Semester 5

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-501	Design of RCC Structures	PCC	5	4	1	0	50	100	150

Course Outcomes:

At the end of the course the students will be able to :	
CO1	Formulate RCC beams using limit state method.
CO2	Analyze the flexural member for shear, bond and torsion.
CO3	Interpret RCC slab and detailing using limit state method.
CO4	Design of RCC columns and footing using limit state method.
CO5	Describe the various construction techniques for High Rise Buildings.

Detailed Syllabus

Section-A

Unit 1: Design stress-strain curve of concrete and reinforcing steel, Fundamental concepts of design of RC members (design philosophies): Working stress method and limit state method, Introduction to various related IS codes. Limit state design analysis and design of singly reinforced, doubly reinforced rectangular beams and flanged beams for flexure using codal provisions.

(10 Hrs)

Unit 2: Limit state of collapse in shear: Analysis and design for shear reinforcement and its detailing. Limit state of serviceability for deflection: control of deflection as per codal provisions of empirical coefficients. Limit state of collapse in bond, concept of bond stress, anchorage length and development length. Detailing and curtailment of reinforcement as per codal provisions.

(10 Hrs)

Unit 3: Torsion: Analysis and Design of beams for torsion as per codal method. Slabs: Analysis and design of one way and two way slabs using LSM, Detailing of reinforcement. Check for shear and deflection.

(10 Hrs)

Section-B

Unit 4: Columns: Analysis and design of axially loaded short columns using LSM for axial load and axial plus uniaxial moment. Introduction to Pu- Mu interaction curves and their use for eccentrically loaded columns**.** Footings: Analysis and design of isolated column footing for axial load. Introduction to combined footing for two columns.

(12 Hrs)

Unit 5: High Rise Structures: Construction techniques for high rise buildings, chimneys, dams. Special problems of high-rise construction, Fire Resistance in Structures: Fire hazards in buildings and preventive measures, Low-Cost Housing: Types, Design and advantages. Special Constructions: Pre-Cast and Prefabricated Construction and Modular Construction.

(12 Hrs)

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Design of Reinforced Concrete Structures	N. Subramanian	Oxford	1st edition (2014)
2	Reinforced Concrete Design	Pillai and Menon	Tata McGraw-Hill	3rd edition (2017)

Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Design of Reinforced Concrete Structures	P.Dayaratnam	Oxford & IBH Pub	5th edition (2017)
2	Reinforced Concrete	I.C.Syal & A,K,Goel	S Chand Publishing	4th edition (2003)
3	Reinforced Concrete Design	S.N.Sinha	Tata McGraw-Hill	3rd edition (2017)