Course Modules of the Subject Taught for the Session Jan-May 2025-26 (ODD SEM)
Course Syllabi with CO's

Course Syllabi with CO's	
Faculty Member: Dr. Pujitha Ganapathi C.	Academic Year: 2025-2026

Department: Civil Engineering							

Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total Hrs
				L	T	P	
BCV601	**Design of RC Structures**	**Core**	**Nil**	**3**	**-**	**2**	**50**

Objectives	1. Identify, formulate and solve engineering problems of RC elements subjected to different kinds of loading. 2. Follow a procedural knowledge in designing various structural RC elements. 3. Impart the usage of codes for strength, serviceability and durability. 4. Acquire knowledge in analysis and design of RC elements.

Topics Covered as per Syllabus

Module-1
Introduction to working stress and limit State Design: Introduction to working stress method, Difference between Working stress and Limit State Method of design. Philosophy and principle of limit state design with assumptions. Partial Safety factors, Characteristic load and strength. Stress block parameters, concept of balanced section, under reinforced and over reinforced section. Limiting deflection, short term deflection, long term deflection, Calculation of deflection of singly reinforced beam only.

08 Hours

Module-2
Limit State Analysis of Beams: Analysis of singly reinforced, doubly reinforced and flanged beams for flexure and shear.

08 Hours

Module-3
Limit State Design of Beams: Design of singly reinforced beams with check for shear, check for development length and other checks. Design of doubly reinforced beams and flanged sections without checks.

08 Hours

Module-4
Limit State Design of Slabs and Stairs: Introduction to one way and two-way slabs, Design of Cantilever, simply supported and one-way continuous slab. Design of two-way slabs for different boundary conditions. Design of dog legged and open well staircases

08 Hours

Module-5
Limit State Deign of Columns and Footings: Analysis and design of short axially loaded RC column. Design of columns with uniaxial and biaxial moments, Design concepts of the footings. Design of Rectangular and square column footings with axial load.

08 Hours

Practical component of IPCC

Sl No.	Experiments
1	Calculation of deflection of singly reinforced beam using Excel
2	Design of a simply supported RCC singly reinforced beam using Excel and draw the reinforcement details
3	Design of a simply supported RCC doubly reinforced beam using Excel and draw the reinforcement details

4	Design of singly reinforced beams with check for shear, check for development length and other checks using Excel.
5	Design of a cantilever beam using Excel and draw the reinforcement
6	Design a simply supported RCC one way slab with intermediate support and draw the reinforcement details
7	Design a two-way slab for the given data and prepare Bar bending schedule
8	Design a short axially loaded RC column using Excel
9	Design the reinforcement for RCC square column with isolated square footing
10	Design the reinforcement for RCC circular column with isolated square footing
11	Creation of models related to RC Structural elements. (Demonstration)

List of Textbooks

1. Unnikrishnan Pillai and Devdas Menon, " Reinforced Concrete Design" ,
2. McGraw Hill, New Delhi 2. N Subramanian, " Design of Concrete Structures" , Oxford university Press
3. H J Shah, "Reinforced Concrete Vol. 1 (Elementary Reinforced Concrete)" , Charotar Publishing House Pvt. Ltd.

List of Reference Books

1. P C Varghese, "Limit State design of reinforced concrete", PHI, New Delhi.
2. W H Mosley, R Husle, J H Bungey, "Reinforced Concrete Design", MacMillan Education, Palgrave publishers.
3. Kong and Evans, "Reinforced and Pre-Stressed Concrete", Springer Publications.
4. A W Beeby and Narayan R S, "Introduction to Design for Civil Engineers", CRC Press.
5. Robert Park and Thomas Paulay, "Reinforced Concrete Structures", John Wiley & Sons, Inc.

List of URLs, Textbooks, Notes, Multimedia Content, etc

https://nptel.ac.in/courses/105105105

Graduate Attributes (As per NBA)

	At the end of the course the student will be able to:	RBT Level
Course Outcomes	CO1: Understand the design philosophy and principles.	L2
	CO2: Solve problems of RC elements subjected to flexure, shear and torsion.	L3
	CO3: Demonstrate the procedure in designs of RC structural elements such as slabs, columns and footings.	L3 & L4
	CO4: Owns professional and ethical responsibility	L2

CIE marks for the theory component are 25 marks and that for the practical component is 25 marks. 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests (Two Tests, each of 15 Marks with 01-hour duration, are to be conducted) and 10 marks for other assessment methods.

The Correlation of Course Outcomes (CO's) and PO's and PSOs

Course Code:	BCV601	Title: Design of RC Structures							Faculty Member: Dr. Pujitha Ganapathi C.				

Course Outcomes	Program Outcomes											PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO-1	2	1	-	-	-	-	-	-	-	-	-	-	-
CO-2	3	3	2	-	-	-	-	2	-	2	-	2	-
CO-3	2	1	1	-	-	-	-	2	-	2	-	2	-
CO-4	1	-	-	-	-	-	-	2	-	-	-	2	-

Note: 3 = Strong Contribution 2 = Average Contribution 1 = Weak Contribution '-' = No Contribution