



**DEPARTMENT FAHRZEUGTECHNIK UND FLUGZEUGBAU**

# **Aircraft Design Studies Based on the ATR 72**

Project work towards a thesis at Universitatea Politehnica din Bucuresti (PUB)

## **Background**

Aircraft design studies at universities seem to concentrate quite often at civil transport jets. In this respect, Hamburg University of Applied Sciences is no exception. In order to cover a little bit of new ground in aircraft design teaching, it was decided to pay more attention to propeller driven aircraft, starting with passenger aircraft (certified based on CS-25) and subsequently considering the whole field of propeller aircraft certified based on CS-23, CS-VLA and to ultra light aircraft. Emphasis should be given to the respective methods for preliminary sizing of the respective category of aircraft. Furthermore, effects that have to be handled differently from jets should be considered carefully and in depth.

## **Task**

An ATR 72 should be redesigned. If time allows, preliminary sizing according to CS-VLA should be considered. ATR 72 redesign should comprise of:

- Parameter studies: power, propeller efficiency and glide ratio as a function of operational and geometric parameters.
- Data collection and evaluation for the ATR 72.
- Preliminary sizing of turboprop aircraft for CS-25 – general approach and application to ATR 72.
- Sizing of cabin / fuselage, wing (including high lift devices) empennage and landing gear.
- Calculation of mass, drag polar and DOC.

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