Civil Engineering
CIVENG 2J03
Engineering Geology
Winter 2026

McMaster University
ENGINEERING

Instructor Information



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Office Hours:
TBD

TA Information

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Name: Mariana Teixeira
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Class Times

Lecture	We, Fr	10.30 am - 11.20 am
Lab L01	Tu	8.30 am - 11.20 am
Lab L02	Th	8.30 am - 11.20 am

Tutorial T01	We	2.30 pm - 4.20 pm
Tutorial T02	We	2.30 pm - 4.20 pm

Class Format

In Person

The objective of this course is to introduce students to geological materials and phenomena that influence engineering and land use decisions, as well as to develop a deeper understanding of earth processes that affect society and infrastructure. Lectures and related discussions will cover the fundamental topics of engineering properties of rock and soil surficial materials and their significance for civil work projects and natural and engineered geological processes. Students are expected to be fully engaged in learning engineering geology during contact hours, demonstrating active participation and maintaining a professional demeanour. Tutorials will be devoted to reinforcing key concepts from lectures and collaborating on term projects. In-person attendance is required for this course.

Course Dates: 01/05/2026 - 04/07/2026
Units: 3.00
Course Delivery Mode: In Person
Course Description: Fundamentals of engineering geology; earth structure and rock types; geological structures; earth surface processes; engineering properties and behaviour of soils and rocks; fundamentals of groundwater conditions, flow, and monitoring; geological material used in construction; subsurface exploration and site investigation. Two lectures, one tutorial (two hours), one lab (three hours); second term Prerequisite(s): Registration in Level II or above Engineering or permission of the Department Antirequisite(s): CIVENG 2J04

Instructor-Specific Course Information

Course materials: All course materials will be made available on Avenue to Learn (A2L) prior to the scheduled class. Students are expected to attend lectures and take their own notes. To support effective learning, students should review the posted materials in advance and actively engage during lectures.

Attendance: Attendance at lectures and tutorials is strongly encouraged, but it will not be reflected in the grading assessment. Students must notify the instructor of any scheduled absences for sports or other activities during the first two weeks. This early notification

allows for adequate time to make necessary arrangements for makeup work as deemed feasible.

Homework Assignments and Quizzes: These are designed to reinforce your understanding of the class material, with problems that mirror the typical expectations for exam questions. These assessments also serve as examples of the instructor's testing style and provide practice problems. It is important to note that they should not be interpreted as a guarantee that you will be tested on the same problems during exams. The instructor formulates fresh exam questions that might have some overlap with these assessments.

Term Project: Students will select a case study or topic that integrates geology and civil engineering, demonstrating how geology is used by engineers to solve practical societal problems. The project will involve analyzing data, constructing figures, working in groups, and preparing a report and presentation — skills that you will be expected to use as engineers. Each group, consisting of three to four students, will present their research findings during the last tutorial of the semester and submit a final project report. More details about this assignment will be provided a few weeks into the term.

Important Links

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations
- McMaster University Library
- eReserves

Course Learning Outcomes

- Gain an appreciation for the role of geology in shaping engineering systems and understand its relevance to and influence on engineering decisions
- Develop a fundamental understanding of earth systems, geological structures, surface and subsurface geologic processes and hazards, and their implications

for society and infrastructure

- Understand the basic principles of mineral, rock and soil classification, and how their properties impact surface and groundwater flow

- Develop insights into geological materials used in construction, including their properties, and explore geotechnical considerations necessary for successful engineering projects

Graduate Attributes

The Canadian Engineering Accreditation Board (CEAB) is a division of Engineers Canada and is responsible for accrediting undergraduate engineering programs across Canada. Accreditation by the CEAB ensures that the engineering programs meet a national standard of quality and cover essential educational requirements. Graduate Attributes are a set of qualities and skills that the CEAB expects engineering graduates to possess. These attributes are a benchmark for the learning outcomes of accredited engineering programs. This section lists the Graduate Attribute Indicators associated with the Learning Outcomes in this course.

- Indicator 1.2: Competence in Natural Sciences

  (Course Learning Outcomes 1 and 2)

- Indicator 2.1: Identifies and states reasonable assumptions and suitable engineering fundamentals before proposing a solution path to a problem.

  (Course Learning Outcome 2)

- Indicator 9.1: Evaluates the environmental impact of engineering activities, identifies uncertainties in decisions, and promotes sustainable design.

  (Course Learning Outcomes 3 and 4)

- Indicator 9.2: Evaluates the social impact of engineering activities, including health, safety, legal, cultural, and other relevant factors, and identifies uncertainties in decisions.

(Course Learning Outcome 2)

Lab Information

Attendance at rock, mineral, and soil classification laboratory sessions is mandatory to pass this course. Lab reports cannot be submitted without participating in the corresponding lab session. If you miss a session, you must contact the instructor or teaching assistants **within one week** to arrange a reschedule. Lab reports, **due within two weeks of completing the session**, require equal contributions from all group members to receive full marks. There will be **three self-paced virtual activities**, each consisting of pre-lab reading and an associated quiz. These activities must be completed *within the allocated lab period*. Failure to complete the required activities will result in denial of access to the laboratory.

Lab Safety

The Faculty of Engineering is committed to McMaster University's Workplace and Environmental Health and Safety Policy which states: "Students are required by University policy to comply with all University health, safety and environmental programs". It is your responsibility to understand McMaster University Workplace and Environmental Health and Safety programs and policies. For information on these programs and policies please refer to McMaster University Health and Safety. The Lab Safety Handbook is available here, as well as on A2L.

It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for some of the experiments and the laboratory equipment. The first lab session will be a self-paced safety orientation to JHE 114 with the safety requirements listed below. Students not abiding by these safety requirements will be given one warning. Second offences will result in the student being asked to vacate the laboratory and receiving a grade of zero for that particular lab.

- Glasses or safety glasses/goggles must be worn when conducting experiments in the lab.
- Contact lenses are not to be worn in the lab.

- No short (i.e., above-the-knee) pants or skirts are permitted in the lab – lab coats must be worn over top of your clothing in these instances.
- Closed-toe shoes only.
- Loose clothing is not permitted in the lab, and long hair must be tied back.
- Samples in the drying oven are probably HOT. Please use gloves when placing or removing items.
- The weak HCl solution used for rock identification should be used with appropriate PPE (safety glasses). Hands should be washed thoroughly after use.

Course Schedule

A weekly breakdown of the course schedule

Week	Topic	Assessment
1	Introduction to Engineering Geology and Earth Structure	
2	Earth systems and plate tectonics	Quiz 1, Homework 1
3	Rock-Forming matters, minerals and classification	Quiz 2
4	Rock cycle, types, and formation; Geological materials used in construction	Quiz 3, Homework 2
5		Quiz 4
6	Geological structural deformation and discontinuity	Quiz 5, Homework 3
Midterm Break		
7	Earthquake and seismology	Quiz 6
8	Surface processes: weathering and soil formation	Midterm Exam
9	Surface processes: mass movement and geomorphological processes	Quiz 7, Homework 4
10	Rock and soil characteristics and behaviour	Quiz 8
11		Quiz 9, Homework 5
12	Surface water hydrology, Groundwater Systems and site investigation	Quiz 10
13	Course Review and Project Presentations	

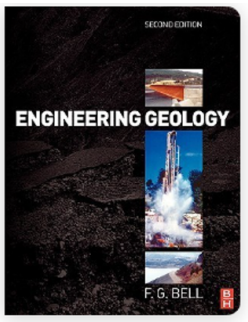
Required Materials and Texts

Please sign in with your MacID here to view your booklist

There are no required materials and texts.

Optional Course Materials

Please sign in with your MacID here to view your booklist



Engineering Geology
ISBN: 978-0750680776
Authors: F. G. Bell
Publisher: Elsevier
Publication Date: 2007
Edition: Second Edition
Students are encouraged to refer to this textbook for independent study and as a complement to the lecture notes.



Geology for Engineers and Environmental Scientists
ISBN: 978-1-292-03910-7, 1-292-03910-8
Authors: Alan E. Kehew
Publisher: Pearson
Publication Date: 2014
Edition: Third Edition
Students are encouraged to refer to this textbook for independent study and as a complement to the lecture notes.

Course Evaluation

Component	Weighting
Homework	7%
Quiz	18%
Lab	10%

Component	Weighting
Midterm Exam	25%
Term Project	10%
Final Exam	30%

Course Evaluation Details

- Active participation in class activities and discussions can earn bonus marks.
- Homework assignments are the only optional component. All submissions must be handwritten and based on the content taught in the lecture. If not completed, their weight will automatically be transferred to the final exam. If completed, full credit will be awarded for each submission, with the **top four (4) out of five (5)** submissions contributing to the final grade.
- There will be ten **(10) in-class quizzes** throughout the term, with the **top six (6)** contributing to the final grade.
- If you fail to complete pre-lab activities, you will be denied access to the lab. In addition, if you miss a lab session or fail to submit lab reports, you will receive an **F grade**.
- Without valid justification and supporting documentation, other missed assessments will receive a zero grade.
- Lab reports must be completed in groups of two, with equal contributions from each student required to earn credit.
- Term project reports and presentations must be completed in groups of three or four, with equal contributions from each student required to earn credit.
- There will be **one midterm** and **one final exam**. The McMaster Standard Calculator must be used during examinations. Students may bring one crib sheet (letter size, double-sided). Each exam will cover **all material to date**, including lab content, homework assignments, quizzes, classroom notes, and tutorial readings.
- The final exam is scheduled during the regular University Final Examination period established by the Registrar's Office.

Undergraduate Grading Scale

The McMaster 12 Point Grading Scale

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

Late Assignments

It is the student's responsibility to regularly attend class or check A2L for updates and announcements. For assignments, lab reports, and term project reports, late submissions without approved extensions will incur a 20% penalty per day. A grace period of 24 hours after the set deadline is given, but any submission made a minute past this 24-hour timeframe will be considered a day late.

Absences, Missed Work, Illness

- If you miss any assessment for any reason, you must contact the instructor **within 48 hours** of the assessment and notify the instructor of your McMaster Student Absence Form (MSAF) (see Section "APPROVED ADVISORY STATEMENTS" below for further details). Otherwise, your MSAF will not be accepted.
- When a self-reporting relief is submitted for missed assessments, the deadlines will be extended by the absence period listed in the submitted MSAF, starting from the

original listed deadline. It is your responsibility to notify the instructor of your MSAF submission.

- For group assessment submissions, such as *lab reports* and *term project reports/presentations*, MSAFs will not be accepted.

Generative AI: Some Use Permitted

Students may use generative AI in this course in accordance with the guidelines outlined for each assessment, and so long as the use of generative AI is referenced and cited following citation instructions given in the syllabus. Use of generative AI outside assessment guidelines or without citation will constitute academic dishonesty. It is the student's responsibility to be clear on the limitations for use for each assessment and to be clear on the expectations for citation and reference and to do so appropriately.

Turnitin.com

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

APPROVED ADVISORY STATEMENTS

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and

academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. Avenue to Learn, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

Courses with an On-line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn, LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Requests for Relief for Missed Academic Term Work

In the event of an absence for medical or other reasons, students should review and follow the Policy on Requests for Relief for Missed Academic Term Work.

Academic Accommodation for Religious, Indigenous, or Spiritual Observances (RISO)

Students requiring academic accommodation based on religious, Indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware

that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, Avenue to Learn and/or McMaster email.