AEROSPACE STRUCTURAL ANALYSIS-I (AE670A)

Instructor: Dr. P. Chakraborty
Office: NWTF 210/F
Phone: 7951
Email: cpritam@iitk.ac.in

Course Content:

- Free Body Diagram; Equilibrium Equations.
- Axial members; Truss.
- Bending moment and Shear Force.
- Theory of Elasticity; Plane stress and strain problems.
- Beam bending; Symmetrical and unsymmetrical sections; Temperature effects; Non-homogeneous materials; Modulus weighted sectional properties; Thin walled sections.
- Torsion of circular and non-circular sections; Thin walled sections; Single and multiple closed cell sections.
- Shear in thin walled sections; Shear center and multiple cell sections; Combined bending and torsion.
- Buckling of columns.

References:

- Theory and Analysis of Flight Structures, R.M. Rivello.
- Aircraft Structures for Engineering Students, THG Megson.
- Analysis of Aircraft Structures, BK Donaldson.
- An Introduction to the Mechanics of Solids, SH Crandall, NC Dahl, TJ Lardner.
- Engineering Mechanics Statics, RC Hibbler.
- Elements of Strength of Materials, SP Timoshenko, DH Young.
- Engineering Mechanics Statics and Dynamics, IH Shames, GKM Rao.

Examinations and Weights:

End Semester (45%), Mid Semester (30%), Average of 4 Quizzes (25%).

Additional Remark:

- The date of a Quiz will be declared in the previous class. It can be taken outside normal class hours. The total mark, number of questions and duration of quiz may vary. No retake of Quiz.
- Quiz syllabus will cover whatever has been covered after the previous Quiz.
- End semester syllabus will include everything from day 1.
- No marks for homework problems. Quiz questions may be based on them.
- Attendance is compulsory and will be monitored. Attendance will have no weight towards final grading. However, it can be used to recommend deregistration from the course.

- Extra lectures may be held as required.
- Relative grading.