

University of Alberta
EAS 205 - Environment Earth
Section A1, Fall 2021

PROFESSOR: Dr. Karlis Muehlenbachs, ESB 3-22, 780-492-2827 (office, but not likely to be answered) so use email:

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OFFICE HOURS: by appointment on Zoom, Mondays and Wednesdays, 13:00 to 14:00.

Lectures: Tues. Thrs., 14:00 to 15:20, *in person*
CCIS L2-190

COVID-19 PANDEMIC DISCLAIMER: University and public health policies and regulations are likely to change several times during the Fall 2021 term. These evolving regulations and policies take precedence over anything published in this syllabus. The instructor will notify students of any pertinent changes by email and in class, but students are ultimately responsible for keeping aware of new and evolving University regulations.

REQUIRED TEXTBOOK: Montgomery, C., Environmental Geology, 11th Edition. Available at the University Bookstore. Used, all older editions are just fine.

Online learning resources:

The textbook publisher provides additional learning resources aimed at facilitating student learning and perhaps including formative assessment tools, are available from the textbook publisher and may be accessed for a fee paid by the student to the third party provide. Students choosing to access and use the online resources should note the following: See attached pamphlet at end of this syllabus for details.

See .pdf file from McGraw-Hill in eClass EAS 205 for details.

1. Registration in the system and any monetary transactions are of your own accord and not the responsibility of the University.
2. Students should be mindful of protecting their personal information and should be aware of how their personal information might be used and/or shared.

Students **MUST NOT** use their @ualberta email address or CCID to register into the system and instead should use a non-identifying email address or account.

Recommended or Optional Learning Resources:

A very influential free, fantastic but older introductory book “How to Build a Habitable Planet”, is of special interest to students with no background in Earth Science, and can be found on:

http://www.ldeo.columbia.edu/~broecker/Home_files/How%20To%20Build%20A%20Habitable%20Planet.pdf

Academic Success Centre: The [Academic Success Centre](#) provides professional academic support to help students strengthen their academic skills and achieve their academic goals. Individual advising, appointments, and group workshops are available year round in the areas of Accessibility, Communication, Learning, and Writing Resources. Modest fees apply for some services.

Course Description: General introduction to interactions between people and their natural environment, with an emphasis on geological processes. Topics include: earthquakes, volcanoes, streams and flooding, mass wasting, coastal processes and shoreline development, soil degradation and erosion, surface water and groundwater resources, water pollution and global change.

My objective is to introduce students from the widest variety of backgrounds to a geological overview of our planet and the major processes that shape and control our environment. Emphasis will be placed on studying geological processes that impinge on individual humans and society at large. My assumption is that the students enrolled in EAS 205 will in the future all become leaders in their respective fields and should first learn how the planet works in sufficient detail so as to make wise political, economic and personal decisions. Current environmental geologic events will be discussed as they arise and will be “fair game” on the exams.

Prerequisite: Any 100-level Science course.

EAS 205 COURSE OUTLINES

- I Introduction (Chapter 1, Appendix A & B)
- II Rocks & Minerals; Plate Tectonics (Chapters 2 & 3, Appendix B)
- III Earthquakes (Chapter 4)
- IV Volcanism (Chapter 5)
- Midterm I (Oct. 5, 2021)
- V Floods (Chapter 6; on dams p 512-518)
- VI Coastal Hazards (Chapter 7)
- VII Landslides & Ground Subsidence (Chapter 8)
- VIII Water Resources & Pollution (Chapters 11 & 17)
- Midterm II (Nov. 16, 2021)
- IX Soils - Resources & Problems (Chapter 12)
- X Waste Disposal, CCUS, (Chapter 16)
- XI “Shale gas & fracking”
- XII Global Climate Change (Chapters 10 & 18)

Expected Learning Outcomes: By the end of this course, you should be able to:

- 1) Explain the Earth as a system, comprising four reservoirs that are coupled to each other, often through the operation of various cycles; briefly explain the essentials of minerals and rocks, including the common and/or distinguishing characteristics of the various types of rocks; outline the internal structure of Earth.
- 2) Explain the fundamentals of plate tectonics, particularly with reference to plate boundaries as a framework for understanding the distribution and types of most earthquake and volcanic activity.
- 3) Explain the origin, measurement, and types of seismic waves involved in earthquakes; enumerate the hazards associated with earthquakes; explain how earthquakes may be predicted/the risk assessed; explain how they may be triggered, prevented, and/or mitigated.
- 4) Explain the types and settings of volcanoes, their products and associated hazards; explain prediction of their activity.
- 5) Define and illustrate the types of mass movements, name and explain the factors that either increase or decrease the likelihood of mass movements, and explain the measures that can be taken to prevent or control them.
- 6) Explain weathering processes and one of their products, namely soils, from the perspectives of structure and influences; explain various problems that affect soils, and what may be done to mitigate those effects.
- 7) Explain the configuration and dynamics of streams, and the process of flooding; explain the effects of flooding, human contribution to flooding, and what measures may be taken to reduce or eliminate its negative impact.
- 8) Explain the processes and forces, including sea level change, that affect coastal zones, especially beaches; explain certain specific problems, and what measures may be taken to address those problems, as well as the limitations or further problems caused by implementing those measures.
- 9) Explain what groundwater is, where it is found and how it moves; characterize different reservoirs; explain water quality; explain various problems or issues related to groundwater, and groundwater management strategies.
- 10) Explain the types of liquid, solid, and radioactive wastes and the factors that must be considered in the various methods for their disposal; explain how they interact with the reservoirs of the Earth System.

11) Explain a few of the more important sources of water pollution and the problems surrounding them; explain some methods of remediation; explain the issues surrounding hydrofracking of hydrocarbon reservoirs.

12) Explain a few other topics relevant to this course, such as asbestos, the petroleum industry, and subsidence.

14) Explain the global occurrence/distribution of the various phenomena discussed in this course (Why do they occur where they do?); explain the connections and common factors between various phenomena covered in this course.

15) Explain how humans/the anthroposphere either are affected by these phenomena, or cause/influence/them.

COURSE MARK-WEIGHT DISTRIBUTION: Exams: Two mid-term (50 min) will be given during the scheduled class time. The final exam (2 hrs.) will be as scheduled by the Registrar. All questions will be multiple choice based on both the assigned reading and lecture material.

First mid-term	25%.	Tues., Oct. 5, 2021
Second mid-term	25%.	Tues., Nov. 16, 2021
Final exam	50%.	TBA

The midterms are not cumulative but the final exam will be cumulative. Students must verify the date and time of the final on BearTracks when the **Final** Exam Schedule is posted.

Representative material regarding evaluation will be posted on the website. Specifics and Application of course material content will be tested via multiple choice questions. All examinations in this course will be given a numerical score. A cumulative course mark will be calculated from those scores, weighted as tabulated above. A final letter grade will be assigned based upon your cumulative mark and my analysis of the class's cumulative mark distribution. Where possible, natural breaks in the cumulative mark distribution will be used in assigning grades, but no pre-determined distribution of grades will be imposed on the class. Your grade will reflect a combination of your absolute achievement and relative standing in the class. In past years, the mean grade in this course has been in the B range. The mean grade this year will be based on my judgment of the overall caliber of this class relative to past cohorts. **Be aware, that a total score of 50% or more in the course as a whole will not ensure a passing grade.** If said score exceeds 50% by virtue of the term work only, whereas lecture final exam results indicate an inability to master the course content to any significant degree, the student may be assigned a failing grade. This **will** occur for anyone whose final exam score is less than 50%, or such other circumstances that may suggest that a passing grade is inappropriate.

Grades are unofficial until approved by the Department and/or Faculty offering the course.

EXAMS: Your student photo I.D. is required at exams to verify your identity. Exams will be administered in the classroom.

MISSED TERM EXAM: A student who cannot write a term examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply to have the weight of the missed midterm transferred to the final. You must notify the instructor of a missed midterm **within 48 hours**. Deferral of term work is a privilege and not a right; there is no guarantee that a deferral will be granted. Misrepresentation of facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

For an excused absence where the cause is religious belief, a student must contact the instructor within two weeks of the start of classes to request accommodation for the term (including the final exam, where relevant). Instructors may request adequate documentation to substantiate the student request.

Deferred Final Examination: A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons (e.g. symptoms consistent with a COVID-19 infection at the time of an in-person exam) can apply for a deferred final examination. Such an application must be made to the student's Faculty office within two working days of the missed examination and must be supported by appropriate documentation or a Statutory Declaration (calendar.ualberta.ca/content.php?catoid=34&navoid=10107#attendance). Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of facts to gain a deferred examination is a serious breach of the Code of Student Behaviour.

Students who are granted permission to sit a *deferred final exam* must do that on:

Deferred exam will be given Saturday, Jan. 15, 2022 from 1000–1200 hours, location TBA.

REEXAMINATION: A student who writes the final examination and fails the course may apply for a reexamination. Reexaminations are rarely granted in the Faculty of Science. These exams are governed by University regulations ([https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#Examinations_\(Exams\)](https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#Examinations_(Exams))) and Faculty of Science regulations (https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#Academic_Standing). Misrepresentation of Facts to gain a re-examination is a serious breach of the *Code of Student Behaviour*.

Student Responsibilities:

Safe and Healthy Learning Environment:

Section 30.3.4(6) c of the Code of Student Behaviour states: “No Student shall create a condition which endangers or potentially endangers or threatens the health, safety or well

being of other persons.” Accordingly, students with symptoms of *any* respiratory illness should avoid attending in-person activities for this class while they feel ill.

Academic Integrity: "The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University."

All forms of academic dishonesty are unacceptable at the University. Any suspected offence will be reported to the Faculty of Science. Anyone who is found in violation of the Code of Student Behaviour may receive a sanction. Typical sanctions include conduct probation, a mark reduction or a mark of 0 on an assessment, a grade reduction or a grade of F in a course, a remark on the transcript, and a recommendation for suspension or expulsion. Students are expected to familiarize themselves with the [Academic Integrity](#) resources (covering the topics of cheating, collaboration, plagiarism, and substantial assistance) on the website of the Office of the Dean of Students.

<https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour.html>

Cell Phones: Cell phones are to be turned off during lectures and exams.

Students Eligible for Accessibility-Related Accommodations: Eligible students have both rights and responsibilities with regard to accessibility-related accommodations. Consequently, scheduling exam accommodations in accordance with [Accessibility Resources](#) deadlines and procedures is essential. Please note adherence to procedures and deadlines is required for U of A to provide accommodations. Contact [Accessibility Resources](#) for further information.

Recording and/or Distribution of Course Materials: Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Learning and Working Environment: The Faculty of Science is committed to ensuring that all students, faculty and staff are able to work and study in an environment that is safe and free from discrimination and harassment. It does not tolerate behaviour that undermines that environment.

If you are experiencing harassment, discrimination, fraud, theft or any other issue and would like to get confidential advice, please contact any of these campus services:

- [Office of Safe Disclosure & Human Rights](#): *A safe, neutral and confidential space to disclose concerns about how the University of Alberta policies, procedures or ethical standards are being applied. They provide strategic advice and referral on matters such as discrimination, harassment, duty to accommodate and wrong-doings. Disclosures can be made in person or online using the [Online Reporting Tool](#).*
- [University of Alberta Protective Services](#): *Peace officers dedicated to ensuring the safety and security of U of A campuses and community. Staff or students can contact UAPS to make a report if they feel unsafe, threatened, or targeted on campus or by another member of the university community.*
- [Office of the Student Ombuds](#): *A confidential and free service that strives to ensure that university processes related to students operate as fairly as possible. They offer information, advice, and support to students, faculty, and staff as they deal with academic, discipline, interpersonal, and financial issues related to student programs.*
- [Office of the Dean of Students](#): *They can assist students in navigating services to ensure they receive appropriate and timely resources. For students who are unsure of the support they may need, are concerned about how to access services on campus, or feel like they may need interim support while you wait to access a service, the Dean of Students office is here to help.*

Feeling Stressed, Anxious, or Upset? It's normal for us to have different mental health experiences throughout the year, particularly as we adjust to returning to campus as we move through a pandemic. Know that there are people who want help. You can reach out to your friends and access a variety of supports available on and off campus at the [Need Help Now](#) webpage or by calling the 24-hour Distress Line: 780-482-4357 (HELP).

Policy about course outlines can be found in [Course Requirements, Evaluations Procedures and Grading](#) of the University Calendar.

Land Acknowledgement: The University of Alberta respectfully acknowledges that we are situated on Treaty 6 territory, traditional lands of First Nations and Métis people.

To learn more about the significance of this land acknowledgement, please read [this](#) useful article and associated links to more information.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus.

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