

EN3005 Structural Design

[Lectures: 26 hrs; Tutorials: 13 hrs; Pre-requisites: CV2011; Academic Unit: 3.0]

Learning Objective

The objective of the course is to provide environmental engineering students a basic understanding of the behaviour and design of simple reinforced concrete and steel members. This is achieved through analysis and design of beams, slabs, and columns at the cross section and member level. The emphasis of the course is on basic design concepts together with appropriate code application.

Course Content

Part 1 Concrete Design: Basic structural members and structural systems. Loads and load effects. Section analysis and design for bending. Design for shear. Design of compression members. Design of slab systems. Design of foundation.

Part 2 Steel Design: Limit state design. Calculation of beam loads. Section classification. Local buckling and lateral torsional buckling. Design check for tension, compression, shear, bending and deflection.

Course Outline

S/N	Topic
1	Basic Design Concepts
2	Basic Concrete Material Properties
3	Design for Bending
4	Design for Shear
5	Design for Serviceability
6	Analysis and Design of Compression Members
7	Analysis and Design of Slab Systems
8	Analysis and Design of Foundation
9	Limit State Design in Steel
10	Beam loads, Local Buckling and Section Classification
11	Shear and moment capacities
13	Tension members
14	Compression members, Combined axial force with moment

Learning Outcome

At the end of the course, students are expected to be able to design basic concrete and steel structures.

Textbooks/References

1. Mosley, W.H., Hulse, R. and Bungey, J.H., "Reinforced Concrete Design to EuroCode 2", 7th edition, Palgrave Macmillan, London, 2012.
2. Wight, J.K., "Reinforced Concrete: Mechanics and Design", 7th edition, Pearson/Prentice-Hall, 2015.