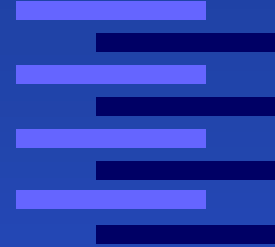




Luftfahrtstandort  
Hamburg

Hamburg – The place for aviation



Hochschule für Angewandte Wissenschaften Hamburg

*Hamburg University of Applied Sciences*

DEPARTMENT OF AUTOMOTIVE AND AERONAUTICAL ENGINEERING



## Presentation of HAW Hamburg

on the occasion of the

**EWADE Meeting 2006**

6th September 2006

Prof. Dr.-Ing. Dieter Scholz, MSME

■ university



HAW Hamburg

## Hamburg University of Applied Sciences (HAW Hamburg)

5 faculties

12000 students

At campus Berliner Tor:

### Faculty of Engineering and Computer Science

- Electrical Engineering
- Mechanical Engineering
- Computer Science
- **Automotive and Aeronautical Engineering**

with together 4200 students



■ university



HAW Hamburg







■ university



HAW Hamburg



■ university



HAW Hamburg



## Hamburg University of Applied Sciences

### The other faculties:

- Design, Media and Information
- Life Science
- Business & Public Management
- Social Work & Nursing

## Department of Automotive and Aeronautical Engineering

- **1200 students**
  - 800 students in automotive engineering
  - 400 students in aeronautical engineering
  - about **120 graduates** per year  
(80 automotive, **40 aeronautical engineers**)

**these are less students than industry needs**
  
- 43 professors
- about 20 lecturers from industry
- 20 other members of staff





- degree programmes

Degree programme **aeronautical engineering** with **study majors:**

- **Design and lightweight structures**
- **Cabin and cabin systems**

Among German UAS:

Propulsion → Aachen

Space science → Aachen

Aircraft operation → München



## ■ degree programmes



semester	sections
	first internship (13 weeks)
1	foundation studies
2	
3	
4	main studies
5	
6	
7	second internship (20 weeks) with bachelor thesis
8	master studies
9	
10	master thesis

duration of studies → 7 semesters: bachelor degree  
→ 10 semesters: master degree

## ■ foundation studies



▪ Mathematics, Computer Science	16 CP
▪ Mechanics	22 CP
▪ Thermodynamics, Fluid Mechanics Electrical Engineering, Physics	17 CP
▪ Design with CAD, Descriptive Geometry, Material Science, Machine Parts	35 CP
<hr/>	
Total:	90 CP

CAD teaching starts already in semester 1 (CATIA V5)



## Study Major: Design and Lightweight Structures

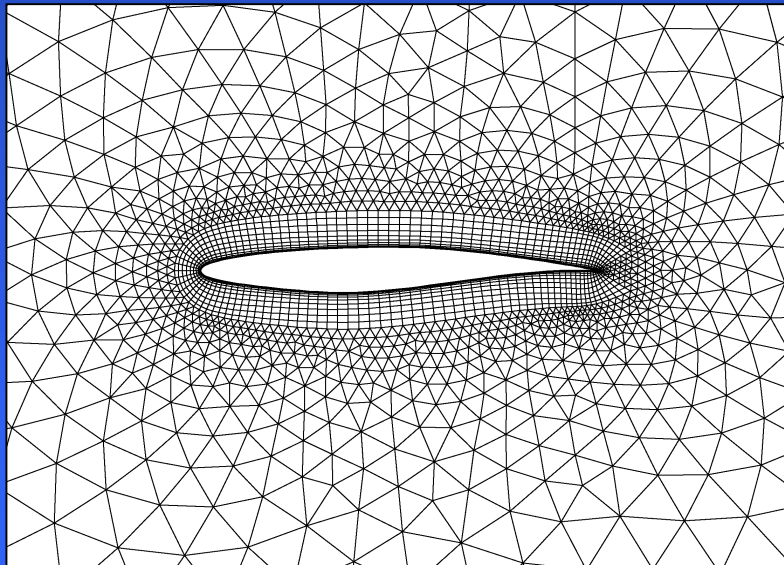
■ <b>Design</b>	<b>28 CP</b>
Aerodynamics with lab work, Flight Mechanics with lab work, Aircraft Propulsion, Aircraft Systems	
■ <b>Lightweight Structures</b>	<b>48 CP</b>
Structure Design, Structure Analysis, Aircraft Manufacturing, Lightweight Structures Lab, Project, Field Trip	
■ <b>General Sciences</b>	<b>14 CP</b>
Introduction to Business, Human Resource Management, Seminar, Planning & Presentation, Value Engineering	
<b>Total</b>	<b>90 CP</b>

■ main studies



## Aerodynamics

Flow analysis with CFD  
(DLR-TAU)



In the wind tunnel

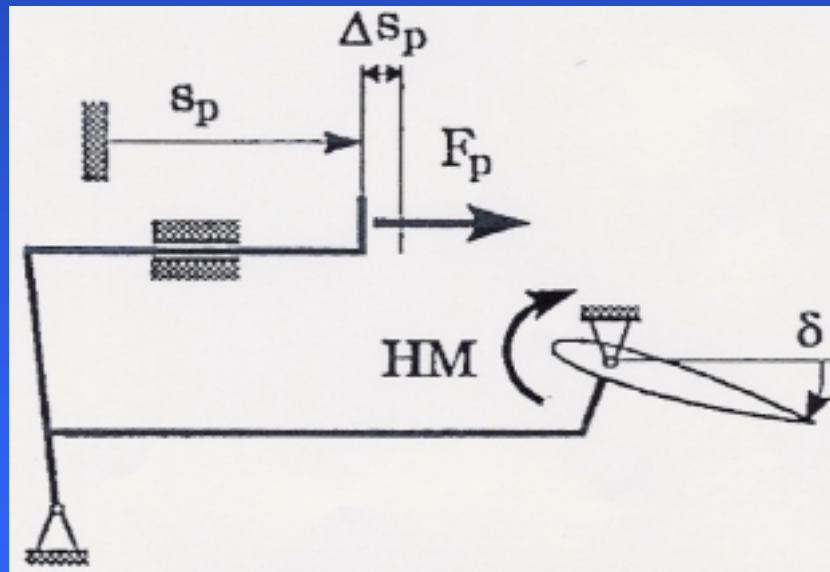


- main studies



## Flight Mechanics

Measuring stick forces during flight testing

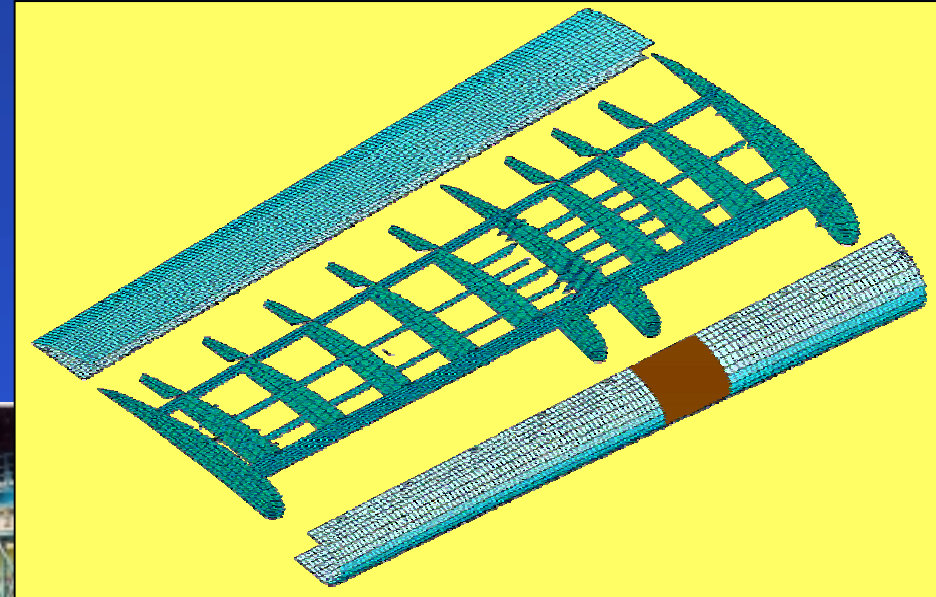




■ main studies

## Aircraft Structures

Finite Element Modell  
of the Do 728 flap  
(NASTRAN-PATRAN)



Fatigue testing:  
Airbus A340-600



## Study Major: Cabin and Cabin Systems

▪ <b>Fundamentals of Aeronautical Engineering</b>	<b>21 CP</b>
Aerodynamics / Flight Mechanics / Aircraft Design, Structure Analysis, Cabin Architectures	
▪ <b>Cabin and Cabin Systems</b>	<b>55 CP</b>
Cabin Modules & Monuments, Composite Materials and Sandwich Technology, Lightweight Structures Lab, Ergonomics and Design, Manufacturing, Cabin Systems, Aircraft System Design, Aircraft System Integration, Project, Field Trip	
▪ <b>General Sciences</b>	<b>14 CP</b>
Introduction to Business, Human Resource Management, Seminar, Planning & Presentation, Value Engineering	
<b>Total</b>	<b>90 CP</b>

- main studies



## Aircraft Cabin and Cabin Systems



Cabin Modules



Cabin Architectures



Ergonomics and Design



Communication and Entertainment



## Master Programme

▪ <b>Aeronautical Engineering</b>	<b>18 CP</b>
Vibration Analysis, Computational Fluid Dynamics, Optimization, Aircraft Systems	
▪ <b>Design and Lightweight Structures</b>	<b>30 CP</b>
or	
▪ <b>Cabin and Cabin Systems</b>	
▪ <b>Business and Management</b>	<b>12 CP</b>
<b>Summe</b>	<b>60 CP</b>





■ teaching concepts

**Teaching success achieved through ...**

- teaching small groups (up to 40 students)
- application of software that is also used in industry
- lectures that are supported by lab work
- field trips
- project work in teams
- students being ask to solve their tasks independently (with a minimum of guidance)
- students being ask to produce their bachelor and master thesis as independent scientific work

■ student groups

## Learning how to work in a team through ...

- administrative and political university groups
- exhibition team
- "Mobiles" team ("Mobiles" is a journal of the department with students forming the editorial board)
- Blended-Wing-Body team





- close to industry

## Studies at HAW Hamburg: **practice oriented**

- 13 weeks: first internship
  - 20 weeks: second internship with bachelor thesis
  - master thesis often done in industry
- => the students are in industry about 25% of the time**

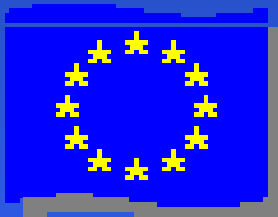
### **Our main partners in industry:**

- AIRBUS Deutschland, Hamburg
- Lufthansa Technik AG, Hamburg
- HECAS, Hamburg
- Hanse Aerospace, Hamburg
- EADS, München
- MTU, München
- RollsRoyce, Berlin

## ■ international

### International education:

- internship abroad (LEONARDO)
- study abroad (SOCRATES)
- master Thesis in industry abroad
- international degrees: BEng, MEng



### Partner universities

- ESTACA, Paris
- University of Hertfordshire
- University of Limerick
- Université Bordeaux 1
- Helsinki Polytechnic
- UTBV (Brasov, Romania)
- PUB (Bucharest, Romania)
- KHBO (Ostende, Belgium)



## Teaming up for a European Master Programme:

### **European Postgraduate Master in Aeronautical Engineering (EPMA)**

A professional Master Programme based on 10 short courses and a thesis. Funded by ERASMUS.

Main Partners:

- HAW Hamburg, KHBO, U Bordeaux

Associated Partners:

- TUHH, UH, UTBV

**Short courses** offered in parallel to industry.

(Based on experience from the MEng in Lightweight Structures)



- integrated studies in aeronautics



Another way to study:

## Integrated Studies in Aeronautical Engineering

Sandwich course:

- Studies at HAW Hamburg
- Work placement (during semester breaks)
- Additional training in industrie
- An additional 20-week-internship.

In Cooperation with:

- **Lufthansa Technik AG**, Hamburg
- **AIRBUS**, Hamburg

## Aviation is booming!

### Potential employers for HAW Hamburg graduates:

Airbus Deutschland

Lufthansa Technik

EADS: Eurofighter, Eurocopter, Astrium

MTU

RollsRoyce Aero Engines

DLR, IABG

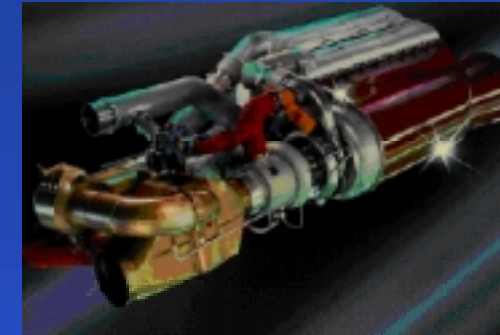
Bundesamt für Wehrtechnik und Beschaffung

Luftfahrtbundesamt

Suppliers

Engineering offices

University research focal point:  
**Aeronautical Engineering**



- Prof. Dr. Seibel:
  - Validation of structural analysis models
  - Structures designed and manufactured with fibre-reinforced materials
- Prof. Dr. Schumacher:
  - Optimum design of lightweight structures
  - Crash simulation
- Prof. Dr. Scholz:
  - Functional Library of the Environment Control System, FLECS
  - Innovative Aircraft Design: Green Freighter