Geomorphology Syllabus

Department of Earth and Environmental Sciences

ERTH/GEOG 3440 Winter 2025

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
Dr. Christiane Zoghbi	christiane.zoghbi@dal.ca	M, W 10:30 - 12:00 LSC, 3rd Floor, Room 3085
Bailey Grondin	bailey.grondin@dal.ca	TBA

Course Description

Geomorphology is the quantitative study of Earth's surface processes and landforms with applications in geology, civil engineering, hydrogeology, and environmental management. We investigate slope stability, weathering and soils, sediment production, wind-driven and coastal environments, tectonic landforms, and river, glacial and permafrost processes.

Course Prerequisites

ERTH 1080 (or SCIE 1506.09/SCIE 1507.09) and (ERTH 1090.03 or ERTH 1091.03); OR completion of (or concurrent enrolment in) a 1000-level mathematics class, a 1000-level physics class, a 1000-level chemistry class AND permission of instructor. CROSS-LISTING: GEOG 3440.03.

You are expected to have a working knowledge of algebra, basic trigonometry, and first-year geology. Calculus may be used for the derivation of some of the algebraic expressions that are used in assignments; although you do not need to use calculus yourself in any assignments or exams. An understanding of integration and differentiation may be helpful to understanding

course materials. A background in statics and dynamics at the level of a 1st year university physics course is highly recommended.

Course Structure

Course Delivery

In-person. Lectures will not be recorded. Students are expected to attend all classes in person. If unable to attend, use the student declaration of absence form. For extended absences, contact the instructor and the Assistant Dean of Student Affairs.

Lectures

W 5:35-8:25 p.m. Studley LSC-COMMON AREA C216

Laboratories

This course does not have scheduled labs or tutorials. Assignments are lab-like in content but are completed at your own time and location using materials distributed on Brightspace.

Course Materials

Course slides, assignment materials, and required readings are posted on Brightspace. You must submit your assignments to a Brightspace as a Word document (.docx) file by 5pm on the due date. You must have access to a computer with spreadsheet and drawing software at minimum (a Dal computer lab computer is sufficient).

Main reference

- Anderson, R. S., Anderson, S. P. (2010). Geomorphology: The Mechanics and Chemistry of Landscapes. (n.p.): Cambridge University Press.

Suggested textbooks:

- Huggett, R. J., & Shuttleworth, E. (2023). *Fundamentals of geomorphology* (Fifth edition.). Routledge.
- Burbank, D. W., & Anderson, R. S. (2001). *Tectonic geomorphology*. Blackwell Science.
- Ritter, D. F. (1986). *Process geomorphology* (2nd ed.). W.C. Brown.
- Trenhaile, A. S. (2016). *Geomorphology : a Canadian perspective* (Sixth edition.). Oxford University Press.

These textbooks are available through Killam (or Sexton) 3h loan. They are supplementary, not required, but some students find them useful.

Assessment

The assignments, midterm exam, and final exam contribute to your final grade as specified below.

Component	Weight (% of final grade)	Due Date (2025)
Midterm (1h30)	15	Feb 26
Assignments (3, equally weighted)	45	Feb 10, Mar 10, Apr 7
Final exam (3h, cumulative)	40	Final Exam Period

Other course requirements

1) **Exams** contain a mix of multiple choice, short answer, paragraph-answer, calculation, and graph-and draw questions. Drawings and diagrams on tests, labs, and assignments must be completely labeled, legible, and precise. Points may be deducted for spelling, incomplete sentences (except where point form is specified) and other grammatical errors.

2) The **assignments** are lab-like in content but you complete them at your own time and place. Each assignment requires hands-on work and calculations followed by a write-up which is a high quality technical report, as though you (the student) are an employee or owner of a geoscience company that does applied geomorphology.

3) **Accommodations**: Any student with a disability that may prevent him/her from fully demonstrating his/her abilities should contact the Dalhousie Student Accessibility Services office.

4) Please feel free to consult with me during office hours or by appointment if you have questions, comments, or problems.

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. Assignments submitted late and without an approved extension will be deducted 10% per day.
2. Extensions for assignments are granted for exceptional circumstances, using the Student Declaration of Absence Form. Applications for extensions must be made in writing to Dr. Zoghbi 24 hours before the assignment or exam due. The Student Declaration of Absence Form may be used two times this semester.

3. Missed assignments: if you do not complete a test or assignment and do not submit a Student Declaration of Absence form for that week, your mark on the test or assignment is zero.
4. All assignments must be submitted through Brightspace. E-mailed submissions will not be accepted.

Course Policies related to Academic Integrity

Feel free to use AI-driven tool to assist you in learning but remember that the objective is for you to acquire these competencies and outcomes in this course. You are responsible for all work that you produce, whether assisted by an AI-driven tool or not. You must acknowledge all tools used to assist you. If applicable, you must provide links to chat logs. If the work that you produce is suspected to misrepresent your own competencies, you may be asked to complete a supplemental assessment to evaluate your mastery of course outcomes.

Learning Objectives

Following active participation in this course you will be able to:

1. Identify, using photographic and topographic data, landforms produced by glacial, fluvial, hillslope, aeolian, coastal and periglacial processes.
2. Familiarity with a suite of geochronologic tools useful for determining the age and rates of formation of Cenozoic landforms.
3. Give descriptions, in some instances quantitative, of the processes that generate landforms.
4. Independently produce technical reports in the discipline of geomorphology, that include text, graphs, topographic and other data.

Course Content

Week	Date	Lesson Topic(s)	Reading	Assessment
1	Jan 6-11	Schedule and Intro	A&A - Ch 1	
2	Jan 12-18	Whole Earth Morphology & Large-Scale Topography Tectonic Geomorphology	A&A - Ch 2&3 A&A - Ch 4	
3	Jan 19-25	Tectonic Geomorphology	A&A - Ch 4	
4	Jan 26-Feb 1	Dating Methods	A&A - Ch 6	
5	Feb 2-8	Hillslopes	A&A - Ch 10	
6	Feb 9-15	Glaciers and Glacial Geology	A&A - Ch 8	Assignment 1
	Feb 16-22	STUDY BREAK		
7	Feb 23-Mar 1	MIDTERM		
8	Mar 2-8	Glaciers and Glacial Geology	A&A - Ch 8	
9	Mar 9-15	Periglacial Processes and Forms	A&A - Ch 9	Assignment 2
10	Mar 16-22	Water in the Landscape: Drainage Basins/Fluvial Geomorphology	A&A - Ch 11	
11	Mar 23-29	Rivers	A&A - Ch 12	
12	Mar 30-Apr 5	Review Session	A&A - Ch 12	
13	Apr 6-8	Exam period starting Apr 9		Assignment 3

A&A: Anderson, R. S., Anderson, S. P. (2010). Geomorphology: The Mechanics and Chemistry of Landscapes. (n.p.): Cambridge University Press.

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.