

COURSE INFORMATION

Course Name: Principles of Geological & Geo-Environmental Engineering Course Code: CIV ENG 2J04

Session Offered: Winter 2021

Calendar Description: 4 units - Principles of geological engineering and hydrologic engineering; Composition of 'earth'; processes that operate on or beneath the surface; fundamentals of: groundwater flow, monitoring, and sampling, contaminant movement in aquifers, solid waste management, hazardous waste management and remediation. Three lectures, one tutorial or one lab; Second term. **Prerequisite(s):** Credit or registration in CIVENG 2B04; **Antirequisite(s):** ENVIRSC 3U03.

Instructor(s): Dr. Paulin Coulibaly

Phone: 905.525.9140 x 23354

Email: couliba@mcmaster.ca

Office Hours/Contact: TBD

Class Schedule Day(s): TuThFr

Time: 11.30AM - 12:20PM

Location: Virtual

1. COURSE OBJECTIVES

The goals of this course are to develop a fundamental understanding of the principles of geological and geo-environmental engineering.

Lectures and related discussion will cover the topics of ecosystem fundamentals, ecosystem and sustainability, soil-based ecosystems, minerals and rocks, soil classification, seismology and earthquakes, surface water fundamentals, sediment and nutrient control, water use and land management, solid waste management, air pollution and human health, groundwater flow and monitoring, contaminants transport in aquifers, site remediation, land use and ecosystem impacts, and development of increasingly sustainable communities.

2. COURSE SPECIFIC POLICIES

The course topics will be presented in common lecture format online, with emphasis on developing active learning and scientific inquiry competency. Students are expected to attend online and actively participate in the lectures and tutorial sessions. Tutorial will review, discuss, and practice key principles and concepts presented in the core lectures.

Lecture notes will be made available on Avenue to Learn one week ahead of lecture.

Late submissions will not be accepted and the submitted materials will not be graded.

If a student submits a MSAF, the marks assigned to the missed work will be redistributed to other element(s) in the assessment category (e.g. assignments, project chapter, exam).

3. SCHEDULE

WEEK 1	Introduction; Ecosystems: Structure & Sustainability	
WEEK 2	Soil Ecosystem; Minerals and Rocks	Baseline Assignment
WEEK 3	Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks	Assignment # 1
WEEK 4	Seismology and Earthquake	Assignment # 2
WEEK 5	Soil classification; Hydrology: Principles	Assignment # 3
WEEK 6	Reading Week	
WEEK 7	Engineering Hydrology; Evaporation & Infiltration Estimation	Assignment # 4
WEEK 8	Water Pollution & Prevention	

WEEK 9	Solid Waste & Management; Air Pollution	
WEEK 10	Aquifers & Groundwater Flow; Groundwater Monitoring	
WEEK 11	Contaminant Transport in Aquifers; Boreholes & Wells	
WEEK 12	Site Remediation	Lab Report
WEEK 13	Geo-Environmental Impact Assessment; Revision	Term Project Report
FINAL EXAMINATION	Scheduled during the regular University Final Examination period established by the Registrar's Office	

4. ASSESSMENT OF LEARNING		WEIGHT %
Assignments & Labs		20%
Term Project		15%
Midterm Exam		25%
Final Exam		40%
Total		100%

5. LEARNING OUTCOMES
<p>Upon completion of CE-2J04, the students will have a good understanding of:</p> <ul style="list-style-type: none"> Principles of geological and geo-environmental engineering; (GA 1.2) Environmental ecosystems and the processes which sustain them; (GA 1.2) Basic interrelationships that exist between the environment, humans and other living species; (GA 9.1) Fundamentals of geology (mineral and rocks) and seismology/earthquake; (GA 1.2) Surface water (hydrology), groundwater flow, monitoring wells and contaminants transport; (GA 1.2) Solid waste management, hazardous waste management, and site remediation; (GA 9.1) Air pollution and global atmospheric change, and impact on human health; (GA 9.1) Actions which can be incorporated into the Engineering Profession and daily activities of individuals to solve geo-environmental problems and help curtail current and potential environmental impacts. (GA 1.2, 9.1) <p>The design project will focus on the integration of a number of sustainability design principles.</p> <ul style="list-style-type: none"> Student groups will be required to prepare and submit a professional final report. (GA 9.1) <p>The Labs will be on Soil Classification using: Hydrometer Method and Atterberg Limits.</p>

6. COMMUNICATIONS
<p>It is the student's responsibility to:</p> <ul style="list-style-type: none"> Maintain current contact information with the University, including address, phone numbers, and emergency contact information. Use the University provided e-mail address or maintain a valid forwarding e-mail address. Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their "@mcmaster.ca" alias. Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias. Check the McMaster/Avenue email and course websites on a regular basis during the term.

7. POLICIES

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](https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/), located at <https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/>.

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 DETECTION

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.

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), 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

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

The McMaster Student Absence Form is a self-reporting tool for **Undergraduate Students** to report absences that last up to 5 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period. You may submit a maximum of 1 Academic Work Missed requests per term. It is **your** responsibility to follow up with your Instructor immediately regarding the nature of the accommodation. If you are absent more than 5 days or exceed 1 request per term you **must** visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation. This form should be filled out immediately when you are about to return to class after your absence.

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.

PROTECTION OF PRIVACY ACT (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades, and all other personal information at all times. For example, the submission and return of assignments and the posting of grades must be done in a manner that ensures confidentiality – see <http://www.mcmaster.ca/univsec/fippa/fippa.cfm>.

ANTI-DISCRIMINATION

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer, or the Human Rights Consultant, as soon as possible.

https://www.mcmaster.ca/policy/General/HR/Discrimination_and_Harassment.pdf

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, A2L and/or McMaster email.

8. MCMASTER 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