Composite structures and case study

Level
BAC +4

ECTS
3 credits

Component
INSTITUT NATIONAL DES SCIENCES APPLIQUEES TOULOUSE

Number of hours
46h

Presentation

Description

A general course (16.25 h) to the whole group is given on laminate theory and technos. A handout deals with simple and more complex issues of composite theories. A general presentation deals on technos.

Organization:

* A project on an aeronautic case study is done within 6 courses of 3h each and deals with basic static sizing, damage tolerance design and manufacturing.
* The project is done by pair under the supervision of academic or senior engineer.
* 6h of CATIA Composite are also done to study practical composite design rules of aeronautic industry.
* Two practical works of 3h each enables to manufacture composite plates by hand stacking or LRI.

Objectives

Main Objectives :

The student will be able to perform simple sizing of composite structures and to choice a couple manufacturing/material for a given case study.

The student will be able to:

* Choice a couple of fibers and matrix and their commercial products.
* Choice a type of composite structure: laminates, sandwichs, 2D1/2,3D, 4D.
* Determine the manufacturing method: hand layup, fiber placement, RTM, LRI, RFI.
* To be inspired by solutions of automotive, naval, wind energy or aerospace industry.
* To be inspired by past experience in aeronautic industry.
* Know and use laminate theory.
* Knows and use simple sizing of junctions.
* Know issues of impact and ageing.
* Know issues of failure and damage.
* Realize a case study : example wing box of an acrobatic aircraft.
* Make a presentation of their sizing and their design.
* Work in a collaborative manner.

Pre-requisites

- Beam theory, Continuum mechanics, Materials behaviors.

- Matrix calculation.

Useful info

Place

Toulouse