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

Discipline :- CIVIL	Semester:- 4th	Name of the Teaching Faculty:- MRS.MADHUSMITA SAHOO
Subject:- Structural Design-1 TH 1	No of Days/per Week Class Allotted :- 05	Semester From:- 19th Apr, 2021 To:- 13th Aug, 2021 No of Weeks:- 17 ONLINE CLASS

Week	Class Day	Theory Topics
1st	1st	**1.0 Working stress method (WSM)** 1.1 Objectives of design and detailing.
	2nd	State the different methods of design of concrete structures.
	3rd	1.2Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete
	4th	and steel Permissible stresses, assumption in W.S.M.
	5th	1.3Basic concept of under reinforced, over reinforced and balanced section
2nd	1st	1.4flexural design & analysis of singly and doubly reinforced rectangular sections.
	2nd	Numerical problems on Balanced section
	3rd	Numerical problems on Balanced section
	4th	Numerical problems on under reinforced section
	5th	Numerical problems on under reinforced section
3rd	1st	Numerical problems on over reinforced section
	2nd	Numerical problems on over reinforced section
	3rd	**2.0 Limit state method (LSM)** 2.1Definition, types of limit states, partial safety factors for materials strength.
	4th	Characteristic load, design load, loading on structure 2.2 I.S specification regarding spacing of reinforcement in slab,
	5th	Cover to reinforcement in slab Beam column & footing, minimum reinforcement in slab.
4th	1st	Beam & column, lapping, anchorage
	2nd	Effective span for beam & slab.
	3rd	**3.0Analysis 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.
	4th	Stress block diagram and strain diagram for singly reinforced section.
	5th	3.2 Concept of under- reinforced, over-reinforced and limiting section
5th	1st	Neutral axis co-efficient,
	2nd	Limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.
	3rd	Numerical problems on determining design constants
	4th	Numerical problems on determining design constants
	5th	Numerical problems on determining design constants
6th	1st	Moment of resistance and area of steel for rectangular sections.
	2nd	Numerical problems on Moment of Resistance.
	3rd	3.3 General features, necessity of providing doubly reinforced section, reinforcement limitations

	4th	3.4 Analysis of doubly reinforced section, strain diagram, stress diagram, depth of neutral axis
	5th	Moment of resistance of the rectangular section.
7th	1st	3.5 Numerical problems on finding moment of resistance and design of beam sections.
	2nd	Numerical problems
	3rd	Numerical problems
	4th	**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,
	5th	Design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.
8th	1st	4.2 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression,
	2nd	Anchorage value for hooks 90^0 bend and 45^0 bend standards lapping of bars check for development length.
	3rd	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;
	4th	Minimum shear reinforcement in beams; Determination of Development length required for tension reinforcement of cantilevers beam and slab, check for development length.
	5th	**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.
9th	1st	5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis
	2nd	Moment of resistance of T-beam section with neutral axis lying within the flange.
	3rd	5.3 Design of T-beam for moment and shear for neutral axis within or up to flange bottom
	4th	5.4 Simple numerical problems on deciding effective flange width.
	5th	Problems on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange
10th	1st	Simple numerical problems
	2nd	Simple numerical problems
	3rd	**6.0 Analysis and Design of Slab and Stair case (LSM)** 6.1 Design of simply supported one-way slabs for flexure
	4th	Check for deflection control and shear.
	5th	6.2 Design of one-way cantilever slabs for flexure
11th	1st	Check for deflection control and check for development length and shear.
	2nd	Design of cantilevers chajjas for flexure
	3rd	Check for deflection control and check for development length and shear.
	4th	Simple numerical problems on design of one-way simply supported slabs
	5th	Simple numerical problems on design of cantilever slab
12th	1st	6.3 Design of two-way simply supported slabs for flexure with corner free to lift
	2nd	Simple numerical problems on design of two-way simply supported slab
	3rd	6.4 Design of dog-legged staircase
	4th	Simple numerical problems on dog-legged staircase
	5th	Design of cantilever staircase.
13th	1st	Simple numerical problems on cantilever staircase
	2nd	**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
	3rd	Length of column. Specification for minimum reinforcement; cover, maximum reinforcement
	4th	Number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties.
	5th	7.3 Analysis and design of axially loaded short column with lateral ties only
14th	1st	Analysis and design of axially loaded square column with lateral ties only
	2nd	check for short column and check for minimum eccentricity
	3rd	Analysis and design of axially loaded rectangular columns with lateral ties only
	4th	Analysis and design of axially loaded circular with lateral ties only
	5th	7.4 Types of footing
15th	1st	Design of isolated square column footing for flexure and shear
	2nd	Design of Strip footing for walls.
	3rd	7.5 Simple numerical problems on axially loaded short columns
	4th	Simple numerical problems on isolated footings.
	5th	Simple numerical problems on wall footings.
16th	1st	**DOUBT CLEARING CLASS AND REVISION & DISCUSSION**
	2nd	
	3rd	
	4th	
	5th	
17th	1st	**DOUBT CLEARING CLASS AND REVISION & DISCUSSION**
	2nd	
	3rd	
	4th	
	5th	

Madhusmita Sahoo.
Signature of the concerned Lecturer

22/04/24
Signature of the H.O.D

22/4/24
Signature of Academic Coordinator

Signature of the Principal
G.p, Puri