

**SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON**



COURSE OUTLINE

Course Title: FOUNDATIONS

Code No.: CIV 315

Semester: VI

Program: Civil Engineering Technology

Author: S. Ienco

Date: Jan 98

Previous Outline Date: Jan 94

**Approved: K. DeRosario
Dean**

**Jan. 9/98
Date**

Total Credits: 4

Prerequisite(s): ARC 217

Length of Course: 16

Total Credit Hours: 3

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For additional information, please contact Kitty DeRosario, Dean, School of Trades
& Technology Studies, (705) 759-2554, Ext. 642.

COURSE NAME

COURSE NUMBER**I. COURSE DESCRIPTION:**

This course covers the basic principles for selecting and designing foundations that transfer the total structure load to the underlying soil formations. Topics of study include: subsurface stress conditions, soil compression and consolidation, and foundation design criteria.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

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

1. Solve problems for combined stresses in soil masses and subsurface stresses

Potential Elements of the Performance:

- identify the conditions of stress at a point
- apply Mohr's circle for soil stress calculations
- calculate stresses in soil caused by its own mass
- calculate stresses in soil caused by vertical surface loading

2. Describe causes of settlement of structures, perform settlement calculations and recommend corrective process to control settlement damage.

Potential Elements of the Performance:

- define compressibility of soils
- calculate settlement of loads on clay
- calculate settlement of loads on sand
- determine settlement of soil as a result of earth fill

3. Identify laboratory tests for performing shear strength tests and solve basic shear strength problems for cohesionless and cohesive soils.

Potential Elements of the Performance:

- identify laboratory tests used for determining shear strength of soils
- identify shear failure plane characteristics
- calculate shear strength of cohesionless soils
- calculate shear strength of cohesive soils

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Continued)**

4. Assess relationships between soil conditions, foundation types and calculated loads and design deep and shallow foundations.

Potential Elements of the Performance:

- identify types of foundations
- apply the Terzaghi bearing capacity theory and modes of bearing failures
- apply the bearing capacity equation to determine size of footing for clay or sand
- determine the effect of water tables on bearing capacities of soils
- assess bearing capacities using standard penetration tests
- evaluate the effects on structures of total, differential, elastic, and consolidation settlements
- evaluate the axial capacity of single piles driven into sand or clay by use formulae and other methods
- calculate the settlement characteristics of bearing and friction piles
- identify the effects of negative skin friction on end-bearing and friction piles
- determine the effects of over driven piles on settlement and bearing capacities
- identify methods of determining pile settlements from pile load tests

III. TOPICS:

1. Distribution of Subsurface Soil Stresses
2. Settlement of Structures.
3. Shear Strength Analysis.
4. Introduction to Foundations.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

McCarthy F. David. *Essential of Soil Mechanics and Foundations*. Prentice Hall

V. METHOD OF EVALUATION (GRADING)

Students will be assigned a final grade based on successful completion of tests, assignments, projects and attendance, weighted as follows:

Assignments and Projects	30%
Two Midterm Tests	40%
Final Test	30%
TOTAL	100%

The course and curriculum are designed and limited to time based competency. Late assignments will receive a C (60) grade maximum. Assignments more than seven days overdue will receive a grade of zero.

A final letter grade will be assigned as follows:

A+	90-100%
A	80-89%
B	70-79%
C	55-69%
R	Repeat
X	A temporary grade limited to situations with extenuating circumstances, giving a student additional time to complete course requirements
U	Unsatisfactory (mid-term grade only)
S	Satisfactory (mid-term grade only)

V. METHOD OF EVALUATION (GRADING)
(Continued)

If at the end of the semester the overall mark is below 55%, then it will be up to the instructor whether or not a rewrite will be granted. The criteria employed for arriving at that decision is class and field attendance, class participation and overall grade which must be at least 45%. In the case a rewrite is granted, it will be permitted only once, it will cover the entire course outline and the overall maximum obtainable grade for the course will be limited to 60%.

VI. SPECIAL NOTES

1. If you are a students with special needs (e.g. physical, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.
2. 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 post-secondary institutions.
3. Substitute Course Information is available at the Registrar's Office.
4. The instructor reserves the right to modify the course and course outline as deemed necessary to meet the needs of the students.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult with the instructor and/or the Prior Learning Assessment Office. Credit for prior learning will be given upon successful completion of the requirements of the Prior Learning Assessment (PLA) as defined in the Course Analysis Form provided for this course.