AE221 Aug 3:0

Flight Vehicle Structures

Instructor

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Department: Aerospace Engineering

Course Time: Mon., Wed., Fri., 12:00-13:00

Lecture venue: AE105

Detailed Course Page:

Announcements

Brief description of the course

The course aims to impart detailed theoretical problem solving skills related to analysis and design of flight vehicle structures. The course is a core course for MTech degree program in Aerospace Engineering. The course can be credited by research students who are interested in analysis and design of flight vehicle structures.

Prerequisites

The course is intended for aerospace engineering masters degree students with undergraduate level background in structural mechanics. Those students who are not from Aerospace/Mechanical/Civil engineering undergraduate background, should have background in basic engineering mechanics.

Syllabus

Characteristics of aircraft structures and materials, introduction to elasticity, torsion, bending and flexural shear, flexural shear flow in thin-walled sections, elastic bucking, failure theories. Variational principles and energy methods, analysis of composite laminates, loads on aircraft, basic aeroelasticity.

Course outcomes

From this course, the students would learn various theories and principles of analyzing vehicle structural components, method of calculating structural loads due to aerodynamics and various principles by which the structures are designed. The students would develop theoretical problem solving skills and skills to apply such understanding into structural design practices in aerospace industries.

Grading policy

50% for assignments, 50% for final.

Assignments

One assignment in the form problem solving in the class after each module of lecture, in total about 12 lecture modules.

Resources

Sun, C.T., Mechanics of Aircraft Structures, John Wiley and Sons, New York, 2006.

Megson, T.H.G., Aircraft Structures for Engineering Students, Butterworth-Heinemann, Oxford, 1999.

Wallerstein, D.V., Variational Approach to Structural Analysis, John Wiley and Sons, 2001.

Shames, I.H., and Dym, C.L., Energy and Finite Element Methods in Structural Mechanics, Taylor and Francis, 1991.

Srinath, L.S., Advanced Mechanics of Solids, Tata McGraw Hill, 2003