
EN2910 Aircraft Design

Professor : Didier BREYNE

Language of instruction : ANGLAIS – **Number of hours :** 36 – **ECTS :** 3,0 - **Quota :** 22

Prerequisites :

Period : S7 elective 6 in january
S8 elective 13 in may

Course Objectives

The goal of this training is to describe the different stages of the design process of an aircraft, in both a theoretical and a practical perspective. You will be introduced to the typical methods used in the research department of a company, and apply this knowledge by doing the conceptual design of your own aircraft. After completing this training course, you will have acquired the knowledge and skills that will enable you to define the main characteristics of an aircraft in a very short time frame.

Course Contents

The aircraft design process always follows the same pattern. The process starts by making the reverse engineering of existing products. Next is the conceptual design which is followed by the preliminary design and detail design. All the time, a large number of iterations are made before proceeding to the next stage. In the process, we will start with a global or synthetic approach of aircraft design before getting into more and more detail. We will go from a basic concept into full optimization, from using parameters derived from simple statistical data to using high sophisticated algorithms.

The student will learn how to:

- Define the main characteristics of the new aircraft
- Work out estimates for empty weight and maximum take-off weight
- Compute wing loading
- Compute aerodynamic quality of the aircraft
- Compute the performance (take-off, climb, cruise, landing)
- Make an analysis of the aircraft's stability and control
- Compute the applied loads
- Select the structural materials
- Estimate the costs (design, manufacturing, operational)

Of course, the general concepts are not only valid for aircraft design, but can equally be applied to the development of any product.

Course Organization

This course may be taken over a week in January as part of the S7 or over a week in May as part of the S8.

Evaluation

Evaluation will include:

- One-hour written test, without document, which will take place the last day of the course
- A final oral presentation in front of the classroom