

University of Toronto-Scarborough
Department of Physical and Environmental Sciences
EESB15H3 Earth History - Fall 2021 - Online

Prerequisites: EESA06 Planet Earth
Course website: <https://q.utoronto.ca/courses>

Instructor: Dr. Kirsten Kennedy (contact through Quercus inbox preferred)
Virtual Office hours: **Friday 11 am - 1 pm, and by appointment (via microsoft teams or zoom)**

Teaching Assistant: TBD

Lectures: Online through Teams
First lecture is on: Thursday Sept. 9, 2020 at 7-8 pm
Monday 2 - 3 pm
Thursday 7 - 8 pm

Lab Exercises: **TUT001 and TUT002: Thursday 8 - 10 am starting sept 16**
TUT003: Friday 8 - 10 am starting sept 17

***NOTE:** This course was initially designed for in-person delivery. However, due to the current situation we are working hard to convert all components of the course (lectures, in-class exercises, laboratory exercises, field trip) into online or virtual components. Therefore, we ask you for your patience and understanding if hiccups occur during online delivery. At the beginning of the course we would love to hear what expectations you have of the course (“Beginning of the course questionnaire”). Furthermore, would love to hear about your learning experience in form of short anonymous questionnaires in the middle and by the end of the course.*

Overview:

During this online Earth History course, we will utilize online lectures (live + recorded), online modules (accessible via links on Quercus), virtual labs -field trips, discussion board posts, online quizzes as well as online glossaries to learn about our planet’s development and evolution.

In the first half of this course you will learn about the building blocks of our planet and the most important geological processes and concepts that underlie Earth’s formation and evolution. Then we will move on to learning about the 4.56 Billion year-long evolution of our planet during which we will hear about global events and process, but often will focus on the evolution of the North American Continent in a bit more detail.

We will be starting with the tiniest building blocks of our planet, chemical elements and minerals, and move on to how and where rocks (e.g. igneous, sedimentary and metamorphic rocks) are formed and how these can help us deciphering Earth’s historical record of the past 4.56 billion years. We will discuss how the study of plate tectonics emerged and how this process constantly reshapes our planet’s surface. Preservation of long dead organisms (fossils) and rock records help us to delineate exactly these plate tectonic movements and therewith the evolution of Earth’s continental masses we all live on today.

The rock record and accumulated knowledge of short- and long-term geological processes, as well as rock and sediment properties, becomes more and more important as the human population grows. We are in dire need of a clear understanding of processes such as plate tectonics/rock deformation process (e.g. earthquakes), formation of natural resources (e.g. minerals, oil/gas), fresh water reservoir formation (porous rock). All this we can learn from our planets past so we hopefully use and protect all resources as efficiently as possible and most importantly are more informed on how to protect our environment for future generations.

One of the lab exercises in this course will be a virtual field trip to Port Colborne (Niagara Region, Ontario), where we will practice the learned skills such as rock and fossil description and identification. At this field site one can the rocks provide us information regarding paleo-environments and possible plate tectonic events that took place in NE-Northern America during the Devonian time period.

My biggest course goal is to make you all more aware of your environment and what it can tell you. Our planet is beautiful and its development is one big riddle. And everywhere are clues in form of minerals, rocks, fossils (etc.) for you to investigate. With their help we can figure out what happened in most recent past or even billions of years ago.

Learning Outcomes:

This course aims to introduce and develop the basic geo-scientific and soft skills so you as a student will be able to/has developed:

- **use** geology specific terminology
- **explain** basic geologic concepts and processes (e.g. rock formation, plate tectonics...)
- **apply** the learned knowledge about geological concepts and methods during lab exercises and a (virtual) field trip.
- **describe, identify and differentiate** between important minerals, rocks types and fossils, as well as drawing conclusions about their formation (lab exercises, field trip).
- **retrieve and interpret** basic geologic information from geological maps, cross-sections and 3D box models (lectures, lab exercises)
- **relate** given data (e.g. fossil occurrence, rock type) to respective geologic processes, environments or historical events (lectures, lab exercises, field trip)
- **work** in a team during lab exercise

Literature - Required: H. Levin, *The Earth Through Time*, 11th edition, Wiley (10th editions is also ok, available as e-books for rental or purchase - <https://www.wiley.com/en-ca/The+Earth+Through+Time%2C+11th+Edition-p-9781119117063>)

Other good sources: St. M. Stanley & J.A. Luczaj, *Earth System History*, Freeman (course reserve)

Lecture Schedule - Subject to change:

Week	Lect Nr.	Day	Lect. Date	Live Lect. topic	Pre-Lab (complete before lab period)	Lab topic	Lab Exercise Due	Other
1	1	Thursd ay	Sept. 9	Intro				
2	2	Mond ay	Sept. 13	Elements & Minerals	Mod. 1. Minerals	Module 1 lab: Minerals	Sunday Sept 19 th , midnight	
2	3	Thursd ay	Sept. 16	Igneous Rocks				
3	4	Mond ay	Sept. 20	Igneous rocks & Sediments - Sed. Rocks: Weathering	Mod.2. Igneous Rocks	Module 2 Lab: Igneous Rocks + Minerals	Sunday Sept 26 th , midnight	
3	5	Thursd ay	Sept. 23	Sediments - Sed. Rocks: Erosion & Transport				
4	6	Mond ay	Sept. 27	Sediments - Sed. Rocks: Classification & Structures	Mod. 3 Sedimentary Rocks and Fossilization	Module 3 Lab: Sediments and Fossilization	Sunday, Oct 3, midnight	
4	7	Thursd ay	Sept 30	Sediment Structures & Fossils				

5	8	Monday	Oct. 4	Metamorphic Rocks	Mod. 4: Metamorphic Rocks	Module 4 Lab: Metamorphic Rocks + Minerals	Sunday, Oct 17 midnight	
5	9	Thursday	Oct. 7	Earth's Properties, Geologic Processes, Plate Tectonics				
READING WEEK								
6	10	Monday	Oct. 18	Geologic processes	Mod. 5: Earth's Prop., Geol. processes, Plate Tectonics			
6	11	Thursday	Oct. 21	Geologic principles and time		Mod. 5: Earth's Prop., Geol. processes, Plate Tectonics	Sunday Oct 24 Midnight	Bellringer Quiz! Available Oct 19-Oct 23 midnight
7	12	Monday	Oct. 25	Geologic Time + Hadean - Archean	Mod. 6. Geologic Principles & Time:			
7	13	Thursday	Oct. 28	Archean		Module 6 Lab: Geologic Time	Sunday oct 31 Midnight	
8	14	Monday	Nov. 1	Proterozoic Life	Module 7: The Precambrian			
8	15	Thursday	Nov. 4	Early Paleozoic Processes		Module 7 Lab: The Precambrian	Sunday Nov 7 Midnight	
9	16	Monday	Nov. 8	Early Paleozoic Processes & Life	Mod. 8: Paleozoic Times			
9	17	Thursday	Nov. 11	Middle Paleozoic		Module 8: Paleozoic	Sunday Nov 14 Midnight	
10	18	Monday	Nov. 15	Late Paleozoic Processes	None.			
10	19	Thursday	Nov. 18	Mesozoic processes		Virtual Field Trip: Port Colborne Quarry	Sunday Nov 21 Midnight	
11	20	Monday	Nov. 22	Mesozoic processes + Life	Mod. 9: Mesozoic Times			
11	21	Thursday	Nov. 25	Mesozoic life		Lab Module 9: Google Earth – Investigate Real Geology	Sunday Nov 28 Midnight	
12	22	Monday	Nov. 29	Cenozoic Geol. Processes	Mod. 10: Cenozoic Times			
12	23	Thursday	Dec. 2	Cenozoic Geol. Processes & Life		Module 10 Lab: Google Earth - Inv. Cenozoic geology	Sunday Dec 5 Midnight	
13	24	Monday	Dec. 6	Recap				
13				Study Break				

Marking Scheme:

10 x Online Labs (each 3.6%)	36%
Virtual Field Trip	4%
Course Participation (discussion board etc.)	2%
Glossary (6 entries each 0.5%)	3%
Online Bell Ringer (Min., Rock, Fossil ID)	2%
Online Midterm	20%
<u>Final Exam (date to be announced)</u>	33%
Total	100%

Lecture and Online Participation (2%):

Lectures will be held live (Microsoft Teams), but also recorded and posted on Quercus. Additionally, every session will be recorded. Participation during the live lectures is recommended, but based on the current situation not mandatory. There may be in-class exercises or referrals to a discussion board, but all students can contribute/participate after the fact (a 5-day time limit after the lectures will be applied, to be able to count your contributions for active course participation).

A moderator will monitor the participation during these activities and allocate participation grades accordingly at the end of the term (participation between 100% and 75% during activities = 2% grade, participation of 75% - 50% of activities = 1 % grade, participation of 50% and lower = 0% grade).

Labs (36%)

We will do **ten Online Lab exercises**. Each lab will consist of a 'pre-lab' component which is required to be completed prior to the lab, but is marked by completion only and is worth 0.6%. During the live lab session, students will complete a lab exercise (worth 3%) that will be due the following Sunday night at Midnight. During these live sessions the TAs (and possibly the course instructor) will be present to guide you and answer questions.

Bell Ringer - Recap Mineral, Rock Test – Individual Work (2%):

At the end of the 'rock' section of this course, a Bell Ringer Test will be held. This c. 20 min test will test your mineral, rock and fossil ID skills and is based on the lab samples.

Quercus Glossary (3%):

Part of the course work is to create **SIX glossary posts (each 0.5%, total 3%)**. The glossary (make your own geo-dictionary) 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 term definition – figure/diagram if applicable).

THREE of the posts have to be finished by Nov. 1, and the second set of THREE post by December 7, 2019!

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 **University of Toronto medical certificate** 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 as well as your name and student number and the course code.

Submit the certificate and the letter the instructor. Carefully following this process will allow us to properly consider you for consideration regarding your late/missed work for EESB15.

Please be proactive in your communications with me as the instructor, as I am sure that we can avoid such penalties!

Midterm

The midterm is scheduled by the registrar and held at some point mid-course. The exam will be held online through the quercus system and will contain multiple choice, true and false and short answer questions. Lecture material and lab material is testable.

Final Examination:

The final examination will be 3 hours, is cumulative (1/3 before midterm, 2/3 after midterm) and will be scheduled by the University and held during the December examination period. The exam will contain multiple choice, true and false and short answer questions. Figures, movies and animations are examinable, as are in-class participation/lab type exercises. The exam will be more heavily focused on post-midterm material. The assigned readings, lecture, and lab materials are examinable.

Quercus:

This course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. The site is dynamic and new information and resources will be posted regularly as we move through the term, so please make it a habit to log in to the site on a regular, even daily, basis. To access the course website, go to the U of T Quercus log-in page at <https://q.utoronto.ca>. Once you have logged in to Quercus using your UTORid and password, you should see the link or "card" for B15 Earth History. You may need to scroll through other cards to find this. Click on B15 Earth History link to open our course area, view the latest announcements and access your course resources. There are Quercus help guides for students that you can access by clicking on the "?" icon in the left side column. SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

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>

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/exercise/quiz.
- 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.*

Course Materials, including lecture notes

Course materials are provided for the exclusive use of enrolled students. Do not share them with others. I do not want to discover that a student has put any of my materials into the public domain, has sold my materials, or has given my materials to a person or company that is using them to earn money. The University will support me in asserting and pursuing my rights, and my copyrights, in such matters.

Video recording and sharing (download permissible; re-use prohibited)

This course, including your participation, will be recorded on video and will be available to students in the course for viewing remotely and after each session.

Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. In this course, you are permitted to download session videos and materials for your own academic use, but you should not copy, share, or use them for any other purpose without the explicit permission of the instructor.

For questions about the recording and use of videos in which you appear, please contact your instructor.

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 DisAbility disability.services@utoronto.ca or <http://studentlife.utoronto.ca/accessibility>.

Religious Accommodations

The University has a commitment concerning accommodation for religious observances. I will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. According to University Policy, if you anticipate being absent from class or missing a major course activity (like a test, or in-class assignment) due to a religious observance, please let me know as early in the course as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

Grading

Refined Letter Grade Scale	Grade Point Value	Numerical Scale of Marks
A+	4.0	90 - 100%
A	4.0	85 - 89%
A-	3.7	80 - 84%
B+	3.3	77 - 79%
B	3.0	73 - 76%
B-	2.7	70 - 72%
C+	2.3	67 - 69%
C	2.0	63 - 66%
C-	1.7	60 - 62%
D+	1.3	57 - 59%
D	1.0	53 - 56%
D-	0.7	50 - 52%
F*	0.0	0 - 49%