Presentation of HAW Hamburg

on the occasion of the

EWADE Meeting 2006

6th September 2006

Prof. Dr.-Ing. Dieter Scholz, MSME
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
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 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

<table>
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<tr>
<th>Semester</th>
<th>Sections</th>
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<tr>
<td>1</td>
<td>First internship (13 weeks)</td>
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<td>6</td>
<td>Second internship (20 weeks) with bachelor thesis</td>
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<td>7</td>
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<tr>
<td>8</td>
<td>Master studies</td>
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<td>9</td>
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<tr>
<td>10</td>
<td>Master thesis</td>
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</tbody>
</table>

### Duration of Studies
- 7 semesters: Bachelor degree
- 10 semesters: Master degree
### foundation studies

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>Mathematics, Computer Science</td>
<td>16 CP</td>
</tr>
<tr>
<td>Mechanics</td>
<td>22 CP</td>
</tr>
<tr>
<td>Thermodynamics, Fluid Mechanics</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering, Physics</td>
<td>17 CP</td>
</tr>
<tr>
<td>Design with CAD, Descriptive Geometry, Material Science, Machine Parts</td>
<td>35 CP</td>
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<tr>
<td><strong>Total:</strong></td>
<td><strong>90 CP</strong></td>
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CAD teaching starts already in semester 1 (CATIA V5)
Study Major: Design and Lightweight Structures

- **Design** 28 CP
  Aerodynamics with lab work, Flight Mechanics with lab work, Aircraft Propulsion, Aircraft Systems

- **Lightweight Structures** 48 CP
  Structure Design, Structure Analysis, Aircraft Manufacturing, Lightweight Structures Lab, Project, Field Trip

- **General Sciences** 14 CP
  Introduction to Business, Human Resource Management, Seminar, Planning & Presentation, Value Engineering

**Total** 90 CP
main studies

Aerodynamics

Flow analysis with CFD (DLR-TAU)

In the wind tunnel
Flight Mechanics

Measuring stick forces during flight testing
Aircraft Structures

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

Fatigue testing: Airbus A340-600
## Study Major: Cabin and Cabin Systems

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Fundamentals of Aeronautical Engineering</strong></td>
<td></td>
</tr>
<tr>
<td>Aerodynamics / Flight Mechanics / Aircraft Design, Structure Analysis, Cabin Architectures</td>
<td>21 CP</td>
</tr>
<tr>
<td><strong>Cabin and Cabin Systems</strong></td>
<td></td>
</tr>
<tr>
<td><strong>General Sciences</strong></td>
<td></td>
</tr>
<tr>
<td>Introduction to Business, Human Resource Management, Seminar, Planning &amp; Presentation, Value Engineering</td>
<td>14 CP</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90 CP</td>
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</tbody>
</table>
main studies

Aircraft Cabin and Cabin Systems

Cabin Modules

Ergonomics and Design

Cabin Architectures

Communication and Entertainment
Master Programme

- **Aeronautical Engineering** 18 CP
  Vibration Analysis, Computational Fluid Dynamics, Optimization, Aircraft Systems
- **Design and Lightweight Structures** 30 CP
  or
- **Cabin and Cabin Systems**
- **Business and Management** 12 CP

**Summe** 60 CP
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 asked to solve their tasks independently (with a minimum of guidance)
- students being asked 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
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 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)
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