

Hochschule für Angewandte Wissenschaften Hamburg Hamburg University of Applied Sciences

## DEPARTMENT OF AUTOMOTIVE AND AERONAUTICAL ENGINEERING

## **Integration of Aircraft Design Methods into a Preliminary Sizing Tool**

Project work towards a thesis at ETSIA UPM

## Background

The Aircraft <u>Pre</u>liminary <u>Sizing Tool</u> – PreSTo is a spreadsheet in MS Excel and VBA based on the Aircraft Design lecture of Prof. Scholz. The tool allows the user to carry out a simple but meaningful preliminary sizing of jet and propeller aircraft. The user is guided step by step through the sizing process and is asked to input aircraft requirements. Design decisions are supported by incorporated statistics and proposals of design parameters. The design is checked for consistency and conformity to certification rules. Interfaces to high level design tools offer a continuous work flow.

## Task

The tasks of the project consists of integration, completion, verification / validation and first application of PreSTo from preliminary sizing to design evaluation with Direct Operating Costs (DOC). In detail, the thesis should follow these steps:

- <u>Short</u> description of PreSTo: philosophy, principles and capabilities
- Integration, completion, verification / validation of all modules. Special attention has to be given to the modules
  - Fuselage / Cabin
  - Landing Gear
    - Including a detailed study of the aircraft's attitude during take-off and landing in order to determine tail clearance
- Application of PreSTo: Preliminary sizing and preliminary redesign of the Fairchild Dornier 728.

The report has to be written in English based on German or international standards on report writing.