

Geology I Syllabus

Department of Earth and Environmental Science

ERTH1080 - Fall 2023

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor(s)

| Name | Email | Office Hours |
|------------------|-------------------------|--|
| Vittorio Maselli | vittorio.maselli@dal.ca | By appointment (virtual or in person - Life Sciences Building, Rm. 4618) |
| Mike Young | mike.young@dal.ca | By appointment (virtual) or in the lab times |

Course Description

This course focuses on the solid earth (geosphere), how it was formed and how it evolved through time. It explores the materials constituting the geosphere and the natural processes driving their formation. Specifically, we will investigate (1) the physical processes that led to the formation of the planet Earth and its place in space and time within the Universe, (2) the structure of the Earth and its dynamic aspect (plate tectonics and consequences), (3) the different types of rocks and the way they form and are deformed, (4) the topography of continents and the formation of mountain ranges, (5) the mechanisms and examples of major geological hazards: volcanic eruptions, earthquakes, and tsunamis, and (6) how time is measured at geological timescales.

Course Prerequisites

This class meets the needs of students who require a science class with a lab component, is a required prerequisite class for all Earth Science majors and serves as an introduction for all those interested in Earth Sciences. No previous knowledge of geology is required.

Course Structure

Course Delivery

The course is delivered in-person and classes will not be recorded. Consequently, attendance is highly recommended.

The course is organized into 12 weeks (05 SEP 2023 to 06 DEC 2023), two 80-minute lectures each week, plus seven labs and two lab quizzes.

Lectures

Monday and Wednesday, 16:05 - 17:25, STUDLEY LSC-COMMON AREA C240

Laboratories

CRN 11338, Section B01 – Wednesday 11:35 - 14:25, STUDLEY LSC-BIOL&EARTH B2055

CRN 11340, Section B03 – Thursday 8:35 - 11:25, STUDLEY LSC-BIOL&EARTH B2055

CRN 11341, Section B04 – Tuesday 8:35 - 11:25, STUDLEY LSC-BIOL&EARTH B2055

Course Materials

Suggested: Stephen Marshak, *Earth – portrait of a planet, 6th Edition*, W.W. Norton & Company, New York (<https://wwnorton.com/showcase/earth/welcome.html>)

Optional Lab Manual: Laboratory Manual for Introductory Geology, Ludman and Marshak (4th Edition) is available at the bookstore as either E-book or in print.

Additional course material will be posted to Brightspace.

Class expectation

You're expected to participate in the learning activities with your peers and you'll be required to integrate relevant information discussed into your assignments.

Students are expected to behave in an appropriate manner. Lively discussion and conflicting opinions are welcome and encouraged, but personal attacks, disrespectful comments, and gender or racial slurs **will not** be tolerated.

You can be more successful by:

- Familiarizing yourself with the syllabus and course schedule.
- Planning ahead and set aside time in your calendar to work on course assignments.
- Asking questions! If you're unsure about anything, ask an anonymous question in the Questions discussion board, send me an email, or make an appointment.

Assessment

| COMPONENT | WEIGHT (% of final grade) | DATE |
|---------------|------------------------------|--|
| Labs | 30% | Labs due at the end of the lab period; a grace period of up to 24 hrs will be granted. |
| Assignment 1 | 10% | Sunday, 8 October (midnight) |
| Mid-Term Exam | 20% | Tuesday, 31 October 2023 (online, duration 3 hours) |
| Assignment 2 | 10% | Sunday, 26 November (midnight) |
| Final Exam | 30% | Scheduled by registrar (online, duration 3 hours) |

Note: Assignment 1 and 2 and the Mid-Term Exam will be held outside of scheduled class time. Consequently, the length and time window will be discussed in the class to accommodate students who have conflicts with other scheduled courses.

The final exam is scheduled by the registrar and will take place during the exam period.

Conversion of numerical grades to final letter grades follows the

[Dalhousie Grade Scale](#)

| | | | |
|-------------|------------|------------|-----------|
| A+ (90-100) | B+ (77-79) | C+ (65-69) | D (50-54) |
| A (85-89) | B (73-76) | C (60-64) | F (0-49) |
| A- (80-84) | B- (70-72) | C- (55-59) | |

Course Policies on Missed or Late Academic Requirements

- 1) If the mid-term exam is missed due to unforeseen circumstances, the final exam will count for 50%.
- 2) All labs are mandatory. You will be expected to catch up on missed materials. Labs and lab quizzes will count for 30% of the final grade (15% for the seven labs and 15% for two lab quizzes)
- 3) It is necessary to pass the lab component to pass EARTH 1080. All labs are counted toward the lab grade. Lab materials will be included on the midterm and final exam.
- 4) The Final Exam will incorporate lecture and lab material. The exam date is scheduled by the registrar and cannot be changed (December 9 and 19). Do not make plans to return home over the holidays until the exam schedule is posted in early October.
- 5) Attendance at departmental guest lectures is recommended.

Course Policies related to Academic Integrity

- 1) Too similar papers will be considered as plagiarism. This applies to assignments and labs.
- 2) Plagiarism software will be used in the course.
- 3) The use of generative AI and large language models (e.g., ChatGPT) is not allowed in support of assignments and term exams.
- 3) Students are expected to use the Student Declaration of Absence form for late or missed requirements. The use of the form is restricted to 2 times for the tests, and 1 time for the assignments. For the labs, students should contact the lab instructor directly and prior to the lab to arrange additional time to complete the lab. In no circumstances will labs be accepted if that lab has been graded and returned to the class. In cases where the Student Declaration of Absence form is used outside of the conditions set above or the missed academic requirement is unjustified, the student will receive a null grade for that missed academic requirement.
- 4) No makeup exams, no makeup assignments, no makeup labs.

Learning Objectives

- 1- Acquire a basic understanding of how planet Earth was formed and works.
- 2- Acquire scientific reasoning: from the observation of natural facts to their interpretation in terms of processes.

Course Content

| WEEK | DATE (2023) | LECTURE | Book Chapters | LABS |
|------|-------------------------|--|----------------|---|
| 0 | Wednesday, 6 September | Course introduction (Syllabus) and an Introduction to Geology | Prelude | No Lab |
| 1 | Monday, 11 September | 16:05 - 17:25 The birth of the Earth | 1 | No Lab |
| 1 | Wednesday, 13 September | 16:05 - 17:25 Internal structure of the Earth | 2, Interlude D | |
| 2 | Monday, 18 September | 16:05 - 17:25 Plate Tectonics | 4 | Lab 1. Plate Tectonics |
| 2 | Wednesday, 20 September | 16:05 - 17:25 Plate Tectonics | 4 | |
| 3 | Monday, 25 September | 16:05 - 17:25 Minerals | 5 | Lab 2. Minerals I |
| 3 | Wednesday, 27 September | 16:05 - 17:25 Minerals | 5 | |
| 4 | Monday, 2 October | National Day for Truth and Reconciliation University closed | | Lab 3. Minerals II |
| 4 | Wednesday, 4 October | 16:05 - 17:25 Introduction to rocks | Interlude A | |
| 5 | Monday, 9 October | Thanksgiving Day University Closed | | Lab 4. Igneous Rocks |
| 5 | Wednesday, 11 October | 16:05 - 17:25 Igneous rocks | 6 | |
| 6 | Monday, 16 October | 16:05 - 17:25 Igneous rocks | 6 | Lab Quiz #1 (Mineral Identification) |
| 6 | Wednesday, 18 October | 16:05 - 17:25 Sedimentary rocks and soil | 7 | |
| 7 | Monday, 23 October | 16:05 - 17:25 Sedimentary rocks and soil | 7, Interlude B | Lab 5. Sedimentary rocks |

| | | | |
|--|---------------------------|--------------------------|--|
| 7 | Wednesday, 25 October | 16:05 - 17:25 | |
| | | Metamorphic rocks | 8 |
| 8 | Monday, 30 October | 16:05 - 17:25 | MIDTERM EXAM Tuesday, 31 October |
| | | Metamorphic rocks | |
| 8 | Wednesday, 1 November | 16:05 - 17:25 | |
| | | Rock deformation | |
| Note: No Labs during week 8 | | | |
| 9 | Monday, 6 November | 16:05 - 17:25 | Lab 6. Metamorphic Rocks |
| | | Rock deformation | |
| 9 | Wednesday, 8 November | 16:05 - 17:25 | |
| | | Geochronology | |
| 13 - 17 November 2023, Fall Study Break, NO CLASSES | | | |
| 10 | Monday, 20 November | 16:05 - 17:25 | Lab 7. Structural geology and geologic time |
| | | Geochronology | |
| 10 | Wednesday, 22 November | 16:05 - 17:25 | |
| | | Volcanoes | |
| 11 | Monday, 27 November | 16:05 - 17:25 | Lab Quiz #2 (Rock Identification) |
| | | Volcanoes | |
| 11 | Wednesday, 29 November | 16:05 - 17:25 | |
| | | Earthquakes and tsunamis | |
| 12 | Monday, 4 December | 13:05 - 14:25 | |
| | | Earthquakes and tsunamis | |
| 12 | Wednesday, 6 December | 16:05 - 17:25 | |
| | | Open discussion | |

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.html>

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at:

https://www.dal.ca/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy-.html

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.

Student Resources and Support

University Policies and Programs

Important Dates in the Academic Year (including add/drop dates):

http://www.dal.ca/academics/important_dates.html

Classroom Recording Protocol:

https://www.dal.ca/dept/university_secretariat/policies/academic/classroom-recording-protocol.html

Dalhousie Grading Practices Policies:

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html

Sexualized Violence Policy: https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Learning and Support Resources

General Academic Support – Advising (Halifax): https://www.dal.ca/campus_life/academic-support/advising.html

General Academic Support – Advising (Truro): <https://www.dal.ca/about-dal/agricultural-campus/ssc/academic-support/advising.html>

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness.html

On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Indigenous Connection: <https://www.dal.ca/about-dal/indigenous-connection.html>

Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student

Centre or contact the program at elders@dal.ca or 902-494-6803:

<https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

Black Student Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre.html

South House Sexual and Gender Resource Centre: <https://southhousehalifax.ca/about/>

LGBTQ2SIA+ Collaborative: <https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/LGBTQ2SIA-collaborative.html>

Dalhousie Libraries: <http://libraries.dal.ca/>

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>

Dalhousie Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Human Rights and Equity Services: <https://www.dal.ca/dept/hres.html>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Safety

Biosafety: <http://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <http://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Laser Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html>