
Ambo University Woliso Campus
Faculty of Technology
Civil Engineering Program

I. Pre information

- Course Name: Foundation Engineering-I
- Course Code: CEng-----
- Target Group: 3rd year Civil (Regular)
- Academic year: 2019/20
- Semester: II
- Pre-requisite: Soil Mechanics II
- ETCTS: 5

II. Course Objectives:

The general objectives of delivering the course are:

- Enabling the learners to the purpose of soil exploration and preparing soil exploration report.
- Enabling the learners to know the purpose of foundations, their types and their selection and designing of shallow foundation.
- Ensuring that students are capable of knowing purpose of soil retaining wall, their types, proportion and design and failure mechanism.

III. Course Outline

CHAPTERS:

1. Soil Exploration

- 1.1 Purpose of Soil Exploration
- 1.2 Planning Soil Exploration Program
- 1.3 Methods of Exploration
- 1.4 Ground Water Measurement
- 1.5 Depth and Number of Borings
- 1.6 Data Presentation
- 1.7 Soil Exploration Report

2. Foundation Types and Their Selections

- 2.1 Purposes of Foundations
- 2.2 Types of Foundations
- 2.3 General Principles of Foundation Design
- 2.4 Loads on Foundation
- 2.5 Selection of Foundation Type

3. Design Of Shallow Foundations

- 3.1 Elements of Reinforced Concrete Design
 - 3.1.1 Design Methods
- 3.2 Analysis and Design of Isolated footings
- 3.3 Analysis and Design of Combined Footings
- 3.4 Analysis and Design of Strap Footings
- 3.5 Analysis and Design of Mat Foundations.

4. Analysis and Proportioning of Retaining walls

- 4.1 Common Types of Retaining Walls
- 4.2 Common Proportions of Retaining Walls
- 4.3 Forces on Retaining Walls
- 4.4 Stability of Retaining Walls

5. Design and Analysis of Soil Retaining Structure

- 5.1 Classification of Retaining Walls
- 5.2 Design of conventional Retaining wall
- 5.3 Application of Lateral Earth Pressures Theories to Design
- 5.4 Failure Mechanism of Retaining Walls
- 5.5 Mechanically Stabilized Retaining Walls
- 5.6 Considerations in Soil Reinforcement
- 5.7 Primary uses Geo-textiles
- 5.8 Geogrids
- 5.9 General Design Considerations
- 5.10 Retaining Walls with Metallic Strip Reinforcement
- 5.11 Sheet Pile Walls
 - 5.11.1 Types of Sheet Piles
 - 5.11.2 Shape Classifications
 - 5.11.3 Construction Methods

Method of Assessment and Evaluation

The overall method of assessment and evaluation of the course are: Continuous Assessment (Attendances, Quizzes, Lab Report, Assignments and Mid Term Exam) accounts 60% of the total and the remaining 40 % will be Final Exam.

NB: 85 % of the attendance during lectures and practical work is mandatory.

References

1. Tefera, A., Foundation Engineering; P.K.R. Dr. Arora, Foundation and Soil Mechanics.
2. Bowles, J. E., Foundation Analysis and Design, 5th edition, McGraw Hill, 1996.
3. Das, B. M., Principles of Foundation Engineering, PWS, 3rd edition, 1995.
4. Prakash, S., 1995. Fundamentals of Soil Mechanics, Prakash Foundation.
5. Budhu M., 2000. Soil Mechanics and Foundations, Wiley and Sons.