EN2910
Aircraft Design

Professor: Didier Breyne

Language of instruction: English – **Number of hours**: 36 – **ECTS**: 3

Prerequisites: None

Period:	S7	Elective 06	January	IN27DE6, FEP7DE6
	S8	Elective 13, One-week module 2	16-20 May	IN28IS2, SEP8IS2

Course Objectives

The goal of this training is to let you discover the different stages of an aircraft design process in both a theoretical and a practical perspective. You will be introduced to the typical methods used in an aircraft design office, and apply this knowledge by doing the preliminary design of your own aircraft After completing this training course, you will have acquired knowledge and skills that will enable you to work out the main aircraft characteristics and layout in a very short time frame.

Course Contents

When a team commits to design a new aircraft or to modify an existing aircraft, the project will always follow the same pattern. The process starts by analyzing the market and existing products. Next is the conceptual design which is followed by the preliminary design and detail design before sending the drawings to the workshop which will build a prototype. Obviously, at each stage, several iterations are made as necessary before proceeding to the next stage.

In the process, we will begin by a more 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 sophisticated algorithms.

You will learn how to:

- Define the layout and configuration of the new aircraft
- Work out estimates for empty weight and maximum take-off weight
- Compute wing loading
- Work out estimates for lift and drag
- Work out performance estimates (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 other conceivable product or service.

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 report about the aircraft design project, to be sent 1 week after the end of the course, at the latest.