Civil Engineering
CIVENG 3A03
Geotechnical Engineering I
Fall 2023

McMaster University
ENGINEERING

Instructor Information

Ahmed Fahmy
Email: fahmya5@mcmaster.ca
Office Hours:
By Appointment

Course Information

Lectures: Th 2:30PM - 4:20PM
Labs: Mo 8:30AM - 11:20AM (L01) - Tu 2:30PM - 5:20PM (L02)
Tutorials: Fr 8:30AM - 10:20AM (T01) - We 10:30AM - 12:20PM (T02)

Course Dates: 09/05/2023 - 12/06/2023
Units: 3.00
Course Delivery Mode: In Person
Course Description: Composition of soils, soil identification and classification; compaction; seepage theory; effective stress concept; stresses and displacements using elastic solutions; consolidation theory; numerical solutions. Two lectures, one tutorial (two hours), one lab (three hours); first term Prerequisite(s): CIVENG 2J03

Important Links

- Mosaic
- Avenue to Learn
- Student Accessibility Services - Accommodations

- McMaster University Library
- eReserves

Course Learning Outcomes

For accreditation reasons, these learning outcome statements must be tied back to CEAB graduate attributes (GAs), including those that are measured in this course. If you are unsure how to do this, please contact the Associate Chair Undergraduate in your department.

- To understand the physical and mechanical behaviour of soil under various natural and imposed loading conditions
- To identify/employ techniques, based on fundamental notions of mechanics, to analyze stress and seepage in soil as well as soil deformation under various conditions
- To solve problems using different methods by making proper assumptions/ simplifications, based on the fundamentals

Required Materials and Texts

Textbook Listing: https://textbooks.mcmaster.ca

Fundamentals of Geotechnical Engineering
Authors: BM Das
Publisher: Cengage Learning
Publication Date: 2013
Purchase not necessary

Optional Course Materials

Textbook Listing: https://textbooks.mcmaster.ca

Craig's Soil Mechanics
Authors: Knappett, J. and Craig, R.F.
Publisher: CRC Press
Publication Date: 2012

Soil Mechanics and Foundations
Authors: Budhu, M
Publisher: John Wiley & Sons
Publication Date: 2010

Class Format

In Person

Course Evaluation

Laboratory reports: 20%

Assignments: 20%

Mid-term exam: 20%

Final exam: 40%

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

Grade	Equivalent Grade Point	Equivalent Percentages
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49

Course Schedule

Week 1 - Introduction - Soil origin, grain size, and shape

Week 2 - Weight volume relations

Week 3 - Soil plasticity and classification

Week 4 - Soil compaction

Week 5 - Hydraulic conductivity

Week 6 - No classes

Week 7 - Midterm exam

Week 8 - Hydraulic conductivity and seepage

Week 9 - Stresses in soil mass

Week 10 - Compressibility and consolidation

Week 11 - Compressibility and consolidation

Week 12 - Intro to subsurface investigation

Week 13 - Intro to ground improvement

Week 14 - Review session

Laboratory Overview, Operation, and 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 and policies". It is your responsibility to understand McMaster University's Risk Management system, which is supported by a collection of Risk Management Manuals (RMMs) that contain programs and policies in support of the Risk Management System. The RMMs are available from https://hr.mcmaster.ca/employees/health_safety_well-being/our-safety/risk-management-manuals-rmms/.

It is also your responsibility to follow any specific Standard Operating Procedures (SOPs) provided for specific experiments (see course lab manuals) and the laboratory equipment **[https://www.eng.mcmaster.ca/sites/default/files/civil_lab_health_and_safety_manual.pdf]**.

The safety requirements for [redacted] are 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 in the lab at all times.

• 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 must be worn at all times.

• No loose clothing is allowed.

• Long hair must be tied back.

• Disposable latex or nitrile gloves must be worn when working with hazardous chemicals.

• Heat resistant gloves must be worn when removing hot items from the drying oven (as indicated by the laboratory

instructor).

• Dust masks must be worn (as indicated by the laboratory instructor).

• Hearing protection must be worn (as indicated by the laboratory instructor).

Additionally, McMaster University's workplace health and safety guidance related to COVID-19 must always be followed (available from https://hr.mcmaster.ca/resources/covid19/workplace-health-and-safety-guidance-during-covid-19/).

Attendance of all laboratory sessions is required to pass the course.

Late Assignments

Late assignments and lab reports will be penalized by 10% of their mark per day late. No assignments or lab reports will be accepted later than 4 days of the posted deadline.

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.

Generative AI: Use Prohibited

Students are not permitted to use generative AI in this course. In alignment with McMaster academic integrity policy, it "shall be an offence knowingly to … submit

academic work for assessment that was purchased or acquired from another source". This includes work created by generative AI tools. Also state in the policy is the following, "Contract Cheating is the act of "outsourcing of student work to third parties" (Lancaster & Clarke, 2016, p. 639) with or without payment." Using Generative AI tools is a form of contract cheating. Charges of academic dishonesty will be brought forward to the Office of Academic Integrity.

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, located at https://secretariat.mcmaster.ca/university-policies-proceduresguidelines/

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.

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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.

Academic Advising

For any academic inquires please reach out to the Office of the Associate Dean (Academic) in Engineering located in JHE-Hatch 301.

Details on academic supports and contact information are available from:

https://www.eng.mcmaster.ca/programs/academic-advising

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.