EESB20H3 S

Sedimentology and Stratigraphy

Winter 2024 Syllabus

## Course Meetings

### EESB20H3 S

| **Section** | **Day & Time** | **Delivery Mode & Location** |
| --- | --- | --- |
| **LEC01** | Tuesday, 1:00 PM - 3:00 PM | In Person: HW 408 |
| **PRA0001** | Wednesday, 11:00 AM - 1:00 PM | In Person: EV 224 |
| **PRA0002** | Wednesday, 11:00 AM - 1:00 PM | In Person: EV 222 |

Refer to ACORN for the most up-to-date information about the location of the course meetings.

## Course Contacts

**Course Website:** <https://q.utoronto.ca/courses/333217>

**Teaching Assistant:** Lavanecha Chandran

**Email:** [lavanecha.chandran@mail.utoronto.ca](mailto:lavanecha.chandran@mail.utoronto.ca)

**Office Hours and Location:** See Quercus homepage for updates

**Instructor:** Dr. Kirsten Kennedy

**Email:** [kirsten.kennedy@mail.utoronto.ca](mailto:kirsten.kennedy@mail.utoronto.ca)

**Office Hours and Location:** By Appointment. See Quercus home page for updates.

## Course Overview

Sedimentary basins hold the bulk of Earth’s rock record and are fundamental in the study of past environments, tectonic evolution, climates, and biosphere. This course will explore different basin types and the nature of their infills. The course will also emphasize the economic resources within sedimentary basins and paleoenvironmental significance.

**Overview:**

Geology is the study of the earth. Though only 5% of the Earth’s crust is comprised of sedimentary rock, they cover 70-75% of the exposed surface. About 90% of the Earth’s surface is mantled by unlithified sediment. Sediments and sedimentary rocks are therefore the most common Earth material that you will come into contact with on a regular basis if you pursue a career in any type of geoscience. Sedimentology is a foundational branch of geology that focuses on sediment, sedimentary rocks, and the processes involved in their formation, deposition, and alteration over time. Stratigraphy is a branch of geology that focuses on the arrangement of ‘layers’ in the Earth’s crust.

Because they form and interact with Earth’s surface, sediments and sedimentary rocks are extremely important. They house many economically important minerals, as well as coal and petroleum. The record of Earth’s Environment through deep time is largely held within sedimentary rocks. Sedimentologists contribute significantly to problems in environmental management and hazard assessment by understanding Earth surface processes.

During this course, we will cover basic principles in sediment and sedimentary rock classifications based on composition and texture, sediment transport, interpretation of primary and secondary sedimentary structures, and the process of lithification (turning into rock).  After covering the basic principles, we will turn our focus to the interpretation of ancient and recent sedimentary rock formations regarding their depositional environments (facies analysis). Furthermore, we will discuss the application and principles of sequence stratigraphy and what information we can gain about local and global sea level changes. The gained knowledge will then be used for an integrated analysis and interpretation of the depositional processes in southern Ontario during Paleozoic times.

### Course Learning Outcomes

By the end of the course students should have a thorough understanding of depositional processes, the environments in which they operate and the sedimentary record they produce.  Students will also develop skills in the following areas:

* Problem solving and data analysis
* Laboratory methods for textural analysis of sediments and core samples
* Classification and identification of the various sedimentary rocks
* Field description and logging sediments and sedimentary rocks (weather permitting)
* Interpretation of sedimentary facies and structures
* Lab report writing

**Prerequisites**: EESB15H3

**Corequisites**: None

**Exclusions:** ESS331H, ESS332H, ERS313H

**Recommended Preparation**: None

**Credit Value:** 0.5

## Course Materials

There is no required textbook for this course. However, the following are available in the course reserve for supplementary reading:

* Sedimentology and Stratigraphy, G. Nichols, 2009, Wiley
* Principles of Sedimentology and Stratigraphy, S. Boggs, latest edition, Prentice Hall
* Sedimentary Geology, An Introduction to Sedimentary Rocks and Stratigraphy, Prothero & Schwab, Freeman
* Facies Model 4, N.P. James & R.W. Dalrymple, 2010, Geological Assoc. of Canada

## Marking Scheme

| **Assessment** | **Percent** | **Details** | **Due Date** |
| --- | --- | --- | --- |
| **Midterm** | 15% | 1 hr 45 minutes long, held in-class. The midterm exam consists of Multiple Choice, True/False, Matching, and Short Answer Questions. | 2024-02-27 |
| **Group Presentation** | 4% | In group 10 minute presentations (2-3 people, max. 15 slides) based on the offered topics. Topic sign up will take place on Quercus before the end of January and a presentation schedule will be worked up for classes following reading week. | No Specific Date |
| **Laboratory Exercises** | 36% | Nine labs at 4% each. Labs are typically due at the start of the next exam period. | 2024-01-24,2024-01-31,2024-02-07,2024-02-14,2024-02-28,2024-03-20,2024-03-27,2024-04-03,2024-04-08 |
| **Bell Ringer** | 2% | A Bell Ringer test is a practical examination that tests your ability to quickly identify a rock from hand sample. You will have access to each sample for about 1 minute before moving on to the next. | 2024-03-29,2024-02-02,2024-02-16 |
| **Online Quizzes** | 6% | 3 online quizzes will be posted (see course schedule) and each quiz is 2 % (6% total) of final grade. Each quiz will consist of roughly 8 - 15 questions (multiple choice, True/False). These quizzes are to be completed individually. | 2024-01-26,2024-02-16,2024-03-28 |
| **Field Trip Notes** | 4% | You will be graded on the quality of your field book which will be handed in at the end of the day. | 2024-04-07 |
| **Final Exam** | 33% | The final exam is cumulative and consists of Multiple Choice, True/False, Matching, and Short Answer Questions. | Final Exam Period |

### Late Assessment Submissions Policy

If you know that you will miss a deadline then please let me know in advance, as we might be able to work something out. Should you miss a deadline for any term work you will be automatically deducted **10%** per day **(including weekends)** if you do not follow the following procedure and receive consideration.

Absences from Labs and Midterms, or missed coursework must be reported **both** through the DPES Self declaration Absence form (<https://www.utsc.utoronto.ca/physsci/self-declaration-absence-form-0>) AND through Acorn (<https://www.utsc.utoronto.ca/registrar/absence-declaration-acorn>) within 6 days of the missed coursework. You will be expected to make up the coursework or receive a zero.

Requests for deferrals of missed final exams must be processed through the registrar.

## Policies & Statements

### Academic Integrity

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.  
  
Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.  
  
On tests and exams, cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University.

### Plagiarism Detection Tool

Normally, students will be required to submit their course essays to the University's plagiarism detection tool for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the Centre for Teaching Support & Innovation web site (<https://uoft.me/pdt-faq>).

### Equity, Diversity and Inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.  
  
The University of Toronto is a richly diverse community and as such is committed to providing an environment free of any form of harassment, misconduct, or discrimination. In this course, I seek to foster a civil, respectful, and open-minded climate in which we can all work together to develop a better understanding of key questions and debates through meaningful dialogue. As such, I expect all involved with this course to refrain from actions or behaviours that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, religion, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, gender identity, gender expression, age, marital status, family status, disability, receipt of public assistance or record of offences.

### Accommodations

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible.  
  
AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email [ability.utsc@utoronto.ca](mailto:ability.utsc@utoronto.ca). The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

### Use of Generative Artificial Intelligence Tools

Students may use artificial intelligence tools, including generative AI, in this course as learning aids or to help produce assignments. However, students are ultimately accountable for the work they submit.

## Additional Content

**Labs**

Labs are mandatory (attendance is built in each lab grade) for all students and the respective assignments are graded. During laboratories/tutorials you will have a chance to work more independently in order to strengthen your knowledge; during the lectures you’ll receive more guidance throughout the material. The knowledge acquired during the laboratory exercises can also be tested in the Online Quizzes, term test and in the final exam.

**Required lab materials:**

- Ruler, protractor, small scissors, pencils, eraser

- Lab coat: Our lab exercises are held in a space classified as a laboratory – this means that we all should be dressed in lab coats – please bring them for tutorials (labs) and wear them at all times. Another consequence: There is no eating or drinking in the lab. Leave your snacks and drinks on the desk in front of EV222 and EV224!

**1-Day Field Trip – if weather permits - Location to be announced:**

This field trip is mandatory for all students. A fee for transportation will arise, which we will keep as low as possible. Furthermore, we are outdoors and therefore some preparations are needed:

* Be prepared for any kind of weather (sun vs. rain: rain jacket, sun screen, hat)
* Sturdy footwear (at least running shoes, ideally hiking boots) -> **NO open-toed shoes, sandals, or heels!!!**
* Adequate clothing (long pants, layers)
* Safety goggles or light tinted sun glasses
* Daypack with an adequate amount of water and lunch (+ smaller snack)
* If possible small camera, field book (e.g. small notebook), pencil & pen

Additional safety equipment (e.g. hard hats, additional safety goggles) required for the trip, will be supplied by the department.