

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Civil Engineering

(Applicable from the academic session 20182019)

CE(PC)501	Design of RC Structures	2L + 1T	3 Credits
Course Outcome	After going through this course, the students will be able to: 1. Understand material properties and design methodologies for reinforced concrete structures. 2. Assess different type of loads and prepare layout for reinforced concrete structures. 3. Identify and apply the applicable industrial design codes relevant to the design of reinforced concrete members. 4. Analyse and design various structural elements of reinforced concrete building like beam, slab, column, footing, and staircase. 5. Assessment of serviceability criteria for reinforced concrete beam and slab. 6. Prepare structural drawings and detailing and produce design calculations and drawing in appropriate professional format.		
Prerequisite	Introduction to Solid Mechanics (CE(ES)402), Concrete Technology (CE(PC)404).		
Module 1:	Introduction: Principles of design of reinforced concrete members - Working stress and Limit State method of design	1L	
Module 2:	Working stress method of design: Basic concepts and IS code provisions (IS: 456 2000) for design against bending moment and shear forces - Balanced, under reinforced and overreinforced beam/ slab sections; design of singly and doubly reinforced sections	2L+2T	
Module 3:	Limit state method of design: Basic concepts and IS code provisions (IS: 456 2000) for design against bending moment and shear forces; concepts of bond stress and development length; Use of 'design aids for reinforced concrete' (SP:16).	5L+2T	
Module 4:	Beam Design by LSM: Analysis, design and detailing of singly reinforced rectangular, 'T', 'L' and doubly reinforced beam sections by limit state method.	3L+2T	
Module 5:	Slab Design by LSM : Design and detailing of one-way and two-way slab panels as per IS code provisions	2L+1T	
Module 6:	Continuous slab and beam design by LSM: Design and detailing of continuous beams and slabs as per IS code provisions	2L+1T	
Module 7:	Design of Staircases by LSM: Types; Design and detailing of reinforced concrete doglegged staircase	3L+1T	
Module 8	Design of Columns by LSM: Design and detailing of reinforced concrete short columns of rectangular and circular crosssections under axial load. Design of short columns subjected to axial load with moments (uniaxial and biaxial bending) – using SP 16.	4L+1T	
Module 9	Design of Foundation by LSM: Design and detailing of reinforced concrete isolated square and rectangular isolated and combined footing for columns as per IS code provisions by limit state method Design and detailing of Pile foundation as per IS code provisions.	6L+2T	
IS Codes	1	IS: 456 - 2000	
	2	IS 875 – I (1987), II (1987), -III (2015), -IV(1987), V (1987)	
	3	SP: 16 Design Aid to IS 456	
Reference	Sl.	Book Name	Author
	1	Reinforced Concrete Design	Pillai and Menon
	2	Reinforced Concrete Design	Krishna Raju & Pranesh
	3	R.C.C. Design	B.C. Punmia
	4	Reinforced concrete structures	N. Subramanian
	5	Limit State Design of Reinforced Concrete	P. C. Varghese
	6	Reinforced concrete	S.N. Sinha
			Publishing House
			TMH
			New Age
			Laxmi Publication
			OXFORD University Press
			PHI
			TMH