

COURSE NAME: CIV310 Applied Soil Mechanics

Credit Value: 4
Total Course Hours: 56
Prerequisite Course(s): CIV205
Corequisite Course(s): None

COURSE DESCRIPTION

CIV310 will explore the fundamental engineering properties of soils and how they relate to the field of civil engineering. This course will include a series of lectures, laboratory assignments and self study project work. Participants will learn about stress-strain behaviour and hydraulic conductivity of soils from in-situ and laboratory testing techniques. Students will be introduced to foundation design, slope stability and seepage analyses techniques. Case studies will be presented and the students will learn how to apply basic soil mechanics theory to solve typical practical engineering problems that are often associated with civil engineering projects. Field Trips will be conducted to different project sites to expose the students to real world situations. Upon completion of this course, students are expected to be able to identify potential engineering problems related to soils, develop an appropriate investigation and laboratory testing program to gather the required data, and be familiar with appropriate design and analyses techniques to ensure a successful outcome.

LAND ACKNOWLEDGEMENT

Canadore College resides on the traditional territory of the Anishinaabeg and within lands protected by the Robinson Huron Treaty of 1850. This land is occupied by the people of Nipissing First Nation since time immemorial.

PLAR INFORMATION

This course is eligible for Prior Learning Assessment and Recognition. Students are advised to discuss options with their program coordinator.

COURSE LEARNING OUTCOMES

Upon completion of this course, the student will have reliably demonstrated the ability to:

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| 1.0 Understand Stress-Strain behaviour of soils
including: <ul style="list-style-type: none">1.1 Shear stress measurement and typical values for different soils .1.2 Settlement and Consolidation of soils related to different loading situations.1.3 Relevance of geological origin and types of soils to anticipated strength and strain properties. | engineering problems including: <ul style="list-style-type: none">3.1 Determination of soil parameters for engineering design.3.2 Review and determination of suitable shallow foundation design.3.3 Review and selection of appropriate deep foundation techniques. |
| 2.0 Understand hydraulic conductivity of soils
including: <ul style="list-style-type: none">2.1 Field and lab testing techniques to measure hydraulic conductivity.2.2 Relevance of hydraulic conductivity to various project construction conditions.2.3 Analyses techniques to estimate seepage flow rates. | 4.0 Understand and analyze slope stability
including: <ul style="list-style-type: none">4.1 Review and analysis of natural slopes.4.2 Review and analysis of constructed embankments.4.3 Identification of critical failure modes and types. |
| 3.0 Understand and analyze foundation | 5.0 Manage, reduce and present collected soils data using appropriate software and techniques
including: <ul style="list-style-type: none">5.1 Development of site investigation logs. |

5.2 Summarize and complete basic statistical summary of soils data.

5.3 Select appropriate design parameters for use in design analyses.

GENERAL EDUCATION

This is not a General Education course.

PROGRAM OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved program learning outcomes (PLO):

Civil Engineering Technology

2. Comply with workplace health and safety practices and procedures in accordance with current legislation and regulations.
3. Complete duties and monitor that work is performed in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the civil engineering field.
4. Promote and carry out sustainable practices in accordance with contract documents, industry standards and environmental legislative requirements.
5. Facilitate the collaboration and interaction among the project team and project stakeholders to support civil engineering projects.
6. Collect, process, analyze and coordinate technical data to produce written and graphical project-related documents.
8. Participate in the design and modeling phase of civil engineering projects by applying engineering concepts, technical mathematics and principles of science to the review, production and/or modification of project plans.
9. Contribute to the scheduling and coordination and cost estimation of civil engineering projects and monitor their progression by applying principles of construction project management.
10. Coordinate and perform quality control testing and evaluate equipment, materials and methods used in the implementation and completion of civil engineering projects.
11. Apply teamwork, leadership, supervision and interpersonal skills when working individually or within multidisciplinary teams to complete civil engineering projects.

ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved essential employability skills (EES) outcomes:

1. Communicate clearly, concisely, and correctly in the written, spoken, and visual form that fulfils the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
8. Show respect for the diverse opinions, values, belief systems, and contributions of others.
9. Interact with others in groups or teams in ways that contribute to effective working relationships and the

achievement of goals.

10. Manage the use of time and other resources to complete projects.

11. Take responsibility for one's own actions, decisions, and consequences.

EXTERNAL COURSE ACCREDITATIONS AND CONDITIONS

There are no external accreditations or conditions identified for this course.

COURSE EVALUATION

Evaluation Item	Weight
Assignment	40
Exams	40
Quizzes	20

COURSE PASS GRADE

50

GRADING SYSTEM

A+: 90-100%	B+: 77-79%	C+: 65-69%	D: 50-54%	S - Satisfactory
A: 85-89%	B: 73-76%	C: 60-64%	F: 0-49%	I - Incomplete
A-: 80-84%	B-: 70-72%	D+: 55-59%		F- Repeat Course, included in GPA
				FS- Failure Supplemental
				FR- Repeat course, excluded from GPA

*For a complete chart of grades and descriptions, please see the Grading Policy.

LEARNING RESOURCES

Course Textbooks:

Recommended:

Title: Soils and Foundations
 Author: Cheng Liu, Jack B. Evett
 Publisher:
 Edition:
 Print ISBN: 978-0-13-222138-2
 eBook ISBN:

Additional Learning Resources:

Recommended: Chengh Liu and Jack B. Evett, Soils and Foundations, Person, Prentice Hall

Please see the [Campus Bookstore](#) to verify the current textbook costs and your [program page](#) for additional program fees and/or learning material requirements (see the "Tuition Fees" and "What You Need" sections).

Resources listed on the course outline support the achievement of learning outcomes, and may be used throughout the course to varying degrees depending on the instructor's teaching methodology and the nature of the resource.

Technology requirements - <https://www.canadorecollege.ca/BYOD>

The Harris Learning Library's staff can help you find resources to support your learning - <https://www.canadorecollege.ca/harris-learning-library>.

LEARNING ACTIVITIES

In Class Discussion

Assignments

Field Trips

Project Work

Lab Exercises

DELIVERY MODE

This course may be delivered, in whole or in part, in a number of modalities, including In-Person, Remote (synchronous and/or asynchronous), hybrid, or Hyflex, as per accreditation and/or regulatory standards where appropriate. This information is identified on the course schedule (student and faculty).

RECORDING GUIDELINES

This class may be recorded by faculty of the College. Faculty will inform students when recording of the class commences and ceases. 'Recorded' means that the audio-visual and chat portions of the class will be recorded and then be stored on the College or vendor provider server. They will be made available to students, but only for the express and sole use of those registered in this course. If you have any questions or concerns about this recording, please contact your instructor or the College's privacy officer at privacy.officer@canadorecollege.ca. Full recording guidelines can be found at: <https://cdn.agilitycms.com/canadore-college/academic-centre-of-excellence/Canadore%20Recording%20Guidelines.pdf>. Recordings are to be managed (or removed) as per the College's Recording Guidelines following the completion of the course.

EXPERIENTIAL LEARNING

All full-time programs of study at Canadore College strive to provide students with the opportunity for experiential learning. This course provides students with an experiential learning opportunity through:

Workplace/Lab Simulation (EL)

ACADEMIC POLICIES

Canadore College is committed to the highest standards of academic integrity, and expects students to adhere to these standards as part of the learning process in all environments. The College's Academic Integrity policy seeks to ensure that all students understand their rights and responsibilities in upholding academic integrity and that students receive an accurate and fair assessment of their work. Please review the Academic Integrity policy (A-18) and other academic policies found on our website:

<https://www.canadorecollege.ca/about/policies>.

COLLEGE POLICIES

- Protecting human rights in support of a respectful college community

For college policies please see: <http://www.canadorecollege.ca/about-us/college-policies>.

Accessibility Learning Services for Students with Disabilities - Student Success Services

Student Success Services provides comprehensive support to students. We aim to ensure that all students have equal access to educational opportunities and can succeed in their academic journey. Our services focus on reducing and eliminating barriers related to education through individualized accommodations and support. If you are a student with a disability, we encourage you to register with Accessible Learning by completing the Student Success – Accessible Learning Services Form (https://canadorecollege-accommodate.symplicity.com/public_accommodation/).

For more detailed information about the services offered, please visit our webpage:

<https://isucceed.canadorecollege.ca/students>. To connect with Student Success Services email studentsuccessnow@canadorecollege.ca or call 705.474.7600 ext 5205.

FIRST PEOPLES' CENTRE:

A culturally supportive and comfortable environment where you can study, socialize, and access a wide range of resources and confidential student focused services.

- Counselling services
- Elders on Campus and Cultural Advisors
- Cultural and Spiritual Wellness
- Peer tutoring/Peer Mentorship
- wholistic support network
- Social events and workshops on study skills, self-care & life skills

Drop by our offices at C254 College Drive, W103 Commerce Court or Call 705-474-7600 Ext. 5961

<https://www.canadorecollege.ca/first-peoples-centre>

WAIVER OF RESPONSIBILITY

Every attempt is made to ensure the accuracy of this information as of the date of publication. The college reserves the right to modify, change, add, or delete content.

HISTORICAL COURSE OUTLINES

Students use course outlines to support their learning. Students are responsible for retaining course outlines for future use in applications for transfer of credit to other educational institutions.