MT-513	Finite Element Analysis
	Introduction: Historical background, Matrix approach, Discretisation, Matrix algebra, Gaussian elimination, Governing equations, Classical techniques in FEM, Weighted residual method, Ritz method. One Dimensional Problem: Finite element modelling coordinates and shape functions, Interpolation function, Potential energy approach, Galerkin approach, Assembly of stiffness matrix and load vector, Finite element equations, Quadratic shape functions, Applications to plane trusses. Two Dimensional Problems: Introduction , Finite element modelling , Scalar valued problem , Poisson equation, Laplace equation, Triangular elements , Element stiffness matrix, Force vector, Galarkin approach , Stress calculation , Temperature effects. Axisymmetric: Axisymmetric formulation, Element stiffness matrix and force vector, Galarkin approach, Body forces and temperature effects, Stress calculations, Boundary conditions, Applications to cylinders under internal or external pressures, Rotating discs. Reference Books: 1. Moaveni S, *Finite Element Analysis Theory and Application with ANSYS: International Edition,* 3rd Edition, Pearson Education, 2008. 2. Chandrupatla T.R and Belegundu A.D, *Introduction to Finite Elements in Engineering,* 3rd Edition, Pearson Education, 2002. 3. Zienkiewicz, O.C and Taylor R.L, *The Finite Element Methods: The Basic Formulation and Linear Problems*, 5th Edition, Butterworth Heineman, 2000.