# Sedimentation and Stratigraphy (Sedimentary Geology)

## ERTH 2314 (2024 Fall)

**Course Instructor:** Peter Crockford

I am an Assistant Professor in the Dept. of Earth Science

**Gender Pronouns:** (he him his)

**Email: petercrockford@cunet.carleton.ca**

Note: If you have or question or would like to talk with me, you can send an email, visit me during student hours (see below), or approach me after lecture.

**Student Hours:** Tuesday 1:30 pm-2:30 pm

**What are 'Student Hours'?**
*Student hours are dedicated times through the week for the course instructor and TAs to meet with YOU. Pop in to introduce yourself, ask questions about the course, or discuss content from the course.*

*Note: If these If these times don't work for you, email me and we can arrange an alternate time to meet on Monday or Tuesday.*

**Office Location:** Room 2203, Herzberg

**Class Location:** 3120 Herzberg

**Lab Location:** 2120 Herzberg

**Class Times:** Tuesday 9:35 am - 11:25 am

**Lab Times:** 12:35 pm - 2:25 pm

***While the weather is nice some labs will be outside from 9:35 am to 2:25 pm

**Field Trip:** September 21st (Saturday) all day

**Prerequisites:** ERTH 1006 and ERTH 1009

**Department/Unit:** Earth Science

**Course TAs:**

**Olivia King** (she/her/hers) Hear my name
(oliviaking3@cmail.carleton.ca)

**Elizabeth Sullivan** (she/her/hers) Hear my name
(elizabethsullivan3@cmail.carleton.ca)

Hear my name

# Welcome to this Course!

**This course is aimed at giving you an overview of key concepts, processes, and nomenclature to understand the sedimentary rocks which cover the majority of Earth's surface. This understanding sets the foundation for you to explore Earth's past, by showing how the rock record can be used to determine the history of life on Earth, as well as dramatic shifts in Earth's climate over geologic time. You will gain an understanding of this topic through immersive laboratory exercises, field trips, lectures, and assignments.**

**Here is what myself and my teaching team (Olivia and Elizabeth) hope you will gain from this course (learning objectives):**

1. – Learn how to describe sedimentary rocks in hand sample and thin section
2. – Learn how sedimentary observations can be used to understand past environments
3. – Gain a quantitative understanding of processes which lead to the formation of sedimentary rocks
4. – Gain an understanding of how the Geologic Timescale is built as well as it's current level of uncertainty
5. – Learn about the local geology of the Ottawa region

**Sedimentary Geology is for everyone! And so we aim to foster an environment of inclusive teaching:**

"We are committed to fostering an environment for learning that is inclusive for everyone regardless of gender identity, gender expression, sex, sexual orientation, race, ethnicity, ability, age, class, etc.–All students in the class, the instructor, and any guests should be treated with respect during all interactions. It is my hope that our class will support diversity of experience, thought, and perspective. I will continually strive to create inclusive learning environments and would therefore appreciate your support and feedback."

## Community Guidelines

The following values are fundamental to academic integrity and are adapted from the International Center for Academic Integrity*. In our course, we will seek to behave with these values in mind:

| | As students, we will… | As a teaching team, we will… |
|---|---|---|
| **Honesty** | • Honestly demonstrate our knowledge and abilities on assignments and exams<br>• Communicate openly without using deception, including citing appropriate sources | • Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams<br>• Communicate openly and honestly about the expectations and standards of the course through the syllabus, and with respect to assignments and exams |
| **Responsibility** | • Complete assignments on time and in full preparation for class<br>• Show up to class on time, and be mentally/physically present<br>• Participate fully and contribute to team learning and activities | • Give you timely feedback on your assignments and exams<br>• Show up to class on time, and be mentally & physically present<br>• Create relevant assessments and class activities |
| **Respect** | • Speak openly with one another, while respecting diverse viewpoints and perspectives<br>• Provide sufficient space for others to voice their ideas | • Respect your perspectives even while we challenge you to think more deeply and critically<br>• Help facilitate respectful exchange of ideas |
| **Fairness** | • Contribute fully and equally to collaborative work, so that we are not freeloading off of others<br>• Not seek unfair advantage over fellow students in the course | • Create fair assignments and exams, and grade them in a fair, and timely manner<br>• Treat all students equitably |
| **Trust** | • Not engage in personal affairs while on class time<br>• Be open and transparent about what we are doing in class<br>• Not distribute course materials to others without authorization | • Be available to all students when we say we will be<br>• Follow through on our promises<br>• Not modify the expectations or standards without communicating with everyone in the course |
| **Courage** | • Say or do something when we see actions that undermine any of the above values<br>• Accept a lower or failing grade or other consequences of upholding and protecting the above values | • Say or do something when we see actions that undermine any of the above values<br>• Accept the consequences (e.g., lower teaching evaluations) of upholding and protecting the above values |

* This class statement of values is adapted from Tricia Bertram Gallant, Ph.D.

## Online Community Expectations for Social Platforms

With the growing use of social platforms (e.g., Discord) on campuses, it is important to keep in mind that university codes of conduct still apply to the behaviours of students online. Please be considerate and respectful while engaging with peers and remember that we are all humans, and that your words matter. If any student witnesses or experiences harassment, I encourage you to reach out to me. Alternatively, you can contact Ombuds Services or Carleton Equity and Inclusive Communities.

Online communities can be highly beneficial to you and can help to facilitate learning within the course. I encourage people to ask questions, learn from one another, and have open discussions about class material. That said, any acts of academic misconduct (i.e., cheating) will not be tolerated and will result in serious consequences ranging from a **grade reduction to expulsion** (*see academic integrity violations*).

- Examples of appropriate peer-to-peer sharing/learning vary from course to course. In this course appropriate peer-to-peer sharing includes: identifying the proper formula to use, identifying an incorrect or missing step in a person's work, brainstorming potential reasons behind a concept, suggesting helpful sites and videos for learning a concept, posting your own work showing only a specific step or process for illustrative purposes (note: this is very different from posting your work and solution for others to simply copy)
- Examples of unacceptable peer-to-peer sharing: Posting or sharing the answers, indicating which answers are correct on assignments, sharing links to solutions, posting your own complete work for a question/solution
- **If a violation is found (e.g., plagiarism, copying another students assignment etc.) this will be reported and administered through the Dean's office. Consequences can include a grade of F in the course, or even expulsion from your academic program.**

## Learning Materials

**Textbook:** There is no textbook for this course. I will assign some readings and provide pdfs in class. However, for those who wish to gain a deeper understanding of the material covered I recommend the following books:

Knoll, Andy (2021). A Brief History of Earth: Four Billion Years in Eight Chapters, 2021.
*This is a book written for a general audience but it gives a fantastic overview of Earth's past.*

Prothero, Donald. Sedimentary Geology

*This book will provide a broad overview of sedimentary geology*

**Technology Checklist:**

- An internet-enabled computer (laptop/desktop)
- Zoom software installed on computer (can also install on phone as backup!)
- Access to reliable internet
- Webcam

*Note: From time to time, you will need an internet enabled device in class. If this is not possible for you to bring, we will be working in groups and as long as someone has a phone or laptop there will be no problem. Also, one of your assignments will require you to record a presentation and for you to watch other students' presentations outside of class.*

## Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why I have high standards in this course. I am confident that, with appropriate effort, you **all** can meet those standards.

I will also make an effort to reduce unintentional bias in grading by using methods such as grading assignments one question at a time (i.e., grading all of question 1 before grading any of question 2), grading anonymously, and using rubrics.

## Grade Breakdown

| COMPONENT | GRADE VALUE |
|---|---|
| **KNOWLEDGE CHECKS** | 12% (7 checks, 2% each, 6/7 will be counted) |
| **ASSIGNMENT 1** | 6% |
| **ASSIGNMENT 2** | 12% |
| **MIDTERM 1** | 19% |
| **MIDTERM 2** | 19% |
| **LABS** | 32% (Lab 1 = 11%, Labs 2-8 = 3%) |
| **FINAL EXAM** | There is no exam! |
| **EXTRA CREDIT** | 3% |

## Knowledge Checks

It is very important for me to know whether you are all grasping the course material. Therefore, there are 7 Knowledge Checks in the course. These will be presented throughout the course in class at a time of my choosing. Topics may include assigned readings, concepts raised in lab or in lecture. For each knowledge check you will be presented with 1-5 questions. Only your best **6** will be used to tabulate your total mark in the course. If you miss a knowledge check, don't worry, it won't hurt your grade. However, there will be no redo's for these, and everyone is expected to complete these in the assigned allotment of time.

## Assignments

There are 2 assignments in this course. Full assignment descriptions and marking rubrics are posted on Brightspace (include link here for students to locate descriptions/rubrics easily).

| ASSIGNMENT | GRADE VALUE | TOPIC | DUE |
|---|---|---|---|
| **1** | 6% | -- | Sept 24 |
| **2** | 12% | -- | Nov 5 |

**Late Assignment Penalties:**

Late assignments will lose 10% per day (1 grade point value). An assignment can no longer be submitted 9 days following its initial deadline.

## Midterm Exams

Both midterms will take place online. They will be available to access for **48 hours**, posed on Brightspace, during the dates posted below. Choose a time to complete the exam that works best for you, bearing in mind that if that time is the middle of the night eastern standard time, that you may have to wait for responses to questions or technical difficulties. Once you access the midterm you will have **80 mins** to complete it. The midterm will consist of multiple choice, short answer and problem-solving questions like the ones that we have practiced in the course.

| MIDTERM | GRADE VALUE | TOPIC | DATE |
|---|---|---|---|
| **1** | 12.5% | -- | Oct 15 |
| **2** | 12.5% | -- | Dec 3 |

Looking for help preparing for midterms? Student Academic Success Services (SASS) at Carleton offers course-targeted study groups and supports and the Science Student Success Centre (SSSC) provides help with study skills.

**Note, in the case of grade disputes on mid-terms, the following protocol will occur. 1. You will make myself, Olivia or Elizabeth aware of an issue with your grading. 2. If you convince us that two questions have been significantly mis-graded you will have the choice to have your entire test regraded. 3. Your new mark will be what is locked in, even if it is lower than your first mark.**

Why do we do this?

**Errors can be made from time to time both in the awarding and subtracting of marks on a mid-term. Therefore it is unfair to all students if only those who dispute their marks receive all of the incorrect awarding of grades and do not receive any incorrect subtractions.**

## Field Trip – Saturday September 21st

Every student is expected to attend this field trip on Saturday September 21$^{st}$. This trip will be co-run by Emeritus Professor George Dix. We will begin our day with an overview of the geology of the Ottawa region followed by traveling to various points of interest around the Ottawa area which showcase the exciting geologic history of the Ottawa Region.
**Attendees will receive 3% extra credit. Required gear: Hat, Rain coat, lunch/snacks, water, safety glasses, high-vis vest, note book, pencil, comfortable shoes.**

## Absences, Delays, Feeling Sick?

If you feel very sick (e.g., fever, chills, stomach upset) do not come to class or campus. Our teaching team will do our very best to accommodate all absences. **However, accommodation forms will not be accepted in this class and instances will be evaluated on a case by case basis.**

## Mental Health

If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! Email me and we will set a time to meet. I'll work with you, I promise. Remember that Carleton also offers an array of mental health and well-being resources, which can be found here.

## University Policies

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

| | | | |
|---|---|---|---|
| A+ = 90-100 | B+ = 77-79 | C+ = 67-69 | D+ = 57-59 |
| A = 85-89 | B = 73-76 | C = 63-66 | D = 53-56 |
| A- = 80-84 | B- = 70-72 | C- = 60-62 | D- = 50-52 |

F = <50
WDN = Withdrawn from the course

DEF = Deferred

## Academic Accommodations, Regulations, Plagiarism, Etc.

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. More information can be found at: https://students.carleton.ca/course-outline/

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/

## Academic Accommodations for 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. For more details, visit the Paul Menton Centre website.

## Addressing Human Rights Concerns

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the Department of Equity and Inclusive Communities at equity@carleton.ca.

## Religious Obligations

Please contact me with 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, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

## 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 where 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: https://carleton.ca/sexual-violence-support/

## For Pregnancy

Please contact me 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, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

## 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 me 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, see the Senate Policy on Accommodation for Student Activities (PDF, 25KB).

## Academic Integrity

Academic Integrity is upholding the values of honesty, trust, respect, fairness, responsibility, and courage that are fundamental to the educational experience. Carleton University provides supports such as academic integrity workshops to ensure, as far as possible, that all students understand the norms and standards of academic integrity that we expect you to uphold. Your teaching team has a responsibility to ensure that their application of the Academic Integrity Policy upholds the university's collective commitments to fairness, equity, and integrity.
(Adapted from Carleton University's Academic Integrity Policy, 2021).

**Examples of actions that do not adhere to Carleton's Academic Integrity Policy include:**

- Plagiarism
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Using artificial intelligence tools such as ChatGPT when your assessment instructions say that it is not permitted

Please review the checklist linked here to ensure you understand your responsibilities as a student with respect to academic integrity and this course.

## Sanctions for Not Abiding by Carleton's Academic Integrity Policy

A student who has not upheld their responsibilities under Carleton's Academic Integrity Policy may be subject to one of several sanctions. A list of standard sanctions in science can be found here.

Additional details about this process can be found on the Faculty of Science Academic Integrity website. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy. The Policy is strictly enforced and is binding on all students.

## Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the 7 Rights and Responsibilities Policy for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

## Student Concerns

If a concern arises regarding this course, **your first point of contact is me**: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):




**Note:** You can also bring your concerns to Ombuds services.

## Assistance for Students

Academic and Career Development Services: http://carleton.ca/sacds/

Writing Services: http://www.carleton.ca/csas/writing-services/

Peer Assisted Study Sessions (PASS): https://carleton.ca/csas/group-support/pass/

Math Tutorial Centre: https://carleton.ca/math/math-tutorial-centre/

Science Student Success Centre: https://sssc.carleton.ca/

| Chapter | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| **September** | | | | | |
| **No Class** | 2 | 3 | 4 | 5 | 6 |
| **Week 1** | 9 | **10** | 11 | 12 | 13 |
| **Week 2** | 16 | ***L1; A1 assigned*** **17** | 18 | 19 | 20 |
| **Week 3** | 23 | ***L1; Q1; A1 due 11:59pm*** **24** | 25 | 26 | 27 |
| **October** | | | | | |
| **Week 4** | 30 | ***L1; Q2*** **1** | 2 | 3 | 4 |
| **Week 5** | 7 | ***L2; Q3*** **8** | 9 | 10 | 11 |
| **Week 6** | 14 | ***L3; M1; A2 assigned*** **15** | 16 | 17 | 18 |
| **No Class** | *Fall Break* 21 | *Fall Break* 22 | *Fall Break* 23 | *Fall Break* 24 | *Fall Break* 25 |
| **November** | | | | | |
| **Week 7** | 28 | ***L4*** **29** | 30 | 31 | 1 |
| **Week 8** | 4 | ***L5; Q4; A2 due in class*** **5** | 6 | 7 | 8 |
| **Week 9** | 11 | ***L6; Q5*** **12** | 13 | 14 | 15 |
| **Week 10** | 18 | ***L7; Q6*** **19** | 20 | 21 | 22 |
| **Week 11** | 25 | ***L8; Q7*** **26** | 27 | 28 | 29 |
| **December** | | | | | |
| **Week 12** | 2 | ***M2*** **3** | ***Class is finished!*** | | |

L = Lab; Q = Knowledge Check; A = Assignment; M = Midterm F = Field Trip