University of Toronto-Scarborough
EESB20 - Sedimentology & Stratigraphy
Winter 2021-2022

Instructor:	Dr. Heidi Daxberger, Room EV466, email: heidi.axberger@utoronto.ca,		
	Virtual Office hours: Thursday, 10 am – 12 pm (Zoom) starting January 13th, 2022		
Teaching Assistant:	Edina Illyes		
Lectures:	**Tuesday**	**1 pm – 3 pm**	**Jan. 11-31: ONLINE, Feb. 1*: Room: IC 326**
Labs:	**Tuesday's Section**	**3 pm – 5 pm**	**Jan. 11-31: ONLINE, Feb. 1*: Room: EV 224**
	Wednesday's Section	**9 am – 11 am**	**Jan. 11-31: ONLINE, Feb. 1*: Room: EV 224**
	This could change due to Health Advisory!		

Overview:
This course will provide you with an integrated overview of the formation of clastic and carbonate sedimentary rocks, as well as an overview of the main depositional environments in which these rocks form.
During this course we will be covering rock classifications (material & texture), principles of sediment transport including fluid hydrodynamics and development of primary and secondary sedimentary structures of clastic sediments, and the various mechanisms for the formation of carbonate sediments. 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.
The Sedimentology & Stratigraphy course is a university-based course (laboratory intensive) that incorporates active and inquiry-based learning to help students maximise learning outcome achievements.

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:

- Solving Problem and analyse data
- Conduct textural analysis of sediments and sedimentary rock samples
- Classify and identify various sediments, sedimentary rocks and fossils
- Describe and log sediments and sedimentary rocks in the field (weather permitting)
- Interpret sedimentary facies and sedimentary structures, as well as drawing conclusions in terms of depositional environments and conditions
- Write laboratory reports and apply appropriate terminology
- Conduction literature reviews and research
- Create and deliver quality oral presentations

Course structure:
During a weekly two-hour lecture (Tuesdays from 1-3 pm, January: Online Zoom, information click here) I will introduce the theoretical background needed for facies and sequence stratigraphic analysis and interpretations. During the two-hour lab (section 1 on Tuesdays, 3 - 5 pm and section 2 on Wednesdays, 9 - 11 am, January: Online Zoom, information click here) students will learn the fundamentals of field and laboratory analysis of sedimentary rocks, including: sediment / sedimentary rock / fossil classification and identification, textural analyses and sedimentary structure interpretation, preparation of stratigraphic logs, stratigraphic correlation, facies analyses and interpretation of paleo-environments. If the weather and Health and Safety measures permit, I will organize a one-day field trip (possibly to the Niagara region) in early April 2022.

ATTENTION: Please read the syllabus carefully and contact me in case any sections are unclear, or you think issues may arise. Also, as these are strenuous times for all of us, please contact me as quickly as possible if any problems or situations arise that hinder you from completing your work on time. This will give us the opportunity to figure out a way of action and lower stress on all fronts.

Health and Safety Precautions/Equipment:

In case we can start meeting for in-person lectures please wear a medical, but even better a KN95 or N95 mask.
For in-person labs the department will provide face shields, safety goggles, lab coats (can be borrowed for the lab) and medical masks. You may want to purchase and bring your own lab coat and safety goggles.

Literature:

No course textbook, instead I can recommend the following as a useful manual for in the field.

Text (course reserve):

- 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

Course Schedule:

Week	Date	Topic	Date Lab	Lab topic	Due Dates	Quizzes
1	11. Jan	Lect. 1: Intro to Sed. Rocks				
2	18. Jan	Lect. 2: Clastic seds., textures, fabrics, structures	18. Jan	lab 1: clastic: grain size analysis	due 24. Jan. (5pm)	Q1
3	25. Jan	Lect. 3: Clastic seds., textures, fabrics, structures	25. Jan	lab 2: Clastic Rock ID/interpret.	due 27 Jan. (5pm)	
4	1. Feb	Lect. 4: Carbonates	1. Feb	lab 3: Sediment structures	due end of lab	
5	8. Feb	Lect. 5: Chem. Sed. Rocks, Facies Analysis/Facies Models	8. Feb	lab 4: Carbonate/Chem. Sedimentary R.	due end of lab	Q2
6	15. Feb	Lect. 6: Basics on Basins	15. Feb	Lab 5: Strat. Log Correlation	due 24. Feb. (5 pm)	
	22. Feb	Reading Week				
7	1. March	Midterm	1. March	Lab 6: Geology of Ontario	due 14. March (5 pm)	
8	8. March	Lect. 7: Continental Environments	8. March	Lab 6: Geology of Ontario + Summary Sheet	due 14. March (5 pm)	
9	15. March	Lect. 8: Cont.-Marginal Marine Environments	15. March	Lab 7: Virtual Field Trip Albion Falls	due 21. March (5 pm)	Q3
10	22. March	Lect. 9: Marginal Marine Environments, Shelf	22. March	Lab 8: Environments (Quercus)	due 28. March (5 pm)	
11	29. March	Lect. 10: Deep Water Environments	29. March	Lab 9: Environments + **Bell Ringer**	due 4. April (5 pm)	
	Sat. 1. April	In-Person Field Trip (field book due end of trip)				
12	5. April	Lect. 11: Sequence Stratigraphy	5. April	Flexible Lab		Q4
	9. - 12. April	Study Break				
	13. - 29. April	Exams				

Marking Scheme:

Group (2 students) presentations	6 %
Laboratory exercises 9 (9x3%)	27 %
Field Trip (1 % participation – 2 % Field Book) *or VFT Project**	3 %
Lecture participation (in-class exercises + ungraded lecture quizzes)	3 %
Glossary 6 terms (before midterm, before exam: 2 x 1.5 %)	3 %
Bell Ringer	2%
Midterm or Midterm Project (2 Days take home, open book, individual work)	25 %
Final exam or Final Project (3 Days take home, open book, individual work)	27 %
4 x 1% Online Quizzes	4 %
Total	**100 %**

** Field trip is subject to Health Advisory – if not possible we will do a VFT project.*

Use of Plagiarism Detection Tool (Quercus) For Submitted Academic Work:

"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 (Links to an external site.))."

Lectures & Lecture Participation (3%):

ALL students are expected to attend/review ALL lectures (synchronous or asynchronous). To maximize learning outcome achievement ***it is important for all students to take responsibility of their learning process and to ensure that notes are obtained for any classes missed.***

Additionally, to increase achievements regarding set learning outcomes (see weekly modules), I will integrate active learning in the lectures. These can be short exercises (individual, group) or ungraded lecture participation quizzes (quercus quiz, open for a week after the lecture). These will help to break up the lectures in smaller and more digestible portions and help to recap the discussed materials. To encourage active participation (synchronous or asynchronous) lecture participation is part of the final grade which will be **worth 3% of the final grade** (grade is not based on right answer, but participation). Graded participation will start in the **second week (Lecture 2)**. You can miss up to 25% of the participation activities without losing grades. If your participation is above 75%, you will get the full 3%. If your participation is between 75 and 50% you will get 1.5% of the participation mark. If your participation is below 50% no participation marks will be given (0%).

Lab exercises (3% each – total 27%):

The 9 Labs are mandatory for all students and the respective assignments are graded. During laboratories you will have a chance to work more independently 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 4 Online Quizzes, term test and in the final exam.

Planned 1-Day Field Trip – Niagara Region (3%) – Early April 2022:

If Health and Safety Regulations permit, we will do a field. 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, sunscreen, 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 sunglasses
- 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. You will be graded on participation (1%) and the quality of your field book (2%) which will be handed in at the end of the day.

Group Presentations: Depositional Environments (6%):

In group 15-minute presentations (2 people, max. 10 slides, worth 6%) based on the offered topics. Topics must be chosen and approved by the instructor by the end of January and a presentation schedule will be worked up for classes following reading week. The topic list will be posted on Quercus.

Midterm and Final Exam (24% and 27% accordingly) – Individual work:

Both, the midterm (2 Days) and Final Exam (3 Days) will be open book take home exams that may include open ended and reflection questions. To guarantee that rules about academic integrity and ethics are followed, the online plagiarism detection tool will be used.

Quercus Glossary – Individual Work (3%):

Part of the course work is to create **six glossary posts (each 0.5%, total 3 %)**. The glossary (make your own geodictionary) is hosted on quercus and will include the most important new terminology of the course. You can select **four terms** from the glossary list on

quercus. Student contributions will be monitored by the TAs and instructor throughout and by the end of the term (grade based on quality of posts – for more information see glossary main page on quercus).
Posts only graded if submitted by deadlines:
Three of the posts have to be finished by Sunday February 28th (terms including lecture 5), and the second three post by April 5!

Bell-Ringer Tests – Individual Work (2%) – In-Person or Online (depending on Health Advisory):
In the course schedule above, you will find a date for a Bell Ringer Test (2% of final grade). The c. 10-minute bell ringer will test your rock and fossil ID skills and is based on the lecture/lab samples. Before the Bell Ringer happens, the lab (ESCB 224 or online in case of a Pandemic-caused shutdown) will be opened to look at the lab samples.

Study Questions:
I will post a set of study questions on each course topic (in weekly quercus module), which should help you to identify the important course information, study for the quizzes and exams, prepare you for the field trip and to keep on top of the material.

Library Services:
Research Help: University of Toronto Scarborough Library
Staff at the UTSC Library will be happy to help you find the resources you need for your assignments and learn the research skills you will need for success at university.
Research help is available by phone, e-mail, chat, or in-person in the Library.
For more information, please see the Library's Help Guide for UTSC Students: http://guides.library.utoronto.ca/utsc_help
Need in-depth or department specific assistance? Contact Sarah Forbes, Liaison Librarian for Physical and Environmental Sciences: http://uoft.me/smforbes

Missed academic work:
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 without informing the instructor for any term work you will be automatically penalized **5% *per day* (including weekends)** if you do not follow the following procedure and receive consideration.
Within **one week** of the missed deadline you must submit a completed **UTSC Verification of Student Illness or Injury** (https://www.utsc.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf) as well as a **letter from you** describing when you fell ill, how it prevented you from making the deadline and when you returned to school. Submit the certificate and the letter to the instructor. Carefully following this process will allow us to properly consider you for consideration regarding your late/missed work for EESB20.

Academic Integrity Statement:
Academic integrity is one of the cornerstones of the University of Toronto. It is critically and important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. According to Section B of the University of Toronto's Code of Behaviour on Academic Matters which all students are expected to know and respect, it is an offence for students:

- To use someone else's **ideas or words** in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.
- To include false, misleading or concocted **citations** in their work.
- To obtain **unauthorized assistance** on any assignment.
- To provide **unauthorized assistance** to another student. This includes showing another student completed work.
- To submit their own work for credit in **more than one course** without the permission of the instructor.
- To falsify or alter any **documentation** required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an **unauthorized aid** in any test or exam.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values which they protect. It is your responsibility to ensure that your work maintains academic integrity. If you have any concerns, please see the instructor before a potential problem arises. Please familiarize yourself with the Code (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). At the University of Toronto academic dishonesty can result in a

mark of zero, a reduction in final grades, denial of privileges, a monetary fine, failure in the course, suspension, permanent record, a recalling of degrees/diplomas and certificates, or expulsion.

Accessibility Needs:

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible: UTSC campus AccessAbility http://www.utsc.utoronto.ca/~ability/ or St. George Campus Dis*Ability* *d*isability.services@utoronto.ca or http://studentlife.utoronto.ca/accessibility.