Aero - Aircraft Design and Systems Group
Forschungsgruppe Flugzeugentwurf und Systeme

Head: Prof. Dr.-Ing. Dieter Scholz, MSME
Hamburg University of Applied Sciences, Berliner Tor 9, 20099 Hamburg, Germany

Aero
- Conducting funded projects in research, development and teaching (short courses)
- Guiding research assistants to cooperative dissertations
- Incorporating students with project or thesis work
- Contributing to the research focal point "Aeronautical Engineering" at Hamburg University of Applied Science

FLECS
Functional Library of the Environmental Control System
Simulation and configuration of aircraft air conditioning system
Funding: LuFo-Hamburg

GF
Green Freighter
Aircraft design for environment-friendly and cost-effective cargo aircraft with unconventional configuration
Funding: Federal Ministry of Education and Research

ALOHA
Aircraft Design for Low Cost Ground Handling
Development of aircrafts for low budget flying
Funding: Federal Ministry of Education and Research

EPM A
European Postgraduate Master in Aeronautical Engineering
Development of a joint master programme with European partner universities
Funding: EU - ERASMUS

http://Aero.ProfScholz.de
FLECS
Functional Library of the Environmental Control System

Christian Müller, Dieter Scholz
Hamburg University of Applied Sciences, Berliner Tor 9, 20099 Hamburg, Germany

General
- Support of design activities:
  - innovative air conditioning systems
  - optimum system configurations
- Model library based on MATLAB/Simulink
- Library with simulation models of all relevant components from:
  - air conditioning system
  - aircraft cabin

Methods
- Combined simulation of heat and mass flow systems
- Simulation of network topologies
- Conduction, convection and radiation
- Condensation and evaporation
- Graphical User Interfaces for industrial use
- Production for real time capable code

Achievements
- Functional simulation of entire aircraft air conditioning system and cabin
- Simulation of temperature variations with respect to ECS requirements
- Investigation of different temperature control strategies

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Cabin

Trim Air Valve

Mixing Unit

Pack

Fan

Engine

bleed air: \( p_{cab} + 275 \text{ hPa}; 180^\circ \text{C} \)
General
- Research and comparison of conventional and unconventional cargo aircraft, e.g. Blended Wing Body (BWB) or flying wing configurations
- Tentative entry-into-service: 2025
- Main focus on environment-friendly and cost-effective aircraft operation

Targets
- Low fuel consumption
- Future fuels (liquid hydrogen, synthetic fuels, bio-fuel)
- Low noise (night time operation)
- Low emissions (carbon dioxide, nitrogen oxides, ...)
- Low operating costs (zero-pilot operation, reduced aircraft systems)

Methods and Tools
- Aircraft preliminary sizing with HAW spreadsheets
- In-depth design, analysis and optimisation with IFL's PrADO (Preliminary Aircraft Design and Optimisation program)

Finances
- HAW involvement funded by the FH3-program of the Federal Ministry of Education and Research
- IFL involvement funded by Airbus Deutschland

GF - Green Freighter
Aircraft Design for Environment-Friendly and Cost-Effective Cargo Aircraft with Unconventional Configuration
Kolja Seeckt, Dieter Scholz
Hamburg University of Applied Sciences, Berliner Tor 9, 20099 Hamburg, Germany

http://GF.ProfScholz.de
European Postgraduate Master in Aeronautical Engineering

**Modules** *

* Introduction to Aeronautical Engineering

**Oostende:**
- Avionic Systems Engineering and Flight Control **
- Air Transport Economics **
- Spacionic Systems Design
- Noise and Vibration Engineering
- Unmanned Aeronautical Systems

**Bordeaux:**
- Aircraft Maintenance Management **
- Composite Materials and Maintenance **
- Aircraft Propulsion and Maintenance
- Reliability and Integrated Logistic Support
- Finite Element Dimensioning for Composite Materials

**Hamburg:**
- Aircraft Design **
- Design of Lightweight Aircraft Structures **
- High Performance Fibre Reinforced Composite Materials
- Aircraft Systems Technology
- Aircraft Systems Integration

**Other Location:**
- CFD for Aircraft Aerodynamics

* to be confirmed
** mandatory module

★★ Part time study programme
★★ Joint European master programme
★★ Awards joint/double master degree
★★ Funded by European Commission

**Target group:** Graduates
- with aeronautical engineering degree
- minimum of 4 years of academic training (or equivalent credits) and some years of relevant industry experience

**Study programme:**
- 60 ECTS (equivalent to 1 year full time study)
- 10 short courses:
  - duration one week each
  - preparation and homework required
- master thesis
- combined in teaching:
  - academia's and industry's expertise

**Partners in the programme:**
- Hochschule für Angewandte Wissenschaften Hamburg
- Katholieke Hogeschool Brugge - Oostende
- Université Bordeaux 1

http://www.EPMA.aero