

AMAE09 AIRCRAFT STRUCTURES-I

UNIT-1 STATICALLY DETERMINATE STRUCTURES

1.1 Analysis of plane Truss-Method of joints-3 D Truss-Plane frames-Composite beam.

UNIT-2 STATICALLY INDETERMINATE STRUCTURES

2.1 Propped Cantilever- Fixed-Fixed beams

2.2 Clapeyron's Three Moment Equation

2.3 Moment Distribution Method.

UNIT-3 ENERGY METHODS

3.1 Strain Energy due to axial, bending and Torsional loads

3.2 Castigliano's theorems- Maxwell's Reciprocal theorem, Unit load method

3.3 Application to beams, trusses, frames, rings, etc.

UNIT-3 COLUMNS

3.1 Columns with various end conditions- Euler's Column curve

3.2 Rankine's formula- Column with initial curvature

3.3 Eccentric loading- South well plot – Beam column

UNIT-4 FAILURE THEORY

4.1 Maximum Stress theory- Maximum Strain Theory

4.2 Maximum Shear Stress Theory- Distortion Theory

4.3 Maximum Strain energy theory- Application to aircraft Structural problems.

Reference Books:

1. Timoshenko, S., "Strength of Materials", Vol. I and II, Princeton D. Von Nostrand Co, 1990.