



Department of AERONAUTICAL ENGINEERING



FINITE ELEMENT ANALYSIS

(R20A2137) COURSE COVERAGE SUMMARY

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B.TECH II – III SEMESTER - COURSE COVERAGE SUMMARY SUBJECT: Finite Element Analysis (R20A2137)

UNIT	TITLE OF THE UNIT	TOPIC OF THE UNIT	NAME OF THE TEXT BOOK	CHAPTER NO.	PAGE NO.
1	Introduction to Finite Element Method	Introduction to Finite Element Method for solving field problems. Stress and Equilibrium. Strain – Displacement relations. Stress – strain relations. One Dimensional problems: Finite element modeling coordinates and shape functions. Potential Energy approach: Assembly of Global stiffness matrix and load vector. Finite element equations, Treatment of boundary conditions,	"Finite Element Analysis" by S.Md. Jalaludeen	1,2,6,7	1.1- 1.12, 2.3-2.7, 6.1-7.70
2	Analysis of Beams & Trusses	Quadratic shape functions. Analysis of Beams: Element stiffness matrix for two node, two degrees of freedom per node beam element. Analysis of Trusses: Stiffness matrix for plain truss elements, stress calculations and problems.	"Finite Element Analysis" by S.Md. Jalaludeen	8,9	8.1-9.39
3	Finite element modeling of two dimensional element	Finite element modelling of two dimensional stress analysis with constant strain triangles and treatment of boundary conditions. Finite element modelling of Axisymmetric solids subjected to Axisymmetric loading with triangular elements. Two dimensional four noded isoparametric elements and numerical integration.	"Finite Element Analysis" by S.Md. Jalaludeen	11,12,13,14	11.1- 14.66

4	Steady state heat transfer analysis	Steady state heat transfer analysis: one dimensional analysis of a fin and two dimensional analysis of thin plate	"Finite Element Analysis" by S.Md. Jalaludeen	17	17.1- 17.11 0
5	Dynamic Analysis	Dynamic Analysis: Formulation of finite element model, element matrices, evaluation of Eigen values and Eigen vectors for a stepped bar and a beam.	"Finite Element Analysis" by S.Md. Jalaludeen	16	16.1- 16.68