

FINITE ELEMENT METHODS IN ENGINEERING

MODULE 1:

Basic Concepts: The standard discrete system, Finite Elements of an elastic continuum displacement approach, Generalization of the finite element concepts-weighted residual and variational approaches,

MODULE 2:

Element types: triangular, quadrilateral, sector, curved, isoparametric elements and numerical integration. Automatic mesh generation schemes.

MODULE 3:

Application to structural mechanics problems: plane stress and plane strains, Axisymmetric stress analysis, three dimensional stress analysis, bending of plates.

MODULE 4:

Introduction to the use of FEM in steady state field problems – heat conduction, fluid flow and nonlinear material problems, plasticity, creep etc. Computer procedures for Finite element analysis.

Text Books:

1. Finite Element Method: Its Basis and Fundamentals. O. C. Zienkiewicz, R. L. Taylor and J. Z. Zhu. Elsevier, 2005.
2. Finite Element Methods – J. N. Reddy. Tata Mc-Graw Hill.
3. Introduction to the Finite Element Method–C.S. Desai & J.F.Abel .East West Pvt. Ltd., 1972