

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

AERONAUTICAL ENGINEERING

Subject Name: **Aircraft Structure II**

Subject Code: **150103**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Internal Assessment (I)
3	0	2	5	70	30	50

Sr. No	Course Content
1.	Energy Theorems and Their Applications: Casting lieno's theorems, Unit load method, Computation of displacement statically determinate structure and analysis of statically indeterminate structure like beam, Frame and truss, Introduction to 3D elasticity, Saint Venants theory of torsion, Rayleigh methods of structural analysis, Concept and principals of structural analysis and modeling, Development of simplified structural models and their application to air craft components.
2.	Matrix Methods of Structural Analysis: Introduction to stiffness and flexibility method, Application of system approach to analysis of beam, truss and frame.
3.	Airworthiness and Airframe Loads: Factor of safety – Flight envelope, Load factor determination, Aircraft inertia loads.
4.	Unsymmetrical Bending: Unsymmetrical Bending: Introductory, Unsymmetrical bending, Bending stress through product of inertia.
5.	Bending, Shear and Torsion of Open and Closed, Thin-Walled Beams: Shear center, Shear flow, Bending of open and closed section beams, General stress, Strain and displacement relationships for open and single cell closed section thin-walled beams, Shear of open section beams, Shear of closed section beams, Torsion of closed section beams, Torsion of open section beams, Analysis of combined open and closed sections, Structural idealization. Effect of idealization on the analysis of open and closed section beams.
6.	Sterss Analysis of Aircraft Components: Tapered beams, Fuselages, Wings Fuselage frames and wing ribs, Cut –out in wings and fuselages, Laminated composite structures.

Reference Books:

1. Mechanics of Structure Vol. I: S. B. Junarkar.
2. Theory of Elasticity: Tiemo Shenko.
3. Analysis of Structure Vol. I: S. S. Bhavikatti.
4. Aircraft Structures: David J Peery & J J Azar.
5. Introduction to Aerospace Structural analysis: David H Allen & Walter E Haisler.
6. Aircraft structures for Engg. Students: THM Megson, Edward Arnold.
7. Mechanics of Aircraft Structures: C. T. Sun.
8. Strength of Material & theory of structure: B. C. Punmia.
9. Analysis of structures: V N Vazirani & M M Ratwani.