REINFORCED CONCRETE STRUCTURES

Course Code: 15CE1120

L	T	P	C
4	0	0	4

Pre-requisites:

Strength of materials, Concrete technology, Structural analysis – I.

Course Outcomes:

At the end of the Course, the Student will be able to:

CO 1 Design RC beams subjected to bending using Working Stress Method.

CO 2 Explain the concept of Limit State Design and apply it to beams

CO 3 Apply Limit state design for flanged sections subjected to shear, torsion and Concept of bond

CO 4 Design one-way, two-way and continuous slabs

CO 5 Design columns and isolated footings subjected to axial load, uni-axial and bi-axial bending

UNIT-I (10 Lectures)

INTRODUCTION TO WORKING STRESS METHOD:

Introduction– Design for bending –Analysis and design of singly reinforced and doubly reinforced beams.

UNIT-II (10 Lectures)

INTRODUCTION TO LIMIT STATE DESIGN:

Concepts of limit state design-Characteristic loads-Characteristic strength- Partial load factor and Material Safety factors-Representative Stress- Strain curves- Assumptions in limit state design-Stress block parameters -Limiting moment of resistance.

SINGLY AND DOUBLY REINFORCED BEAMS:

Limit state analysis and design of singly reinforced, doubly reinforced beams.

UNIT-III (10 Lectures)

FLANGED SECTIONS:

Design of T and L beam sections.

SHEAR, TORSION AND BOND:

Limit state analysis and design of sections for shear and torsion – Concept of bond, anchorage and development length, I.S Code provisions. Design examples in simply supported and continuous beams.

UNIT-IV (10 Lectures)

SLABS:

Design of one way slabs – Two way slabs and Continuous slabs using I.S coefficients.

UNIT-V (10 Lectures)

COLUMNS:

Short and long columns – Uni- axial loads, Uni - axial bending and bi-axial bending – I.S code provisions.

FOOTINGS:

Different types of footings–Design of isolated, square, rectangular and circular footings.

NOTE: All the designs to be taught in Limit State Method.

Following plates/drawings should be prepared by the students:

1. Reinforcement details of T-beam and L-beam.
2. Reinforcement details of continuous beam.
3. Reinforcement details of typical cross section of column and footing.
4. Reinforcement details of One- way, Two-way and Continuous slabs.

TEXT BOOKS:

1. A.K.Jain, "Reinforced Concrete Design", 5th Edition, Charotor Publications, New Delhi, 2010.

2. Pillai & Devdas Menon, "Reinforced Concrete Design", 3rd Edition, Tata McGraw Hill, New Delhi, 2009.

REFERENCES:

1. N.C. Sinha and S.K Roy, "Fundamentals of Reinforced Concrete", 4th Edition, S. Chand Publishers, 2008.
2. N. Krishna Raju and R.N. Pranesh, "Reinforced Concrete Design", 8th Edition, New age International Publishers, New Delhi, 2004.
3. N.Subramanian, "Design of Reinforced Concrete Structures", 2nd Edition, Oxford University Press, 2013.