AMAEE14 AIRCRAFT STRUCTURES-II

UNIT-1 UNSYMMETRICAL BENDING
1.1 General, Principal axis and neutral axis methods
1.2 Bending stresses in beams of symmetric sections with skew loads
1.3 Bending stresses in beams of unsymmetrical sections.

UNIT-2 SHEAR FLOW IN OPEN SECTIONS
2.1 Thin walled beams, Concept of shear flow, shear centre, Elastic axis.
2.2 With one axis of symmetry, with wall effective and ineffective in bending,
2.3 Unsymmetrical beam sections.

UNIT-3 SHEAR FLOW IN CLOSED SECTIONS
3.1 Bredt- Batho formula, Single and multi- cell structures.
3.2 Shear flow in single & multicell structures under torsion.
3.3 Shear flow in single and multicell under bending with walls effective and ineffective.

UNIT-4 BUCKLING OF PLATES
4.1 Rectangular sheets under compression, local buckling stress of thin walled section
4.2 Crippling stresses by Needham's and Gerard's methods,
4.3 Thin walled column strength-sheet stiffener panels-Effective width.

UNIT-5 STRESS ANALYSIS IN WING AND FUSELAGE
5.1 Shear resistant web beams-Tension field web beams(Wagner's)
5.2 Shear and bending moment distribution for cantilever and semi-cantilever types of beams
5.3 Loads on aircraft –lift distribution-V-n diagram-Gust loads

References 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.