



AIRCRAFT STRUCTURES - I

PROF. ANUP GHOSH

Department of Aerospace Engineering
IIT Kharagpur

TYPE OF COURSE : New | Core | UG/PG

COURSE DURATION : 8 weeks (20 Jul' 20 - 11 Sep' 20)

EXAM DATE : 27 Sep 2020

PRE-REQUISITES : Basic Solid Mechanics

INTENDED AUDIENCE : Aerospace, Mechanical, Civil, Naval Architecture

INDUSTRIES APPLICABLE TO : ISRO, DRDO, CYIENT, TATA Lockheed Martin Aerostructures Ltd.,
Mahindra Aerospace, HAL, Raj Hamsa Ultralights

COURSE OUTLINE :

This course is an introduction for the analysis of aircraft structures. It bridges together the basic solid mechanics with applications to aerospace structures. The course starts with the introduction to the basic details of type of structures used in aircraft construction. It is followed by an introduction to the estimation of loads on wing, fuselage and landing gear. Principle of stressed skin structure and indeterminate structures are covered next. Theory of elasticity will be introduced later for analysis of problems related to aerospace structures.

ABOUT INSTRUCTOR :

Prof. Anup Ghosh have guided three Ph. D. student and 3 more students are continuing at present. In this process we have explored and studied the nonlinear behaviour of laminated composite laminates in association with the interdigitated smart composite structures. The study also include the hygrothermal effect on the geometrically nonlinear vibration of AFC actuated composite structures. It includes the active vibration control of smart laminated composite plates. An UAV laboratory has been developed in the recent years in our department. This laboratory is equipped with all possible mode of UAV fabrication facility including fibre reinforced laminated composite structures using vacuum assisted resin transfer moulding procedure. Five major sponsored R&D projects have been completed/handled. In a nut shell any research related to the structural analysis and experiments of aircraft related structures may be pursued.

COURSE PLAN :

Week 1: Introduction to Flight Vehicle Structures

Week 2: Forces Acting On An Aircraft

Week 3: Statically Determinate and Indeterminate Structures

Week 4: Landing Gear

Week 5: Energy Methods of Structural Analysis – I

Week 6: Energy Methods of Structural Analysis – II

Week 7: Theory of Elasticity – I

Week 8: Theory of Elasticity – II