

Lecture Plan

Department	Civil Engineering
Program/Year/Semester/Sec	B.Tech./3 rd /6 th /SF-24
Course Name/ Course Title	Design of Concrete Structures
Course Code	BCE-601
Name of Faculty	SHASHANK DHAR
Department of Faculty	CIVIL ENGINEERING

Pre-requisites for the Course	Students should have interest in learning about structures
	Student should have basic knowledge of construction materials

Type of Course	Theory/Lecture
Contact hours	40

Course Outcomes (COs)

At the end of this course students will demonstrate the ability to:	
CO1	Recall key IS codes, design philosophies, and basic RCC terminologies & learn WSM Method
CO2	Apply IS code provisions for designing beams and understanding shear behavior
CO3	Analyze structural behavior and design of slabs and staircases.
CO4	Evaluate the design efficiency of columns for axial and biaxial loading conditions
CO5	Designs for footings, retaining walls, and structural drawings with bar bending schedules.

Unit	Topic & sub – topic	Topics Covered	COs	Lectures proposed	Lecture delivered	Date	No. of students present (57)	Sign. of faculty
1	Design Philosophies: Working Stress Method (WSM)		CO1	1				
	Design Philosophies: Limit State Method (LSM)		CO1	1				
	Basic Assumptions in RCC Design		CO1	1				
	Stress-Strain Relationships in Concrete and Steel		CO1	1				
	Introduction to IS 456:2000		CO1	2				
	Design Aids (SP-16)		CO1	1				
	Design of RCC Beam by Working Stress Method		CO1	1				
Total Lectures				8				
2	Design of Rectangular Singly R/F beam		CO2	1				
	Design of Rectangular Doubly R/F beam		CO2	1				
	Design of T-Beams as per LSM		CO2	1				
	Design of L-Beams as per LSM		CO2	1				
	Analysis of Shear Strength		CO2	1				
	Design of Shear Reinforcement		CO2	1				
	Development Length		CO2	1				
	Anchorage Bond, and Flexural Bond		CO2	1				
Total Lectures				8				
3	Design of One-Way Slabs		CO3	1				
	Design of Two-Way Slabs		CO3	2				
	Design of Continuous Slabs		CO3	1				
	Design of Cantilever Slabs		CO3	1				
	Serviceability Limit States: Deflection, Cracking, and Vibration Control		CO3	1				
	Design of Dog-Legged Staircases and Open-Well Staircases		CO3	2				
Total Lectures				8				
4	Classification of Columns: Short and Long Columns		CO4	2				
	Design of Columns under Axial Load and Biaxial		CO4	2				

	Effective Length of Columns, Slenderness Ratio		CO4	2				
	Ductile Detailing as per IS 13920:2016 for Seismic Design		CO4	2				
	Total Lectures			8				
5	Design of Isolated, Combined, and Strap Footings		CO5	2				
	Structural Behavior of cantilever and counterfort RW and Design of Retaining Walls (Cantilever Type)		CO5	2				
	Stability Analysis: Overturning, Sliding, and Bearing Capacity Considerations		CO5	1				
	Structural Behavior of counterfort RW and Design of Retaining Walls (Cantilever Type)		CO5	1				
	Structural Behavior Design of Retaining Walls (Cantilever Type)		CO5	2				
	Total Lectures			8				

Text Books & References

1. IS 456:2000 – Code of Practice for Plain and Reinforced Concrete
2. IS 13920:2016 – Ductile Detailing of Reinforced Concrete Structures Subjected to Seismic Forces
3. IS 1893:2016 – Criteria for Earthquake Resistant Design of Structures
4. SP-16 – Design Aids for Reinforced Concrete to IS 456:2000
5. SP-34 – Handbook on Concrete Reinforcement and Detailing
6. Reinforced Concrete Design by S. Unnikrishna Pillai & Devdas Menon
7. Limit State Design of Reinforced Concrete by A.K. Jain
8. Reinforced Concrete Structures by B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain
9. Design of Reinforced Concrete Structures by N. Krishna Raju
10. Reinforced Concrete Design by M.L. Gambhir
11. Fundamentals of Reinforced Concrete Design by S.N. Sinha

Signature of Faculty

Signature of HOD

Comments	
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