

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: Foundations

CODE NO.: CIV315

PROGRAM: Civil Engineering Technology

SEMESTER: VI

AUTHOR: S. Ienco

DATE: January 1993

NEW: X REVISION: \_\_\_\_\_

APPROVED: *S. P. Coghlan* 94-01-10  
DEAN DATE

*M. [Signature]*  
*Jan / 94*

Foundations

CIV315

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Total Credit Hours 64

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I. PHILOSOPHY/GOALS:

This course is the second part of the soil mechanics studies. Topics of study include: stress conditions at a point, subsurface stresses, settlement analysis, shear strength, foundations types and design, earth slopes analysis and design and basic retaining structure design.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Solve problems for combined stresses in soil masses and subsurface stresses.
2. Describe causes of settlement of structures, perform settlement calculations and recommend corrective procedures to control settlement damage.
3. Recognize laboratory tests for performing shear strength tests and solve basic shear strength problems for cohesionless and cohesive soils.
4. Identify foundation types and design for shallow and deep foundations.
5. Define slope stability, recognize signs of potential slope failure, calculate for stability of unsupported slopes and make recommendations for improving stability of slopes.
6. Define types of retaining structures and perform design calculations.

III. TOPICS TO BE COVERED

1. Distribution of subsurface soil stresses .
2. Settlement of structures.
3. Shear strength analysis.
4. Introduction To Foundations.
5. Slope Stability.
6. Retaining structures.

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IV. TOPIC DESCRIPTION

REQUIRED RESOURCES

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1.0 Distribution of Subsurface soil Stresses

1.1 Conditions of stress at a point

Chapter 7

1.2 Mohr's circle for stresses

Chapter 7

1.3 Stresses in soil caused by its  
own mass

Chapter 8

1.4 Stresses in soil caused by vertical  
surface loading

Chapter 8

2.0 Settlement of structures

Chapter 9

2.1 Compressibility of soils

2.2 Settlement of loads on clay

2.3 Settlement of loads on sand

2.4 Settlement as a result of earth  
fill

3.0 Shear strength Analysis

Chapter 10

3.1 Laboratory tests

3.2 Failure plane characteristics

3.3 Shear strength of cohesionless soils

3.4 Shear strength of cohesive soils

4.0 Introduction to foundations

Chapter 13 & 14

4.1 Types of foundations

4.2 Shallow foundations loads, bearing  
capacity, size settlement and design.

4.3 Deep foundations, pile capacity,  
skin friction, group spacing, settlement,  
design and construction

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IV. TOPIC DESCRIPTION

REQUIRED RESOURCES

|     |  |            |
|-----|--|------------|
| 5.0 | <u>Slope stability</u>                 | Chapter 15 |
| 5.1 | Types of slope movements               |            |
| 5.2 | Slopes in homogenous cohesionless soil |            |
| 5.3 | Slopes in homogenous cohesive soils    |            |
| 5.4 | Method of slices                       |            |
| 6.0 | <u>Retaining Structures</u>            | Chapter 16 |
| 6.1 | Computation of wall pressures          |            |
| 6.2 | Design of rigid retaining walls        |            |
| 6.3 | Design of flexible retaining walls     |            |

V. EVALUATION METHOD:

|                                    |       |
|------------------------------------|-------|
| Assignments                        | 20%   |
| Two term test each of equal weight | 50%   |
| Final test                         | 30%   |
|                                    | ----- |
| TOTAL                              | 100%  |

|    |            |
|----|------------|
| A+ | 90% - 100% |
| A  | 80% - 89%  |
| B  | 70% - 79%  |
| C  | 55% - 69%  |
| R  | Repeat     |

- 1) Minimum acceptable grade is 60% with a minimum pass on two of the three tests plus a minimum pass on assignments.
- 2) Each major assignment will carry equal weight.
- 3) If at the end of the semester your overall average of the combined assignments and tests is below 60%, then it will be up to the instructor whether you receive an "R" grade or a rewrite. The criteria employed for arriving at that decision is class attendance, class participation and overall grade, which must be at least 50%.

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- 4) If a rewrite is granted it will cover the entire semester course work and the maximum overall obtainable grade on the rewrite is a "C".

VI. REQUIRED STUDENT RESOURCES (including textbooks and workbooks)

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

VII. SPECIAL NOTES

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of the students.