



## COURSE OUTLINE

### 1. **Course:** GLGY 571, Engineering Geology - Fall 2022

Lecture 01 : TR 08:00 - 09:15 in ST 061

Instructor	Email	Phone	Office	Hours
Dr Brandon Karchewski	brandon.karchewski@ucalgary.ca	403 220-6678	ES 108	By Appointment

#### Teaching Assistants:

Jackson Bodtker, *Email:* jackson.bodtker@ucalgary.ca

Tek Kshetri, *Email:* tek.kshetri@ucalgary.ca

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

#### In Person Delivery Details:

**Lectures:** The lectures will be in-person at the registrar-scheduled time (TuTh 08:00-09:15) in ST 061. You are highly encouraged to attend the in-person class sessions as they will involve interaction/discussion about the content. The in-person class sessions will not be recorded. However, if you need to miss class please follow the procedures outlined by the Undergraduate Science Centre and reach out to the course instructor for advice on how to catch up.

**Labs:** The labs will be in-person once per week (B01: M 08:00-10:50, B02: M 11:00-13:50) in ES 050 beginning Mon Sep 19. There will be 4 lab exercises involving soil and rock testing (see D2L for details and schedule). The remainder of lab time will be used for team-based quizzes and will also provide opportunity to discuss/collaborate on the assignments with your peers and you are highly encouraged to attend. The lab assignments, including instructions on how to submit your assignments, will be uploaded to D2L. As you work through the labs, you are welcome to ask questions of the instructor, TA, and/or your peers during lab sessions or via email. Appropriate collaboration is encouraged, but everyone will submit their own lab assignment.

**Quizzes and Exams:** There will be a series of quizzes completed approximately every 2-3 lab sessions to help you keep up with the course material and encourage team-based learning. These quizzes will be completed first individually and then repeated with open discussion with your lab group. Details will be explained in class and the schedule will be posted to D2L in advance so that you will know when a quiz is occurring during the lab. There will also be a Registrar-scheduled in-person final exam.

**Project/Presentation:** You will also complete an independent study project with your lab group covering a case study and/or field measurement method relevant to the course. Presentations will occur toward the end of the semester, and more information will be provided in class and on D2L during the semester.

#### Re-Entry Protocol for Labs and Classrooms:

To limit the spread of COVID-19 on campus, the University of Calgary has implemented safety measures to ensure the campus is a safe and welcoming space for students, faculty and staff. The most current safety information for campus can be found [here](#).

#### Course Site:

D2L: GLGY 571 L01-(Fall 2022)-Engineering Geology

**Note:** Students must use their U of C account for all course correspondence.

#### Equity Diversity & Inclusion:

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age,

LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

## 2. Requisites:

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

### Prerequisite(s):

Geology 343; and Physics 211 or 221; and Mathematics 267 or 277.

### Calendar Description:

The role of geology in engineering problems. Characterization of rock, rock masses and soil. Mechanical behaviour of geologic material. Investigation methods and case histories.

### Course Learning Objectives:

By the end of this course, students should be able to:

1. **Describe** the physical and mechanical properties of soils and rock relevant to engineering classification of these materials.
2. **Explain** the concept of effective stress and its importance to the deformation and strength of soil and rock.
3. **Compare and contrast** criteria used to describe the strength of soil and rock, with particular regard to the influence of fabric and rock mass characteristics.
4. **Describe and perform** laboratory tests for physical and mechanical properties of soil and rock.
5. **Describe** in situ methods of evaluating the properties of soil and rock.
6. **Communicate** the results of geotechnical calculations and laboratory investigations to peers in the geoscience and geotechnical engineering community.

## 3. Grading:

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Quizzes	20%	Ongoing		
Labs/Assignments	40%	Ongoing		
Project/Presentation	10%	Dec 01 2022		
Registrar Scheduled Final Exam	30%	Will be available when the final exam schedule is released by the Registrar	in person	Will be available when the final exam schedule is released by the Registrar

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	95 %	90 %	85 %	80%	75%	70 %	65 %	62%	60%	55 %	50 %

This course will have a Registrar Scheduled Final exam that will be delivered in-person and on campus. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

## 4. Missed Components Of Term Work:

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, one possible arrangement is that the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course. This option is at the discretion of the coordinator and may not be a viable option based on the design of this course.

#### 5. **Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

Some lab work may require visiting the lab room ES 050 outside of regular scheduled lab time to complete measurements. Such lab time will be supervised by a course instructor/TA and/or lab technician. Details will be provided in the lab description, when relevant, and scheduled times will be arranged to accommodate students' schedules to avoid conflicts with other courses.

#### 6. **Course Materials:**

Recommended Textbook(s):

Luis Gonzalez de Vallejo, Mercedes Ferrer, *Geological Engineering*: CRC Press, 2011.

The textbook listed above provides a good general reference that covers both soil mechanics and rock mechanics. It is not essential to have a copy of this (or any) textbook to succeed in the course. Course notes will be provided by the instructor, and any tables/charts that are critical to coursework will be provided via D2L.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

#### 7. **Examination Policy:**

All exams and quizzes are "open book". During an exam or quiz, you may consult any course materials including notes and previous exams or quizzes *which you have made yourself*. You may not consult exams or quizzes from previous years during a quiz or exam. You may access the internet, but you may not use email or other forms of communication (written, verbal, electronic) except to communicate with the course instructor or TAs during an examination (this does not apply to team-based quizzes). The use of calculators or computers for computation is encouraged; a scientific calculator such as the Casio fx-991 or one with similar functionality is recommended and use of spreadsheet tools such as MS Excel is allowed.

Students should also read the Calendar, [Section G](#), on Examinations.

#### 8. **Approved Mandatory And Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course.

#### 9. **Writing Across The Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

#### 10. **Human Studies Statement:**

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

#### 11. **Reappraisal Of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request

a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work [form](#) to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see their [website](#) or call [403-210-9355](#).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([syva@ucalgary.ca](mailto:syva@ucalgary.ca)) or phone at [403-220-2208](#). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)  
[Student Academic Misconduct Policy](#) and [Procedure](#)  
[Faculty of Science Academic Misconduct Process](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

### e. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Jennifer Cuthbertson by email [cuthberj@ucalgary.ca](mailto:cuthberj@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see [Legal Services](#) website.
- g. **Student Union Information:** [SU contact](#), Email SU Science Rep: [sciencerep1@su.ucalgary.ca](mailto:sciencerep1@su.ucalgary.ca), [Student Ombudsman](#)
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

**Course Outcomes:**

- Students should be able to classify soils
- Students should be able to describe rock masses in an engineering geology context.
- Students should be able to apply the concepts of pore pressure and effective stress to engineering geology problems
- Students should be able to apply the Mohr circle and Mohr Coulomb failure envelope to stress and failure problems
- Students should be able to outline the steps in a site investigation
- Students should be able to select appropriate measurement and analytical technique for engineering geology studies.

Electronically Approved - Sep 01 2022 12:44

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**Department Approval**