University of Toronto-Scarborough
EESB20 - Sedimentology & Stratigraphy
Winter 2020-2021

Instructor: Dr. Joel Ben-Awuah, email: joel.ben-awuah@utoronto.ca/ jbenawuah@gmail.com
Teaching Assistant: Nicole Anasis

Lectures:	**Tuesdays**	**1 pm – 3 pm**	**Room: Online**
Labs:	**Tuesdays**	**3 pm – 5 pm**	**Room: Online**

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.
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

Course structure:
During a weekly two-hour lecture (Tuesdays from 1-3 pm) I will introduce the theoretical background needed for facies and sequence stratigraphic analysis and interpretations. During the two-hour lab (Tuesdays, 3 - 5) students will learn the fundamentals of field and laboratory analysis of sedimentary rocks, including: sedimentary rock classification and identification, textural analyses and sedimentary structure interpretation, preparation of stratigraphic logs, stratigraphic correlation, facies analyses and interpretation of paleo-environments. There will be a virtual fieldtrip.

Literature:
No course textbook, instead, I will be posting occasional readings. However, I do recommend the following as a useful manual for in the field.

Good to get:
Sedimentary Rocks in the Field – A Practical Guide, M.E., Tucker, latest edition, Wiley-Blackwell

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	Quizzes	quizzes
1	12. Jan	**Lect. 1:** Introduction Sed. Rocks				
2	19. Jan	**Lect. 2:** Clastic seds., textures, fabrics, structures	19 Jan	**Lab 1:** Clastic: Grain Size Analysis or an Alternative	lab due Tuesday 1pm	Q1
3	26. Jan	**Lect. 3:** Clastic seds., textures, fabrics, structures	26 Jan	**Lab 2:** Clastic Rocks ID / Interpretation	lab due Tuesday 1pm	
4	2. Feb	**Lect. 4:** Carbonates	2 Feb	**Lab 3:** Sediment Structures	lab due Tuesday 1pm	Q2
5	9. Feb	**Lect. 5:** Chemical Sedimentary Rocks, Facies Analysis & Facies Models	9 Feb	+ Lab 4: Carbonate & Chemical sediments	lab due Tuesday 1pm	
	16 Feb	Reading week				
6	23. Feb	**Lect. 6:** Basics on Basins	16 Feb.	**Lab 5:** Stratigraphic logs + correlation	lab due Tuesday 1pm	
7	2. March	**Lect.7:** Continental Environments	2 March	**Lab 6:** stratigraphic log Drawing – S.-Ontario		
8	9 March	**Midterm**	9 March	**Lab 6:** stratigraphic logs + Summary Sheet	**Lab 6 + Summary Sheet: due at beginning of class on March 16**	
9	16. March	**Lect. 8:** Continental - marginal Marine Environments	16 March	**Lab 7:** Environments	lab due Tuesday 1pm	Q3
10	23. March	**Lect. 9:** Marginal Marine Environments	23 March	**Lab 8:** Environments (block models)	lab due Tuesday 1pm	
12	30 March	**Lect. 10:** Deep Water Environments	30 Marc	**Bell Ringer**		Q4
	6. April	Study Break/ Revision				

Marking Scheme:

Group (2 students) presentations	6 %
Laboratory exercises 8 (8x3%)	24 %
Virtual Field Trip Exercise	**3 %**
Glossary 6 terms (before midterm, before exam: 2 x 1.5 %)	3 %
Midterm	25 %
Final exam	30 %
6 x 1.5% Online Quizzes/ Bell Ringer	9 %
Total	**100 %**

Lectures:

ALL students are expected to attend ALL lectures.

It is the responsibility of the student to ensure that notes are obtained for any classes missed.

Lab exercises (3% each – 24%):

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 10 Online Quizzes, term test and in the final exam.

1 Virtual Field Trip Assignment (3%):

More information will be provided later

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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.

Quercus Glossary (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 **six 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 14th (terms including lecture 5), and the second three post by March 21!

Bell-Ringer/ Quizzes – (9%):

In the course schedule above you will find a date for **Quizzes and** Bell Ringer Tests (1.5% each for a total 9% of final grade). The c. 10 minute bell ringer will test your rock ID skills and is based on the lecture/lab samples.

Study Questions:

I will post a set of study questions on each course topic, 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 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) and also with the handout "How not to plagiarize", available in the Course Documents section on BB. 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.