# LESSON PLAN

## Academic Session :- 2023-2024 (2024 Summer)

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| **Discipline: Civil.Engineering** | Name of teaching faculty: Swagatika Dani |
| **Subject: Structural Design-1(TH1)** | **Semester from Date:16/01/2024 to 26/04/2024** |
| Semester: 4th | **No. of weeks: 14** **5P/week** |
| No. of Days/ week class allotted: 05period per week( Monday-1P, Wednesday-2P, Thursday-1P, Friday-1P) | **Total period: 75** |

| MONTH | Week | DATE | DAYS/PERIOD | Syllabus to be covered | NO. OF PERIODS AVAILABLE |
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| | | | | **CHAPTER:1:WORKING STRESS METHOD(WSM)5P** | 5 |
| JANUARY | 3RD | 17/01/2024 | Wednesday | 1.1.Objective of design and detailing. state the different method of design of concrete structures. | 1 |
| | | 17/01/2024 | Wednesday | 1.2.Introduction to reinforced concrete, R.C. sections their behaviour, grades of concrete and steel. Permissible stresses, assumption in WSM | 1 |
| | | 18/01/2024 | Thursday | 1.3. Flexural design and analysis of single reinforced sections from first principles. | 1 |
| | | 19/01/2024 | Friday | 1.4.Concept of under reinforced, over reinforced and balanced sections | 1 |
| | 4TH | 22/01/2024 | Monday | 1.5. Advantages and disadvantages of WSM, reasons for its obsolescence | 1 |
| | | | | **CHAPTER:2: Philosophy of limit state Method(LSM). 3P** | **3** |
| | | 24/01/2024 | Wednesday | 2.1. Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy | 1 |
| | | 24/01/2024 | Wednesday | 2.2. Type of limit states, partial safety factors for material strength, characteristic load, design load,loading on structure as per I.S. 875 | 1 |
| | | 25/01/2024 | Thursday | 2.3.Study of I.S. specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column and footing, minimum reinforcement in slab, beam and column lapping, anchorage, effective span for beam and slab | 1 |

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| | | | | **CHAPTER:3: Analysis and Design of Single and double Reinforced section (LSM) 15P** | **15** |
| | | 29/01/2024 | Monday | 3.1.limit state of collapse( flexure), Assumptions, Stress-Strain relationship for concrete | 1 |
| | | 31/01/2024 | Wednesday | 3.2.Stress-Strain relationship for steel, neutral axis, stress block diagram for single reinforced section | 1 |
| | **5TH** | 31/01/2024 | Wednesday | 3.3.Stain diagram for singly reinforced section; Concept of under reinforced, over reinforced and limiting section. | 1 |
| **FEBRUARY** | | 01/02/2024 | Thursday | 3.4. Neutral axis coefficient, limiting value of moment of resistance. | 1 |
| | **1ST** | 02/02/2024 | Friday | 3.5. limiting percentage of steel required for limiting single R.C. section | 1 |
| | | 05/02/2024 | Monday | 3.6.Analysis and design:Determination of design constants. Moment of resistance and area of steel for rectangular sections | 1 |
| | | 07/02/2024 | Wednesday | 3.7. Numericals | 1 |
| | | 07/02/2024 | Wednesday | 3.8.Numericals | 1 |
| | | 08/02/2024 | Thursday | 3.9. Numericals | 1 |
| | **2ND** | 09/02/2024 | Friday | 3.10.Numericals | 1 |
| | | 12/02/2024 | Monday | 3.11. Necessity of doubly reinforced section, Design of doubly reinforced rectangular section | 1 |
| | | 15/02/2024 | Thursday | 3.12.Numericals | 1 |
| | **3RD** | 16/02/2024 | Friday | 3.13. Numericals | 1 |
| | | 19/02/2024 | Monday | 3.14.Numericals | 1 |
| | | 21/02/2024 | Wednesday | 3.15.Numericals. | 1 |
| | | | | **CHAPTER: 4: Shear, Bond and Development length( LSM)-04P** | **4** |
| | | 21/02/2024 | Wednesday | 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 | 1 |
| | | 22/02/2024 | Thursday | 4.2. Bond and types of bond, bond stress, check for bond stress, development length in tension and compression | 1 |
| | **4TH** | 23/02/2024 | Friday | 4.3. Anchorage value for hooks 90 degree bend and 45degree bend standards lapping of barsa, check for development length. | 1 |
| | | 26/02/2024 | Monday | 4.4.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( Explain through examples only) | 1 |

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| | | | | **CHAPTER:5:ANALYSIS AND DESIGN OF T-BEAM(LSM)-15P** | **15** |
| | | 28/02/2024 | Wednesday | 5.1.General features, advantages | 1 |
| | | 28/02/2024 | Wednesday | 5.2.Effective width of flange as per I.S. 456-2000 code provisions | 1 |
| | **5TH** | 29/02/2024 | Thursday | 4.2.Buckling class of cross sections | 1 |
| | **1ST** | 01/03/2024 | Friday | 5.3.Analysis of singly reinforced T-beam | 1 |
| | | 04/03/2024 | Monday | 5.4. stress diagram and strain diagram | 1 |
| | | 06/03/2024 | Wednesday | 5.5.Depth of neutral axis | 1 |
| | | 06/03/2024 | Wednesday | 5.6.Moment of resistance of T-beam section with neutral axis lying within the flange | 1 |
| | **2ND** | 07/03/2024 | Thursday | 5.7.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) | 1 |
| | | 11/03/2024 | Monday | 5.8. Numericals | 1 |
| | | 13/03/2024 | Wednesday | 5.9.Numericals | 1 |
| | | 13/03/2024 | Wednesday | 5.10. Numericals | 1 |
| **MARCH** | | 14/03/2024 | Thursday | 5.11.Numericals | 1 |
| | **3RD** | 15/03/2024 | Friday | 5.12.Numericals | 1 |
| | | 18/03/2024 | Monday | 5.13 Numericals | 1 |
| | | 20/03/2024 | Wednesday | 5.14. Numericals | 1 |
| | | 20/03/2024 | Wednesday | 5.15.Class test | 1 |
| | | | | **CHAPTER:6.ANALYSIS AND DESIGN OF SLAB AND STAIR CASE(LSM)-15P** | **15** |
| | | 21/03/2024 | Thursday | 6.1.Design of simply supported one -way slabs for flexure check for deflection control and shear. | 1 |
| | **4TH** | 22/03/2024 | Friday | 6.2.Numericals | 1 |
| | | 27/03/2024 | Wednesday | 6.3.Numericals | 1 |
| | | 27/03/2024 | Wednesday | 6.4.Design of one-way cantilever slabs and cantilevers chajjas for flexure check deflection control | 1 |
| | **5TH** | 28/03/2024 | Thursday | 6.5.Check for development length and shear | 1 |
| | | 03/04/2024 | Wednesday | 6.6.Numericals | 1 |
| | | 03/04/2024 | Wednesday | 6.7.Numericals | |
| | | 04/04/2024 | Thursday | 6.8.Design of two-way simply supported slabs for flexure with corner free to lift | 1 |
| | **1ST** | 05/04/2024 | Friday | 6.9.Numericals | 1 |
| | | 08/04/2024 | Monday | 6.10.Design of dog-legged staircase | 1 |
| | | 10/04/2024 | Wednesday | 6.11. Numericals | 1 |
| | | 10/04/2024 | Wednesday | 6.12. Numericals | 1 |
| | **2ND** | 12/04/2024 | Friday | 6.13. Detailing of reinforcement in stairs spanning longitudinally | 1 |
| | | 15/04/2024 | Monday | 6.14. Numericals | 1 |
| **APRIL** | | 18/04/2024 | Thursday | 6.15. Numericals | 1 |

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| | | | | **CHAPTER:7.DESIGN OF AXIALLY LOADED COLUMNS AND FOOTINGS(LSM)18P** | **18** |
| | **3RD** | 19/04/2024 | Friday | 7.1. Assumption in limit state of collapse-compression | 1 |
| | | 22/04/2024 | Monday | 7.2.Definition and classification of columns | 1 |
| | | 24/04/2024 | Wednesday | 7.3.effective length of column, cover | 1 |
| | | 24/04/2024 | Wednesday | 7.4.Specification for minimum reinforcements | 1 |
| | | 25/04/2024 | Thursday | 7.5.Maximum reinforcement | 1 |
| | **4TH** | 26/04/2024 | Friday | 7.6.Number of bars in rectangular, square section | 1 |
| | | | | 7.7.Number of bars in Circular sections | 1 |
| | | | | 7.8.Diameter and spacing of lateral ties | 1 |
| | | | | 7.9.Analysis and design of axially loaded short square, rectangular columns | 1 |
| | | | | 7.10.Analysis and design of axially loaded circular columns( with lateral ties only) | 1 |
| | | | | 7.11.Type of footing | 1 |
| | | | | 7.12.Design of isolated square column footing of uniform thickness for flexure and shear | 1 |
| | | | | 7.13.Design of isolated square column footing of uniform thickness for flexure and shear | 1 |
| | | | | 7.14.Numericals | 1 |
| | | | | 7.15. Numericals | 1 |
| | | | | 7.16. Numericals | 1 |
| | | | | 7.17.Numericals | 1 |
| | | EXTRA CLASS | | 7.18.Class test | 1 |
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