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Course Type	Course Code	Name of Course	L	Т	Р	Credit	
DC	CEC301	Structural Analysis-II	3	0	0	9	
Course Objective							

Advanced analysis of indeterminate structures will be focused in this course. Further, exposure to software will also be emphasized.

Learning Outcomes

After studying this course, students should be able to:

- Have exposure towards analysis of indeterminate structures.
- Carry out Sway analysis of frames important for design of multi-storey building.
- Software based analysis of structures

Unit No.	Topics to be Covered	Lectures	Learning Outcome
1	Introduction to ILD: Use of influence line diagrams, application to determinate structures	3	Understanding effect of moving load and procedure to plot ILD
2	Application of ILD in indeterminate structures: Influence lines for statically indeterminate structures, Muller-Breslau principle with application to determinate and redundant structures, Qualitative ILD for continuous beams and frames.	6	Structural behavior under rolling loads by qualitative ILD, ILD of indeterminate beams/bridge-girders loaded with concentrated and uniformly distributed loads
3	Slope-deflection method: Basic principles, slope deflection method for beams and frame with/without sway.	7	Development of stiffness factors, advantages and use of displacement based slope-deflection method of analysis in continuous beams and plane frames
4	Moment distribution method : Basic principles, Moment distribution method for beams and frame with/without sway, use of symmetry and anti-symmetry.	8	Idea of distribution factors, carry over moment and use of symmetry/anti- symmetry for analysis of continuous beams and plane frames
5	Direct stiffness method: Basic principles, application to planar structures - trusses, beams and frames, Analysis for temperature stress, lack of fit and settlement of supports, solution of algebraic equations: linear and nonlinear equations.	12	Developing element stiffness matrix, local and global co-ordinate system, assembly, boundary conditions and solution procedure.
6	Software application: Introduction to software and its applications to 2D trusses and frames.	6	Use of worksheet and elementary programming for application of structural analysis methods, introduction to commercial software

Recommended Text Books:

1. Wang, C. K., "Indeterminate Structural Analysis", Tata McGraw Hill Publishing.

2. Kinney, J.S., "Indeterminate Structural Analysis", Oxford IBH Publishing Company.

Recommended References:

- 1. Ghali, A. and Neville, A. M., "Structural Analysis (Unified Classical and Matrix Approach)", 5th Edition, Chapman and Hall, Ltd.
- 2. Weaver, W., and Gere, J.M., "Matrix Framed Structures", CBS Publishers, Delhi
- 3. Hibbeller, R. C., "Structural Analysis", 6th Edition, Pearson Education