

Earth Sciences 2281b - Winter 2025 Course Outline

1. Course Information

Earth Science 2281B - Geology for Engineers

Schedule: Tuesday's – lectures 10:30 a.m. – 12:20 p.m. ; labs - lab 002 Tues. 12:30 –2:20 p.m., lab 003 Tues. 2:30 – 4:20 p.m., lab 004 Wed. 10:30 a.m. – 12:20 p.m.

Note: Attendance will be taken at all labs to ensure students are attending the lab they are registered in.

Prerequisites: Registered in second, third, or fourth year Civil and Environmental Engineering or permission of department

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) to enroll in it, you may be removed from this course, and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructor: Rob Schincariol, Ph.D., P.Geo.

519-661-2111, ext. 83732, schincar@uwo.ca

Office Hours by appointment – email and a time will be arranged that meets both our schedules.

Graduate Teaching Assistants (GTA's): TBA

Note: Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

3. Course Syllabus, Schedule, Delivery Mode

Description: Introduction to physical geology with emphasis on the engineering-oriented aspects of the Earth Sciences. Topics include: minerals and rocks; mass movements; interpretation of aerial photographs, topographic and geologic maps; surficial processes and their manifestations; surface and ground water; structural geology and subsurface processes; and earth resources. 2 lecture hours, 2 lab hours (0.5 course)

Learning Outcomes

Upon successful completion of this course students will be able to:

- Identify major minerals, igneous, sedimentary, and metamorphic rocks through laboratory-based assessment.
- Perform selected engineering geology evaluations and identify typical weathering products within engineering materials.
- Apply knowledge of Earth dynamics and structural geology to assess relative risks of earthquake activity and the impact on engineering structures.
- Apply knowledge of mass wasting processes and weathering to assess the mechanics of slope movements, slope stability processes and risks.
- Explain surface and ground water flow dynamics with respect to effective water resource management and subsurface characterization within fluvial plains and coastal areas.
- Identify features of glacial deposits on topographic maps, air photos, and other imagery.
- Explain how glacial cycles create complex subsurface deposits which impact ground water flow and geotechnical evaluations.
- Create links between Canada's resource rich economy, including oil, gas, and mineral deposits, and geologic processes.
- Effectively communicate the nature of dynamic earth processes and relative risks associated with various engineering works.

Detailed Schedule

Note – Answers will be posted for the lab assignments on Owl. No lab assignments will be graded. All lab marks derive from the lab exams.

Jan. 07	lecture 1
Jan. 14	lecture 2; lab 1 assigned
Jan. 21	lecture 3; lab 2 assigned
Jan. 28	lecture 4; lab 3 assigned
Feb. 04	lecture test 1, Lectures 1, 2, 3 and 4; no lab
Feb. 11	lecture 5; lab 4 assigned
Feb. 25	lecture 6; Practical lab test 1 (labs 1 to 3).
Mar. 04	lecture 7; lab 5 assigned
Mar. 11	lecture test 2, Lectures 5, 6, and 7; no lab
Mar. 18	lecture 8; lab 6 assigned
Mar. 25	lecture 9; lab 7 assigned
Apr. 01	No lecture (if required Practical Lab test 1 makeup test will run during normal lecture period); Practical lab test 2 (labs 4, 5, 6, and 7 plus relevant lecture material from lectures 8 and 9 as they relate directly to the labs. See subsection information above for your time slot.

Lecture slides on Owl are titled according to topic, not lecture numbers, as certain topics may bridge two lectures. So, you may view the lectures ahead of time in relevant order the lecture plan calls for addressing the various topics in the following order:

Intro → Minerals → Igneous → Metamorphic → Sedimentary → Geologic Time → Weathering → Mass Wasting → Geologic Structures → Earthquakes → Resources → Surface Water → Groundwater → Coastal → Glaciers

Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

4. Course Materials

Text: Introductory Physical Geology Laboratory Manual – First Canadian Edition (v3 – Jan 2020), *McBeth, Panchuk, Prokopiuk, Hauber, Lacey*.

Available free at <https://openpress.usask.ca/geolmanual/>

This manual is a subset Canadian version of the following Open Textbook lab manual:
Laboratory Manual for Introductory Geology, 2015, *Deline, Harris, Tefend*, University System of Georgia, University Press of North Georgia, ISBN 978-1-940771-36-6. Available free at <https://oer.galileo.usg.edu/geo-textbooks/1/>

For the map exercises, you will require a millimeter ruler, coloured pencils, protractor, and calculator, and the lab manual.

Students should check OWL <https://westernu.brightspace.com/d2l/login> on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

The main purpose of the lectures is to help you understand how Earth Sciences and Civil Engineering are

linked. Case studies / consulting reports give you the real-world application demonstrating these links.

All course material will be posted to OWL <https://westernu.brightspace.com/d21/login>

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements – A stable internet connection, computer with working microphone and webcam, ability to print in colour or work off of a tablet type computer, scanner or camera (cell phone is fine).

5. Methods of Evaluation

	<i>Option 1</i>	<i>Option 2</i>	<i>Date</i>	<i>Makeup Date for those granted Accommodation</i>
Test 1*	34 %	32%	Feb. 04	Feb. 11 at 1:30 p.m.
Test 2*	34 %	32%	Mar. 11	Mar. 18 at 1:30 p.m.
Practical Lab Test 1**	16%	18%	Feb. 25	Apr. 01 at 10:30 p.m.
Practical Lab Test 2**	16%	18%	Apr. 01	May 09 at 1:00 p.m.

NO FINAL EXAM

* Tests will be ‘closed book’. No aids permitted other than basic non-memory calculator, pencils / pen, ruler, protractor. Cell phones must remain silenced and in bags / backpacks. You are strongly encouraged to attend all lectures and take notes. Tests focus on material discussed in class within certain contexts. If you miss lectures you will not understand how to answer the test questions properly.

** For Practical Lab Test 1 – ONE normal sheet of paper (216 x 279 mm; both sides) of your own notes can help with mineral / rock identification. ALSO note that Practical Lab Test 1 is a **timed sample ID test** where rock and mineral samples are identified within the lab facilities. There will be 25 samples and you will have 2 minutes per sample. As this is a timed lab test, which requires specialized lab facilities, **no separate ‘accommodated’ exams are allowed for** (NOTE. Accessible Education / Office of the Registrar has granted this practical lab test an exemption). If you miss this test due to illness, self-reported absence, or other valid reason, there will be one re-write of this test scheduled on April 01 during the normal lecture time slot. No mark redistribution will be allowed for Lab Test 1. Any subsequent approved re-write of Lab Test 1 will take place during the next regularly scheduled course offering (i.e. next academic year).

Final grades will be calculated using Option 1 and Option 2, with the higher of the two grades being assigned.

COURSE GRADING

Marks are assigned to elements that were discussed in class and/or are on the Owl site (lecture slides, resources, lab material). When evaluating an answer, we do not just evaluate the correct statements, but also the incorrect statements. Often a student will state many elements we are looking for, but then will lose marks for making statements that show they do not fully understand the issue at hand.

I have no problem remarking a test. However, I will remark the entire test, all sections, and questions. Students often look at where they think additional marks are due, and not where they were given more marks than warranted. Marking errors or inconsistencies work both ways. As such if I remark a test the student should be aware that their grade may go up or down.

6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

7. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

8. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

No electronic devices are permitted on tests.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for

such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

9. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.