final grade in the course
- Completion of a remediation process
- Resubmission of academic work
- Withdrawal from course(s)
- Suspension from a program of study
- A letter of reprimand

Academic Accommodations

Carleton University is committed to providing access to the educational experience in order to promote academic accessibility for all individuals.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

Religious Obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:

carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

For more information on academic accommodation, please contact the departmental administrator or visit: *students.carleton.ca/course-outline*

Pregnancy Obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website:

carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

For more information on academic accommodation, please contact the departmental administrator or visit: *students.carleton.ca/course-outline*

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: *carleton.ca/sexual-violence-support*

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf For more information on academic accommodation, please contact the

departmental administrator or visit: *students.carleton.ca/course-outline*