GANDHI SCHOOL OF ENGINEERING
BHABANDHA, BERHAMPUR

BRANCH- CIVIL ENGINEERING

SEMESTER- 4th
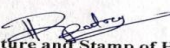
SUBJECT- Th1. STRUCTURAL DESIGN – I

NAME OF THE FACULTY- Er. SAGAR PRIYA SAHU

			TOPICS TO BE TAKEN			ACTUALLY TOPIC TAKEN	
Sl. No	Topic/Module	No of Periods	Details of the Topics	Date	Topic no.	Topic Name	Date
1	Working stress method (WSM)	5	1.1 Objectives of design and detailing. State the different methods of design of concrete structures. 1.2 Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. 1.3 Flexural design and analysis of single reinforced sections from first principles. 1.4 Concept of under reinforced, over reinforced and balanced sections. 1.5 Advantages and disadvantages of WSM, reasons for its obsolescence.	16.01.2024-20.01.2024	1.1 1.2 1.3 1.4 1.5	Objectives of design and detailing. State the different methods of design of concrete structures. Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Flexural design and analysis of single reinforced sections from first principles. Concept of under reinforced, over reinforced and balanced sections. Advantages and disadvantages of WSM, reasons for its obsolescence.	18.01.2024 19.01.2024 22.01.2024 24.01.2024 25.01.2024
2	Philosophy of Limit state method (LSM)	3	2.1 Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy. 2.2 Types of limit states, partial safety factors for materials strength etc. 2.3 Study of I.S specification regarding spacing of reinforcement in slab.	22.01.2024-25.01.2024	2.1 2.2 2.3	Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy. Types of limit states, partial safety factors for materials strength etc. Study of I.S specification regarding spacing of reinforcement in slab.	31.01.2024 01.02.2024 02.02.2024

3	Analysis and design of singly and double reinforced sections (LSM)	15	3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel section etc. 3.2 Concept of under- reinforced, over-reinforced and limiting section, 3.3 Analysis and design. 3.4 Necessity of doubly reinforced section.	31.01.2024-16.02.2024	3.1 3.2 3.3 3.4	Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel section etc. Concept of under- reinforced, over-reinforced and limiting section, Analysis and design. Necessity of doubly reinforced section.	05.02.2024 06.02.2024 07.02.2024 08.02.2024 09.02.2024 13.02.2024 15.02.2024 16.02.2024 19.02.2024 20.02.2024 21.02.2024 22.02.2024
4	Shear, Bond and Development Length (LSM)	4	4.1 Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress. 4.2 Bond and types of bond, bond stress, check for bond stress. 4.3 Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear.	19.02.2024-22.02.2024	4.1 4.2 4.3	Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress. Bond and types of bond, bond stress, check for bond stress. Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear.	23.02.2024 26.02.2024 27.02.2024 28.02.2024
5	Analysis and Design of T-Beam (LSM)	15	5.1 General features, advantages, effective width of flange as per IS: 456-2000 code provisions. 5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram etc. 5.3 Simple numerical problems on deciding effective flange width.	23.02.2024-13.03.2024	5.1 5.2 5.3	General features, advantages, effective width of flange as per IS: 456-2000 code provisions. Analysis of singly reinforced T-Beam, strain diagram & stress diagram etc. Simple numerical problems on deciding effective flange width.	29.02.2024 01.03.2024 04.03.2024 06.03.2024 07.03.2024 11.03.2024 12.03.2024 13.03.2024 14.03.2024 27.03.2024

6	Analysis and Design of Slab and Stair case (LSM)	15	6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear. 6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear. 6.3 Design of two-way simply supported slabs for flexure with corner free to lift. 6.4 Design of dog-legged staircase 6.5 Detailing of reinforcement in stairs spanning longitudinally.	14.03.2024-04.04.2024	6.1 6.2 6.3 6.4 6.5	Design of simply supported one-way slabs for flexure check for deflection control and shear. Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear. Design of two-way simply supported slabs for flexure with corner free to lift. Design of dog-legged staircase Detailing of reinforcement in stairs spanning longitudinally.	28.03.2024 02.04.2024 03.04.2024 05.04.2024 08.04.2024 09.04.2024 10.04.2024 12.04.2024
7	Design of Axially loaded columns and Footings (LSM)	18	7.1 Assumptions in limit state of collapse-compression. 7.2 Definition and classification of columns, effective length of column. 7.3 Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only). 7.4 Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	05.04.2024-26.04.2024	7.1 7.2 7.3 7.4	Assumptions in limit state of collapse- compression. Definition and classification of columns, effective length of column. Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only). Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	15.04.2024 16.04.2024 18.04.2024 19.04.2024 22.04.2024 23.04.2024 24.04.2024 25.04.2024

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