

Aircraft Structures

(Specific module for Aerospace Engineering students)

Location : ISAE-SUPAERO

Objectives : To provide a broad knowledge of the aeronautical structures: design, analysis and tests, maintenance
To provide the methods for the static analysis of different parts of an aircraft (wings, fuselage, ...)
To illustrate the relationship between the calculation methods and the physical phenomena (buckling of a spar, loads in a landing gear),

Prerequisites : Elasticity, strength of materials, long beams, plates and bodies

Contents : Lectures :

- Design : materials, manufacturing methods, assemblies, sections breakdown, quality control, structure protection
- Analysis and tests: FEM, loads, static analysis, fatigue & damage tolerance, other analyses, structure testing, particular risks analysis, failure cases
- Maintenance, MPD, AMM, SRM, inspection methods, Service Bulletins
- Static analysis : strength analysis methods, bending moment, torsion moment, shear force, pressurization, tension and compression, shear stress, stability, analysis of a wing box

Labs :

- buckling of a spar, loads in a landing gear, manufacturing of composite materials plates

Duration : 14 sessions of 60' each

Professor : Marc ROLIN
Jean-Fred BEGUE

Bibliography : E.F. Brunh, Analysis and design of flight vehicles structures, Tri-state offset company, 1973

Evaluation : Written exam (midterm quiz)