PAE5I101 Aircraft Structures – II(3-0-1)

Module – I UNSYMMETRICAL BENDING

Principal axis and neutral axis methods- bending stresses in beams of symmetric sections with skew loads-bending stresses in beams of unsymmetrical sections.

Module – 2. SHEAR FLOW IN OPEN SECTIONS

Thin walled beams, Concept of shear flow, shear centre, Elastic axis. With one axis of

symmetry, with wall effective and ineffective in bending, unsymmetrical beam sections.

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Module – 3. SHEAR FLOW IN CLOSED SECTIONS

Bredt – Batho formula, Single and multi – cell structures.- Shear flow in single & multicell

structures under torsion. Shear flow in single and multicell under bending with walls

effective and ineffective.

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Module – 4. BUCKLING OF PLATES

Vortex Filament, Biot and Savart Law, Bound Vortex and trailing Vortex, Horse Shoe Vortex, Lifting Line Theory and its limitations.

Module –5. STRESS ANALYSIS IN WING AND FUSELAGE

Shear resistant web beams-Tension field web beams(Wagner's) – Shear and bending

moment distribution for cantilever and semi-cantilever types of beams

TEXT BOOKS

1. Peery, D.J., and Azar, J.J., "Aircraft Structures", 2nd edition, McGraw–Hill, N.Y., 2007.

2. Megson, T.M.G., "Aircraft Structures for Engineering Students", Edward Arnold, 2007.

REFERENCES

1. Bruhn. E.H. "Analysis and Design of Flight vehicles Structures", Tri – state off set

company, USA, 1985.

2. Rivello, R.M., "Theory and Analysis of Flight Structures", McGraw-Hill, 1993.