

Design of Concrete Structures

Course Code CE-412	Credit Hours 3-0
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Course Description

This course examines the design of basic reinforced concrete structural members, including continuous beams, short columns, slabs, footings supporting axial loads and uniaxial bending, combined footing, cantilever retaining walls, bond, anchorage and development length and Introduction to Precast and pre-stressed members with in purview of the ACI 318 Standard Code practice.

Text Book:

1. Design of Reinforced Concrete, 9th Edition, Jack C. McCormack
2. Properties of Concrete, 3rd ed. ELBS, by A.M.Neville.
3. Design of Concrete Structures (14th Edition), by Arthur H. Nilson, David Darwin, and Charles W. Dolan, McGraw-Hill, New York, NY 10020.
4. ACI Building Code Requirement for reinforce concrete structures 318-11.
5. Guidelines for design of simple reinforced concrete buildings ACI 314-11.

Reference Book:

1. Advanced Concrete Technology by John Newman
2. Reinforced Concrete - Mechanics and Design (5th edn) by James K. Wright and James G. MacGregor, Pearson-Prentice Hall, Upper Saddle River New Jersey NJ 07458.
3. Design of Reinforced concrete by Jack C. McCormac and Russell H. Brown 9th edition.

Prerequisites :

CE -308 PRC – I, CE - 310 PRC-II.

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25

Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	A review to Deign of Beams (Flexure and Shear) and One Way Slabs for Gravity Loadings.
2-3	Introduction and Design of Beams for Torsion
4-5	Introduction and Design of 2 Way Floor Systems using ACI Direct Design Method
6-8	Design of Columns for Bi Axial Bending. Introduction and Design of Slender Columns, CEP
9	Mid Semester Exams
9-11	Design of Isolated and Combined footings for Concentric and Eccentric Gravity Loads
12	Introduction and Design of Reinforced Concrete Retaining Walls
13-14	Introduction and Design of Shear Walls
15	Introduction and Design of Beams (Flexure Only) for seismic loads using ASCE 7-95 (Introduction to rebar design for stress reversals in seismic designs)
16	Introduction to structural dynamics and Artificial Intelligence in Structural Health Monitoring
17	CEP Presentations
18	End Semester Exam

Practical: Nil.