

PAE4I103 AIRCRAFT STRUCTURES – I

UNIT 1. STATICALLY DETERMINATE STRUCTURES

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

UNIT 2. STATICALLY INDETERMINATE STRUCTURES

Propped Cantilever- Fixed-Fixed beams-Clapeyron's Three Moment Equation - Moment Distribution Method.

UNIT 3. ENERGY METHODS

Strain Energy due to axial, bending and Torsional loads – Castigliano's theorems- Maxwell's Reciprocal theorem, Unit load method - application to beams, trusses, frames, rings, etc.

UNIT 4. COLUMNS

Columns with various end conditions – Euler's Column curve – Rankine's formula - Column with initial curvature - Eccentric loading – South well plot – Beam column.

UNIT 5. FAILURE THEORY

Maximum Stress theory – Maximum Strain Theory – Maximum Shear Stress Theory – Distortion Theory – Maximum Strain energy theory – Application to aircraft Structural problems.

TEXT BOOK

1. Donaldson, B.K., "Analysis of Aircraft Structures – An Introduction", McGraw-Hill, 1993.
2. Bruhn.E.F."Analysis and design of flight vehicle structures" Tri set of offset company, USA,1973.

REFERENCE

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