

LESSON PLAN OF 4TH SEMESTER CIVIL ENGINEERING(2023-24)

Discipline: CE	Semester:-4 TH	Name of the Teaching Faculty- SAMAPIKA PATTNAIK
Subject:- STRUCTURAL DESIGN I	No of Days/per Week Class Allotted :-05	No. of Weeks : 20
Week	Class Day	Theory/ Practical Topics
1 st	1 st	Working stress method (WSM) Objectives of design and detailing.
	2 nd	State the different methods of design of concrete structures.
	3 rd	Introduction to reinforced concrete
	4 th	R.C. sections their behaviour
	5 th	Grades of concrete and steel
2 nd	1 st	Permissible stresses, assumption in W.S.M.
	2 nd	Basic concept of under reinforced ,over reinforced and balanced section
	3 rd	PROBLEM SOLVING
	4 th	Flexural design & analysis of singly and doubly reinforced rectangular sections.
	5 th	NUMERICAL PROBLEM SOLVING
3 rd	1 st	Limit state method (LSM) Definition, types of limit states, partial safety factors for materials strength
	2 nd	Characteristic strength, characteristic load, design load, loading on structure as per I.S. 875
	3 rd	I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing
	4 th	minimum reinforcement in slab, beam & column, lapping, anchorage
	5 th	effective span for beam & slab.
4 th	1 st	Analysis and design of singly reinforced sections (LSM) Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis
	2 nd	Stress block diagram and strain diagram for singly reinforced section.
	3 rd	Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient
	4 th	Numerical problems
	5 th	limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section
5 th	1 st	Numerical problems on determining design constants
	2 nd	Moment of resistance and area of steel for rectangular sections.
	3 rd	Numerical problem solving

	4 th	Analysis and design of doubly reinforced section (LSM) General features
	5 th	Necessity of providing doubly reinforced section, reinforcement limitations. Analysis of doubly reinforced section, strain diagram, stress diagram
7 th	1 st	Shear, Bond and Development Length (LSM) Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress
	2 nd	design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement
	3 rd	Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90° bend and 45° bend standards lapping of bars, check for development length.
	4 th	Numerical problem solving
	5 th	Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams
8 th	1 st	Determination of Development length required for tension reinforcement of cantilevers beam and slab, check for development length.
	2 nd	Analysis and Design of T-Beam (LSM) General features, advantages, effective width of flange as per IS: 456-2000 code provisions.
	3 rd	Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis
	4 th	Numerical problem solving
	5 th	Design of T-beam for moment and shear for neutral axis within or up to flange bottom.
9 th	1 st	Numerical problem solving
	2 nd	Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination)..
	3 rd	Numerical problem solving
	4 th	Design of Slab and Stair case (LSM) Design of simply supported one-way slabs for flexure check for deflection control and shear.
	5 th	Numerical problem solving
10 th	1 st	Numerical problem solving
	2 nd	Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear
	3 rd	Numerical problem solving
	4 th	Numerical problem solving
	5 th	Design of two-way simply supported slabs for flexure with corner free to lift
11 th	1 st	Numerical problem solving

	2 nd	Numerical problem solving
	3 rd	Design of dog-legged staircase and cantilever staircase.
	4 th	Numerical problem solving
	5 th	Numerical problem solving
12 th	1 st	Simple numerical problems on design of one-way simply supported slabs cantilever slab, two-way simply supported slab, dog-legged staircase and cantilever staircase
	2 nd	Numerical problem solving
	3 rd	Numerical problem solving
	4 th	Design of Axially loaded columns and Footings (LSM) Assumptions in limit state of collapse- compression.
	5 th	Definition and classification of columns, effective length of column
13 TH	1 st	Specification for minimum reinforcement; cover, maximum reinforcement
	2 nd	Number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.
	3 rd	Analysis and design of axially loaded short, square, rectangular columns with lateral ties only; check for short column and check for minimum eccentricity may be applied.
	4 th	Numerical problem solving
	5 th	Numerical problem solving
14 TH	1 st	Types of footing
	2 nd	Design of isolated square column footing for flexure
	3 rd	Design of isolated square column footing for shear
	4 th	Numerical problem solving
	5 th	Numerical problem solving
15 TH	1 st	Design of Strip footing for walls
	2 nd	Numerical problem solving
	3 rd	Numerical problem solving
	4 th	Previous year questions solving
	5 th	Previous year questions solving
16 TH	1 st	Numerical problem solving
	2 nd	Numerical problem solving
	3 rd	Numerical problem solving
	4 th	Previous year questions solving
	5 th	Previous year questions solving
17 TH	1 st	Design of Strip footing for walls
	2 nd	Numerical problem solving
	3 rd	Numerical problem solving
	4 th	Previous year questions solving

18 TH	5 th	Previous year questions solving
	1 st	Numerical problem solving
	2 nd	DOUBT CLEARING CLASS
	3 rd	DOUBT CLEARING CLASS
	4 th	DOUBT CLEARING CLASS
19 TH	5 th	DOUBT CLEARING CLASS
	1 st	Revision
	2 nd	Revision
	3 rd	Revision
	4 th	Revision
20 TH	5 th	Revision
	1 st	Revision
	2 nd	Revision
	3 rd	Revision
	4 th	Revision
	5 th	Revision

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