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AE8502 AIRCRAFT STRUCTURES - II L T P C 3 2 0 4

UNIT I UNSYMMETRICAL BENDING 9+6

Bending of symmetric beams subject to skew loads - bending stresses in beams of unsymmetrical sections – generalized k-method, neutral axis method, principal axis method, Advantages and Disadvantages of three methods.

UNIT II SHEAR FLOW IN OPEN SECTIONS 9+6

Thin walled beams – concept of shear flow – the shear centre and its determination – shear flow distribution in symmetrical and unsymmetrical thin-walled sections – structural idealization – shear flow variation in idealized sections-Applications of shear flow calculations.

UNIT III SHEAR FLOW IN CLOSED SECTIONS 9+6

Bredt - Batho theory – single-cell and multi-cell tubes subject to torsion – shear flow distribution in thin-walled single & multi-cell structures subject to combined bending and torsion – with walls effective and ineffective in bending-Importance of shear flow & shear center determination.

UNIT IV BUCKLING OF PLATES 9+6

Bending of thin plates - local buckling stress of thin walled sections – crippling strength estimation thin skin stringer panel-effective skin width –inter rivet buckling-skin stringer panel-Integrally stiffened panels-cutouts- Lightly loaded beams.

UNIT V STRESS ANALYSIS OF WING AND FUSELAGE 9+6

Aircraft loads- classification – the V-n diagram – shear force and bending moment distribution over the aircraft wing and fuselage – shear flow in thin-webbed beams with parallel and non-parallel flanges – complete tension field beams – semi-tension field beam theory.

TEXT BOOKS:

1. Bruhn. E.H., "Analysis and Design of Flight Vehicles Structures", Tri-state off-set Company, USA, 1985.

2. Megson T M G, "Aircraft Structures for Engineering Students", Elsevier Ltd, 2012

3. Michael Chun-Yung Niu, “Airframe structural Design”, Conmilit Press Ltd,1998

REFERENCES:

1. Howard D Curtis, "Fundamentals of Aircraft Structural Analysis", WCB-McGraw Hill, 1997

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

3. Peery, D.J., and Azar, J.J., "Aircraft Structures", 2nd edition, McGraw – Hill, N.Y., 1999