

Discipline :-	Semester :-	Name of the teaching faculty :-
Civil Engg.	4th	Sipun Kumar Sencha
Subject :-	No. of days / per week class	Semester from date :- 10/03/2022
Structural Design-I	allotted :- 05	To date :- 10/06/2022
		No. of weeks :- 16

Months	Weeks	class Day	Theory Topics
Mar	2nd	1st	Chapter No-1 :- * objectives of design & detailing.
		2nd	* state the difference methods of design of concrete structure.
	3rd	1st	* Introduction to reinforced concrete, R.C sections their behaviours, grades of concrete & steel.
		2nd	* Permissible stresses & assumption in working stress method (WSM)
		3rd	* Flexural design & analysis of singly reinforcement

Months	Weeks	Class Day	Theory Topics
		5th	→ Concept of under-reinforced, over-reinforced & balanced section.
		6th	* Advantages & disadvantages of WSM.
3rd		1st	* Reasons for its obsolescence.
		2nd	* Chapter No-2 :- → Definition, Advantages of LSM over WSM, IS Code, suggestions regarding design philosophy.
		3rd	→ Types of limit state partial safety factors for material strength.
		4th	→ Characteristics strength, characteristic load, design load, loading on structure as per IS 875.
		5th	→ Study of IS specification regarding spacing of reinforcement in slab, cover to reinforcement in slab.
		6th	→ Beam, column & footing, minimum reinforcement in

Months	Weeks	Class Day	Theory Topics
			slab.
	4th	1st	* Chapter No-3 :- → Limit state of collapse (Failure), Assumption, Stress-strain relationship for concrete and steel, neutral axis, stress.
		2nd	→ Stress block diagram & strain diagram for singly reinforced section.
		3rd	→ Concept of under-reinforced, over-reinforced & limit section, neutral axis co-efficient.
		4th	→ Limiting value of moment of resistance & limiting percentage of steel provided for limiting singly R.C. section.
		5th	→ Analysis & design: Determination of design constant, moment of resistance & area of steel for rectangular section.
		6th	→ Necessity of singly reinforced beam.

Months	Weeks	Class Day	Theory Topics
	5th	1st	→ Solve numerical problem.
		2nd	→ Solve numerical problem.
		3rd	→ Define doubly reinforced beam & necessity of doubly reinforced section.
		4th	→ Design of doubly reinforced beam & necessity of doubly reinforced section.
		5th	→ Design of neutral axis, moment of resistance.
May	1st	1st	→ Solve numerical problem.
	2nd	1st	→ Solve numerical problem.
		2nd	→ Class Test on chapter No. 1, 2, & 3.
		3rd	* Chapter No - 4 :- → Nominal Shear Stress in R.C section, design shear strength of concrete, maximum shear stress.
		4th	→ Design of shear reinforced
		5th	→ Maximum shear reinforcement, forms of shear reinforcement

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		6th	→ Bond & types of bond, bond stress, check for bond stress, development length in tension.
	3rd	1st	→ Development length in compression member. Anchorage value for hooks 90° bend & 45° bend, standards lapping of bars.
		2nd	→ Check for development length. Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in Shear.
		3rd	→ Design of shear reinforcement minimum shear reinforcement in beams.
		4th	→ Solve numerical problem.
		5th	→ Solve numerical problem.
		6th	→ Class test on chapter No - 4.
	4th	1st	* Chapter No - 5 → General features, advantages

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			effective width of flange as per IS:456-2000 code provisions.
		2nd	-> Singly reinforced T-beam analysis, stress-strain diagram, depth of neutral axis.
		3rd	-> Moment of resistance of T-beam section with neutral axis lying within the flange.
		4th	-> Simple numerical problems on deciding effective flange width, on finding moment of resistance of T-beam section with neutral axis lies within or upto the bottom of flange.
		5th	-> Solve numerical problem.
		6th	-> Solve numerical problem.
5th		1st	-> Solve numerical problem.
		2nd	-> Solve numerical problem.
		3rd	* Chapter No - 6 :- -> Define slab types of

Months	Weeks	Class Day	Theory Topics
			slab.
		4th	-> Design of simply supported one-way slabs for flexure & check for deflection.
		5th	-> Solve numerical problem.
		6th	-> Solve numerical problem.
	6th	1st	-> Solve numerical problem.
June	1st	1st	-> Design of one-way cantilever slabs and continuous slabs for flexure & check for deflection & check for development length & shear.
		2nd	-> Solve numerical problem.
		3rd	-> Solve numerical problem.
		4th	-> Solve numerical problem.
		5th	-> Design of two way simply supported slabs for flexure with corner free & lift.
	2nd	1st	-> Solve numerical problem.