

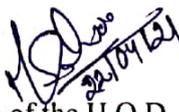
LESSON PLAN OF 4th SEMESTER(2019-22) CIVIL ENGINEERING

Discipline :- CIVIL	Semester:- 4 th	Name of the Teaching Faculty:- MRS.MADHUSMITA SAHOO
Subject:- Structural Design-1 TH 1	No of Days/per Week Class Allotted :- 05	Semester From:- <u>19th Apr, 2021</u> To:- <u>13th Aug, 2021</u> No of Weeks:- 17 ONLINE CLASS
Week	Class Day	Theory Topics
1 st	1 st	1.0 Working stress method (WSM) 1.1 Objectives of design and detailing.
	2 nd	State the different methods of design of concrete structures.
	3 rd	1.2 Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete
	4 th	and steel Permissible stresses, assumption in W.S.M.
	5 th	1.3 Basic concept of under reinforced, over reinforced and balanced section
2 nd	1 st	1.4 flexural design & analysis of singly and doubly reinforced rectangular sections.
	2 nd	Numerical problems on Balanced section
	3 rd	Numerical problems on Balanced section
	4 th	Numerical problems on under reinforced section
	5 th	Numerical problems on under reinforced section
3 rd	1 st	Numerical problems on over reinforced section
	2 nd	Numerical problems on over reinforced section
	3 rd	2.0 Limit state method (LSM) 2.1 Definition, types of limit states, partial safety factors for materials strength.
	4 th	Characteristic load, design load, loading on structure 2.2 I.S specification regarding spacing of reinforcement in slab,
	5 th	Cover to reinforcement in slab Beam column & footing, minimum reinforcement in slab.
4 th	1 st	Beam & column, lapping, anchorage
	2 nd	Effective span for beam & slab.
	3 rd	3.0 Analysis and design of singly reinforced sections (LSM) and doubly reinforced section (LSM) 3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis.
	4 th	Stress block diagram and strain diagram for singly reinforced section.
	5 th	3.2 Concept of under- reinforced, over-reinforced and limiting section
5 th	1 st	Neutral axis co-efficient,
	2 nd	Limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.
	3 rd	Numerical problems on determining design constants
	4 th	Numerical problems on determining design constants
	5 th	Numerical problems on determining design constants
6 th	1 st	Moment of resistance and area of steel for rectangular sections.
	2 nd	Numerical problems on Moment of Resistance.
	3 rd	3.3 General features, necessity of providing doubly reinforced section, reinforcement limitations

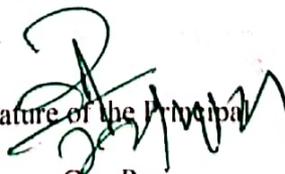
	4 th	3.4 Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis
	5 th	Moment of resistance of the rectangular section.
7 th	1 st	3.5 Numerical problems on finding moment of resistance and design of beam sections.
	2 nd	Numerical problems
	3 rd	Numerical problems
	4 th	4.0 Shear, Bond and Development Length (LSM) 4.1 Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress,
	5 th	Design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.
8 th	1 st	4.2 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression,
	2 nd	Anchorage value for hooks 90° bend and 45° bend standards lapping of bars check for development length.
	3 rd	4.3 Numerical problems on deciding whether shear reinforcement are required or not, check for adequacy of the section in shear. Design of shear reinforcement;
	4 th	Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beam and slab, check for development length.
	5 th	5.0 Analysis and Design of T-Beam (LSM) 5.1 General features, advantages, effective width of flange as per IS: 456-2000 code provisions.
9 th	1 st	5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis
	2 nd	Moment of resistance of T-beam section with neutral axis lying within the flange.
	3 rd	5.3 Design of T-beam for moment and shear for neutral axis within or up to flange bottom
	4 th	5.4 Simple numerical problems on deciding effective flange width.
	5 th	Problems on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange
10 th	1 st	Simple numerical problems
	2 nd	Simple numerical problems
	3 rd	6.0 Analysis and Design of Slab and Stair case (LSM) 6.1 Design of simply supported one-way slabs for flexure
	4 th	Check for deflection control and shear.
	5 th	6.2 Design of one-way cantilever slabs for flexure
11 th	1 st	Check for deflection control and check for development length and shear.
	2 nd	Design of cantilevers chajjas for flexure
	3 rd	Check for deflection control and check for development length and shear.
	4 th	Simple numerical problems on design of one-way simply supported slabs
	5 th	Simple numerical problems on design of cantilever slab
12 th	1 st	6.3 Design of two-way simply supported slabs for flexure with corner free to lift
	2 nd	Simple numerical problems on design of two-way simply supported slab
	3 rd	6.4 Design of dog-legged staircase
	4 th	Simple numerical problems on dog-legged staircase
	5 th	Design of cantilever staircase.
13 th	1 st	Simple numerical problems on cantilever staircase
	2 nd	7.0 Design of Axially loaded columns and Footings (LSM)

		7.1 Assumptions in limit state of collapse- compression. 7.2 Definition and classification of columns
	3 rd	Length of column. Specification for minimum reinforcement; cover, maximum reinforcement
	4 th	Number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.
	5 th	7.3 Analysis and design of axially loaded short column with lateral ties only
14 th	1 st	Analysis and design of axially loaded square column with lateral ties only
	2 nd	check for short column and check for minimum eccentricity
	3 rd	Analysis and design of axially loaded rectangular columns with lateral ties only
	4 th	Analysis and design of axially loaded circular with lateral ties only
	5 th	7.4 Types of footing
15 th	1 st	Design of isolated square column footing for flexure and shear
	2 nd	Design of Strip footing for walls.
	3 rd	7.5 Simple numerical problems on axially loaded short columns
	4 th	Simple numerical problems on isolated footings.
	5 th	Simple numerical problems on wall footings.
16 th	1 st	DOUBT CLEARING CLASS AND REVISION & DISCUSSION
	2 nd	
	3 rd	
	4 th	
	5 th	
17 th	1 st	DOUBT CLEARING CLASS AND REVISION & DISCUSSION
	2 nd	
	3 rd	
	4 th	
	5 th	

Madhusmita Sahoo.
Signature of the concerned Lecturer


Signature of the H.O.D


Signature of Academic Coordinator


Signature of the Principal
G.p, Puri