

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: SOIL MECHANICS

CODE NO. : ARC217

SEMESTER: 4

PROGRAM: ARC/CIVIL/CONSTRUCTION
ENGINEERING TECHNICIAN

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DATE: Jan, 06

PREVIOUS OUTLINE DATED: JAN-05

APPROVED:

DEAN

DATE

TOTAL CREDITS: 4

PREREQUISITE(S): None

LENGTH OF
COURSE:

16 WEEKS

TOTAL CREDIT HOURS: 64

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*For additional information, please contact C. Kirkwood, Dean
School of Technology, Skilled Trades & Natural Resources*

(705) 759-2554, Ext.688

I. COURSE DESCRIPTION:

This is an introductory soil mechanics course. Topics covered include: rock/soil origins, landform analysis, soil identification and classification system, site investigation, laboratory testing, movement of water through soils and compaction control.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Identify soil types, origins and properties.

Potential Elements of the Performance:

- Outline the geological and weathering processes that resulted in rock formations and soil deposits.
- Describe the characteristics of common soil deposits in Ontario.
- Review soil and geological maps for probable site conditions.

2. Solve applied problems in soils mechanics

Potential Elements of the Performance:

- Calculate mass/volume relationships for given units of soil.
- Solve compaction problems

3. Use the Unified Classification System and assess the capabilities and limitations of soil groups in engineering applications.

4. Conduct laboratory tests

Potential Elements of the Performance:

- Perform a mass-volume relationship test.
- Create a Moisture-Density Curve and Perform a compaction test
- Perform a sieve analysis.
- Perform a hydrometer analysis.
- Perform an Atterberg Limits test.
- Perform a constant head permeability test.

5. Study the evaluation of the density reached as a result of compaction efforts with rollers and other types of compaction equipment. The density of the soil as compacted will be measured and compared to a density goal for that soil as previously determined in laboratory tests.

Potential Elements of the Performance:

- Outline the field sampling methods for soils to be used as compacted fill.
 - Explain the purpose of the compaction (moisture-density) curve.
 - Construct a compaction curve for a sampled soil and determine the soil's maximum dry density.
 - Understand the difference between standard and modified proctor.
 - Measure the dry density of a compacted fill material in-situ.
 - Calculate the percent compaction of the compacted fill.
6. Research, schedule and execute a procedure for performing a field investigation.

Potential Elements of the Performance:

- Describe what information should be sought in a preliminary soil reconnaissance investigation.
- Outline the equipment and techniques used in soil sampling and testing in the field.
- Describe methods used to identify location of water table.
- Prepare site plans showing borehole locations.
- Document borehole logs.
- Draw profiles from given borehole logs.

III. TOPICS:

1. Rock/Soil Origins
2. Soil Mechanics Problems
3. Soil Classification Systems
4. Laboratory Testing of Soils
5. Compaction
6. Site Investigation

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**Principles of Geotechnical Engineering**

Fifth Edition

Braja M. Das

Highway Materials, Soils, and Concretes

Fourth Edition

Harold Atkins

V. EVALUATION PROCESS/GRADING SYSTEM:

You will be assigned a final grade on successful completion of laboratories assignments, and tests, weighted as follows:

Assignments	10%
Laboratories	35%
Mid-Term Exam	20%
Final Exam	<u>35%</u>
TOTAL	100%

Each Laboratory or assignment carries equal weight. Late submittals receive only a maximum grade of 60%. However, laboratories or assignments handed in later than one week will receive a grade of 0%.

An average of 60% on laboratories/assignments and 60% on tests is required for successful completion of this course.

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	

U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.

IX. ACADEMIC / CLASSROOM CONDUCT

Introduction: Sault College students, faculty members, employees and Ray Lawson Hall Residents constitute an academic community committed to training and education that will enhance effectiveness in the workplace and quality of life. The College community expects all members to discipline themselves, individually and collectively, and it requires adherence to the standards of conduct appropriate for an academic community.

Sault College considers its students adults and as such obligated to make responsible decisions. The Student Code of Conduct exists to assist in the effort of providing the best possible learning and living environment for all students. It is the obligation of students to treat all other members of the academic community with dignity and respect – including other students, faculty members, employees, visitors and neighbours of the College. The enforcement of the Student Code of Conduct is critical to the existence of such an environment for all members of the academic community. Ignorance of the rules or of the law is not a defence against disciplinary action. The College reserves all rights to criminal action where it deems necessary. Lack of intention to violate College policy will not generally excuse an infraction.

Academic Dishonesty:

Students shall submit written or other work in a course that shall be the product of their own efforts. "Academic Dishonesty" includes, but is not limited to, the following:

- a. Copying from another student's paper.
- b. Using material not authorized by the person administering the test or assignment.
- c. Collaborating with another student during a test without permission.
- d. Plagiarism (i.e. representing the work of another, as one's own, inclusive of purchases of a commercial nature).
- e. Collusion (i.e. obtaining from or giving to another student unauthorized assistance in course work).
- f. Falsification (i.e. modification, without authorization, of any examination paper, record, assignment, or report).
- g. Knowingly using, buying, selling, stealing, or soliciting contents of a test, examination paper, record, assignment, or report.
- h. Representing oneself as another student for the purpose of taking a test or examination or allowing oneself to be represented by another for the same
- i. Attempting to bribe or otherwise coerce a professor/instructor to obtain favours.
- j. Cheating (i.e. any misrepresentation by a student of their performance in a College subject for the purpose of obtaining credit to which they are not entitled).
- k. Any act designated by the President or his/her designate.

(Student Code of Conduct – Article 2, Section 2)

Attendance:

Students are expected to attend 100% of their classes. Attendance will be recorded within the first 15 minutes of each class.

Leaving or Entering During Class:

Students should exercise respect for faculty and students when leaving or entering a class that is already in session. Leaving or entering should be done with a minimal amount of interruption.

Disruption:

Students shall not obstruct or disrupt, or attempt to obstruct or disrupt, teaching, administration, disciplinary procedures, or other College activities.

(Student Code of Conduct – Article 2, Section 9)

Use of Electronic Devices:

General: Taking photos or making audio/video recordings on Sault College property without permission in ANY context in which the person being photographed or recorded has a reasonable expectation of privacy is prohibited. Examples include but are not limited to:

Classrooms: The use of cell phones, photographically capable cell phones, pagers and other communication/electronic devices during classes, clinical or field placement is prohibited unless authorized by faculty

Examinations: The use of cell phones, photographically capable cell phones, pagers and other communication/electronic devices during exams and midterms is prohibited unless authorized by faculty in charge.

(Student Code of Conduct – Article 2, Section 31)

SANCTIONS

College staff may impose sanctions in accordance with their responsibilities. Sanctions, which are imposed, may become part of the student's official record and are removed one year and one term after the student's last academic activity at Sault College.

The College shall make sanctions concerning students' actions and offences occurring within or affecting people on Sault College owned or controlled property, including but not limited to Ray Lawson Hall Residence, Sault College Aviation Hangar, off-campus at a College-sponsored event, or when such actions or offences at a non-College event off-campus have a direct impact on students' on-campus. The College reserves the right to assess any sanction it may deem appropriate. A serious breach or continuation or a repetition of behaviour in violation of the Student Code of Conduct will be cause for further sanctions up to and including expulsion.

Sanctions for Academic Dishonesty may include the following:

1. A professor/instructor may assign a sanction as defined below, or make recommendations to the Dean for disposition of the matter.
The professor/instructor may:
 - issue a verbal reprimand
 - make an assignment of a lower grade with explanation
 - require additional Academic assignments and issue a lower grade upon completion, to the maximum grade "C"
 - make an automatic assignment of a failing grade
 - recommend to the Dean, dismissal from the course with the assignment of a failing grade recommend to the Dean, dismissal from the College for a definite or indefinite period of time with a failing grade.

Sanctions for Academic Dishonesty may include the following Continued:

2. If the student denies the allegation of academic dishonesty the student should discuss the matter with the Director of Student Services immediately. If the matter cannot be resolved the student should file an Academic Appeal within three (3) working days. The appeal would automatically move to Step Two – Academic Appeal.
(Student Code of Conduct – Article 4)

Testing Absence

If a student is unable to write a test for medical reasons on the date assigned, the following procedure is required:

- In the event of an emergency on the day of a test, the student must telephone the College to identify the absence. The college has a 24-hour electronic voice mail system (759-2554) Ext. 2600. Documentation may be required to support the absence.
- The student shall provide the Professor with advance notice preferably in writing or e-mail of his/her need to miss the test.
- The student may be required to document the absence at the discretion of the Professor.
- All decisions regarding whether tests shall be re-scheduled will be at the discretion of the Professor.
- The student is responsible to make arrangements, immediately upon their return to the College with their course Professor in order to make-up the missed test prior to the next scheduled class for the course in question.