

WOLLO UNIVERSITY
KOMBOLCHA INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING



Course Title: Structural Design
Program: Regular (Year V, sem I)
Course Code: CEng5123
Instructors: Henok A.
Dawit Z.

Prerequisite: CEng 3112
Academic year: 2011 E.C (2018/2019)
Credit: 3 CrH (5 CP)

COURSE OUTLINE

CHAPTER 1

Yield Line Analysis for Slabs

- 1.1 Introduction
- 1.2 Method of Yield Line
Analysis

CHAPTER 2

Strip Method for Slabs

- 2.1 Introduction
- 2.2 Strip Method for Slabs
 - Assignment I----
 - Semester Project Begins---

CHAPTER 3

Loads and Load Effects

- 3.1 Classification of Loads
- 3.2 Wind Load
- 3.3 Earthquake Load
- Assignment II-----

CHAPTER 4

Lateral Force Resisting Systems

- 4.1 Introduction
- 4.2 Lateral Force Resisting Systems

CHAPTER 5

Plastic Analysis in Framed Structures

CHAPTER 6

Introduction to Composite Steel – Concrete Structures

--Semester Project Submission--

Mode of delivery

- Lecture
- Tutorials
- Assignments
- Semester project

Mode of assessment:

- Continuous Assessment-----**50%**
 - Tests-----10%
 - Semester project-----30%
 - Assignments-----10%
- Final Exam-----**50%**

Total-----100%

Reference:

1. Arthur H Nelson, Design of concrete structures, McGraw-Hill, 14th Edition, 2010.
 2. James Macgregor, Reinforced Concrete Mechanics and Design, 6th Edition, 2012.
 3. W.H. Mosley, R. Hulse, J.H Bungey, Reinforced Concrete Design, Palgrave Macmillan, 2007.
 4. Jack C. McCormac, Design of Reinforced Concrete, McGraw-Hill, 2005.
 5. EBCS EN 1, 2, 3 and 8, 2015.
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- 2.0 Introduction
- 2.1 Bearing Failure Modes
- 2.2 Ultimate Bearing Capacity Equations
 - 2.2.1 Terzaghi's Bearing Capacity equation
 - 2.2.2 Meyerhof's Bearing Capacity equation
 - 2.2.3 Hansen's Bearing Capacity Equation
 - 2.2.4 A comparative summary of the three bearing capacity equations
 - 2.2.5 Allowable bearing capacity and factor of safety
 - 2.2.6 Eccentric Loads
- 2.3 Field Tests
 - 2.3.1 Plate Loading Test
 - 2.3.2 Standard Penetration Test

- CHAPTER 3: Lateral Earth Pressure
- 4 Introduction
- 4.1 Definitions of Key Terms
- 4.2 Lateral Earth Pressure at Rest
- 4.3 Active and Passive Lateral Earth Pressures
- 4.4 Rankine Active and Passive Earth Pressures
- 4.5 Lateral Earth Pressure due to Surcharge
- 4.6 Lateral Earth Pressure When Groundwater is Present
- 4.7 Summary of Rankine Lateral Earth Pressure Theory
- 4.8 Rankine Active & Passive Earth Pressure for Inclined Granular Backfill
- 4.9 Coulomb's Earth Pressure Theory

- CHAPTER 4: Slope Stability
- 5 Introduction
- 5.1 Definitions of Key Terms
- 5.2 Types of Slope Failure
- 5.3 Some Causes of Slope Failure
- 5.4 Two-Dimensional Slope Stability Analysis
- 5.5 Stability Analysis of Infinite Slopes
- 5.6 Rotational Slope Failure

Mode of delivery

- Lecture
- Tutorials
- Group Discussion
- Home Works
- Laboratory

Mode of assessment:

- Continuous Assessment-----**50%**
 - Tests-----10%
 - Laboratory-----20%
 - Quizzes-----10%
 - Assignments-----10%
- Final Exam-----**50%**
- Total-----100%**

Reference:

1. Das, Braja, Principles of Geotechnical Engineering, 5th ed., Brooks/Cole, 2002.
2. Budhu M. (2000), Soil Mechanics and Foundations, Wiley and Sons.
3. Lambe, T. W., Whitman, R. V. (1999), Soil Mechanics, John Wiley & Sons Inc.
4. Teferra, A. & Mesfin, L., Soil Mechanics, AAU
5. Craig, R.F. (2004), Craig's Soil Mechanics, 7th edition, Taylor & Francis.