

BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

SUBJECT: STRUCTURAL DESIGN - I (TH-1)

FACULTY: MALABIKA PATRA

ACADEMIC SESSION: 2023-24 (SUMMER)

SEMESTER: 4TH

SECTION : B

Sd/-
HOD(Civil Engg.)

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Discipline: Civil Engineering	Semester: 4th B		Name of the teaching faculty: MALABIKA PATRA
Subject: STRUCTURAL DESIGN - I	No. of Days/ per week class allotted: 05 periods per week. (tues-1,wed-1,Tues-1 fri-1,and Sat-1periods)		Semester From Date: 16-01-2024 To Date: 26-04-2024 No. of weeks: 15 weeks
Week	Class Day	No of period available	Theory Topics
1ST	17/01/24	1	1. Working stress method (WSM) 1.1 Objectives of design and detailing. State the different methods of design of concrete structures.
	19/01/24	2	1.2 Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Permissible stresses, assumption in W.S.M.
	22/01/24	2	1.3 Flexural design and analysis of single reinforced sections from first principles.
	24/01/24	1	1.4 Concept of under reinforced, over reinforced and balanced sections.
	29/01/24	2	1.5 Advantages and disadvantages of WSM, reasons for its obsolescence
2ND	31/01/24	1	2. Philosophy Of Limit State Method (LSM) 2.1 Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy.
	02/02/24	2	2.2 Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 875
3RD	05/02/2024	2	2.3 Study of I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab. 3 Analysis and Design of Single and Double Reinforced Sections (LSM) 3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel,.

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	07/02/2024	1	3.1 Neutral axis, stress block diagram and strain diagram for singly reinforced section
	09/02/2024	2	3.2 limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section
	12/02/2024	2	3.3 Analysis and design: determination of design constants for rectangular sections, Moment of resistance and area of steel for rectangular sections
	16/02/2024	2	3.4 Necessity of doubly reinforced section,
4 TH	19/02/2024	2	3.4 Design of doubly reinforced rectangular section
	21/02/2024	1	CLASS TEST-1
	23/02/2024	2	3.4 design of doubly reinforced rectangular section
	26/02/2024	2	4 Shear, Bond and Development Length (LSM)
	28/02/2024	1	4.1 Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement
5 TH	01/03/2024	2	4.2 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 90 degree bend and 45 degree bend standards lapping of bars, check for development length.
	04/03/2024	2	4.3 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
	06/03/2024	1	4.3 Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear.
	11/03/2024	2	4.3 Design of shear reinforcement; Minimum shear reinforcement in beams

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6TH	13/03/2024	1	5 Analysis and Design of T-Beam (LSM) 5.1 General features, advantages, effective width of flange as per IS: 456-2000 code provisions.
	15/03/2024	2	5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis
	18/03/2024	2	5.2 moment of resistance of T-beam section with neutral axis lying within the flange
	20/03/2024	1	5.3 Simple numerical problems on deciding effective flange width
	22/03/2024	2	5.3 Simple numerical problems on deciding effective flange width
7TH	27/03/2024	1	6 Analysis and Design of Slab and Staircase (LSM) 6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear.
	28/02/2024	1	6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear.
	29/02/2024	1	CLASS TEST-2
	01/03/2024	1	6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear.
	02/03/2024	1	6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.
8TH	04/03/2024	1	6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.
	06/03/2024	1	6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.
	07/03/2024	1	6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.
	09/03/2024	1	6.3 Design of two-way simply supported slabs for flexure with corner free to lift
9TH	12/03/2024	1	6.3 Design of two-way simply supported slabs for flexure with corner free to lift
	14/03/2024	1	6.3 Design of two-way simply supported slabs for flexure with corner free to lift

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	15/03/2024	1	6.4 Design of dog-legged staircase
	16/03/2024	1	6.4 Design of dog-legged staircase
10TH	19/03/2024	1	6.4 Design of dog-legged staircase
	20/03/2024	1	
	21/03/2024	1	6.5 Detailing of reinforcement in stairs spanning longitudinally
	22/03/2024	1	6.5 Detailing of reinforcement in stairs spanning longitudinally
	23/03/2024	1	7 Design of Axially loaded columns and Footings (LSM) 7.1 Assumptions in limit state of collapse- compression.
11TH	27/03/2024	1	CLASS TEST-3
	03/04/2024	1	INTERNAL ASSESSMENT
	05/04/2024	2	INTERNAL ASSESSMENT
12TH	08/04/2024	2	7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties
	10/04/2024	1	7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties
	12/04/2024	2	7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties

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	15/04/2024	2	7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties
	19/04/2024	2	7.2 Maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties
13TH	22/04/2024	2	7.3 Analysis and design of axially loaded short square column(with lateral ties only)
	24/04/2024	1	7.3 Analysis and design of axially loaded short square column(with lateral ties only)
	26/04/2024	2	7.4 Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.
	26/04/2024	1	7.4 Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.