

REINFORCED CONCRETE STRUCTURES DRAWING LABORATORY

VI Semester: CE																				
Course Code	Category	Hours / Week			Credits	Maximum Marks														
ACEB21	Core	L	T	P	C	CIA	SEE	Total												
		-	-	2	1	30	70	100												
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 24			Total Classes: 24													
<p><b style="color: blue;">I. COURSE OVERVIEW:</p> <p>Design of Reinforced Concrete Structures deals with methods of reinforced concrete construction; behavior and design of reinforced concrete beams and one-way slabs considering deflections, flexure, shear and anchorage; behavior and design of columns including slenderness effects; design of spread footings; design of lateral load resisting frames and walls for earthquake effects. Laboratory includes experiments and design sessions leading to development of a structural design project in reinforced concrete.</p> <p><b style="color: blue;">II. OBJECTIVES:</p> <p>The course should enable the students to:</p> <ol style="list-style-type: none"> I. Understand reinforcement details of various concrete members. II. Produce and interpret reinforcement details of various beams. III. Develop reinforcement design of columns with lateral ties and spiral reinforcement. IV. Interpret and produce reinforcement details of slabs, footings and staircase. <p><b style="color: blue;">III. COURSE OUTCOMES:</p> <p>After successful completion of the course, students should be able to:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">CO 1 Recall basic concepts of reinforced concrete design, material stress-strain curves, and safety factors to know the properties of concrete structure.</td> <td style="width: 20%; text-align: right;">Remember</td> </tr> <tr> <td>CO 2 Explain the concept of Stress block parameters and use the design concept of working stress method, limit state method for designing different structural components</td> <td style="text-align: right;">Understand</td> </tr> <tr> <td>CO 3 Explain the concept of bond, anchorage and development length and section for shear and torsion for safe designing of residential, commercial and industrial structures.</td> <td style="text-align: right;">Understand</td> </tr> <tr> <td>CO 4 Solve singly reinforced, doubly reinforced, T, L beam sections as per IS: 456-2000 for obtaining the reinforcement details in load bearing members.</td> <td style="text-align: right;">Apply</td> </tr> <tr> <td>CO 5 Solve One-way, Two-way, slabs sections as per IS: 456-2000 for obtaining the reinforcement details in load bearing members.</td> <td style="text-align: right;">Apply</td> </tr> <tr> <td>CO 6 Develop the concept of Axial loading uni-axial and bi-axial bending of vertically loaded members, isolated and Combined footing to obtain reinforcement details.</td> <td style="text-align: right;">Apply</td> </tr> </table>									CO 1 Recall basic concepts of reinforced concrete design, material stress-strain curves, and safety factors to know the properties of concrete structure.	Remember	CO 2 Explain the concept of Stress block parameters and use the design concept of working stress method, limit state method for designing different structural components	Understand	CO 3 Explain the concept of bond, anchorage and development length and section for shear and torsion for safe designing of residential, commercial and industrial structures.	Understand	CO 4 Solve singly reinforced, doubly reinforced, T, L beam sections as per IS: 456-2000 for obtaining the reinforcement details in load bearing members.	Apply	CO 5 Solve One-way, Two-way, slabs sections as per IS: 456-2000 for obtaining the reinforcement details in load bearing members.	Apply	CO 6 Develop the concept of Axial loading uni-axial and bi-axial bending of vertically loaded members, isolated and Combined footing to obtain reinforcement details.	Apply
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LIST OF EXPERIMENTS																				
Week-1	INTRODUCTION																			
Introduction to reinforced concrete structures.																				
Week-2	SIMPLY SUPPORTED BEAM																			
Detailing of simply supported beam.																				
Week-3	CONTINUOUS BEAM																			
Detailing of continuous beam.																				

Week-4	T-BEAM/ L-BEAM
Reinforcement details of T- Beam	
Week-5	COLUMN WITH LATERAL TIES
Rectangular tied reinforcement details.	
Week-6	COLUMN WITH SPIRAL REINFORCEMENT
Round spiral reinforcement details.	
Week-7	BEAM COLUMN JOINT
Reinforcement details of exterior beam-column joint .	
Week-8	SLAB WITH TORSIONAL REINFORCEMENT
Slab with torsional reinforcement.	
Week-9	FOOTINGS
Combined trapezoidal footing	
Week-10	STAIRCASE
Plan of R.C.C staircase.	
Week-11	STAIRCASE
Sectional elevation of R.C.C staircase.	
Week-12	DUCTILE REINFORCEMENT
Ductile reinforcement details	
Text Books:	
<ol style="list-style-type: none"> 1. Bhash C Sharma & Gurucharan Singh, “Civil Engineering Drawing”, Standard Publishers, 2005. 2. Ajeet Singh, “Working with AUTOCAD 2000 with updates on AUTOCAD 2001”, Tata- Mc Graw-Hill Company Limited, New Delhi, 2002. 3. Sham Tickoo Swapna D, “AUTOCAD for Engineers and Designers”, Pearson Education, 2009. 5. Balagopal and Prabhu, “Building Drawing and Detailing”, Spades publishing KDR building, Calicut, 1987. 	
Reference Books:	
<ol style="list-style-type: none"> 1. Malik R.S., Meo, G.S., “Civil Engineering Drawing”, Computech Publication Ltd New Asian, 2009. 2. Sikka, V.B., “A Course in Civil Engineering Drawing”, S. K. Kataria & Sons, 2013. 	