CE 432: Advanced Structural Analysis
B. Tech. (Civil Engg.) Seventh Semester (Professional Core Elective- II)
L T P C: 3 1 0 4

Prerequisites: Structural Analysis- III (CE 309)

Unit-1 Introduction of Matrix Method of Structural Analysis: Static and kinematics indeterminacy of structures; Fundamentals of Flexibility and Stiffness method; Basic examples of application of Flexibility and Stiffness Method.

Unit-2 Direct Stiffness Matrix Method: Derivation of local stiffness matrices for prismatic and non-prismatic members, transformation matrices and global stiffness matrices, assembling, compatibility equation. Application of Matrix Displacement Method to plane truss, space truss, beams, grids, plane frames and space frames subjected to various loadings including effects of temperature change and support displacements, Applications of software in structural analysis.

Unit-3 Navier Method and Levy's method of analysis of slabs due to different loading conditions.

Unit-4 Analysis of Circular Slabs, Spherical Domes.

Text Books / Reference Books:
1. Weaver W. and Gere J. Matrix Analysis of Framed Structures. CBS Publishers & Distributors, Delhi.
2. Hibbler R.C. Structural Analysis. Pearson Education, Asia.
3. Wang, C.K. Intermediate Structural Analysis. McGraw-Hill.
4. CS Reddy. Basic Structural Analysis. McGraw Hill Education.
5. Rajasekharan S. and Sankarasubramanian G. Computational Structural Mechanics. PHI, New Delhi.

Course Outcomes (COs):
At the end of the course, students are expected to
1. Develop a comprehensive understanding of matrix methods of structural analysis.
2. Develop the understanding of fundamental principles of Finite Element Method.
3. Extend the analysis skill for special structure.
4. Develop the understanding of non - linear analysis of structures.
5. Ability for structural analysis using computer software.