

# MEAM

## Master of Engineering in Aeronautical Management

Full-time

Degree: Master of Engineering (M.Eng.) in Aeronautical Management



### → Ideas and Goals of the Programme

With aviation developing at accelerated speed it becomes increasingly interesting for pilots, maintenance and technical personell of the aviation systems. The applicants have to be graduates of Bachelor study programs in aviation systems. The Master programme is designed to enhance their competence by the following modules

- Air Transport Business Administration
- Risk Management in Airline Operation
- International Law and Airlaw
- Simulation of Logistic Aviation Systems
- Modelling and Simulation
- Management Systems
- Human Factors in Leadership

The Master programme will prepare the candidates for positions in leadership within airline industry, air transport and governmental institutions.

The instructors staff will be composed of university professors and lecturers with practical airline business experience. Emphasis is laid on an interdisciplinary approach in teaching and learning, group work, and seminars.

The programme is offered in English, entirely.

### → Key Features of the Programme

- Post-graduate education
- Studies in aviation systems engineering, economy and management
- One year full-time
- International lecturers and students
- Guest lecturers and excursions
- Practical training by industrial case studies
- Hochschule Bremen orientation course offered ahead the lecture start
- Tutorial support and guidance

Throughout the academic year, international students can choose from a variety of German language courses. In addition, Hochschule Bremen offers a variety of international Summer Courses for those, who would like to acquire a basic knowledge of the German language before the beginning of the programme.

Please see: <http://www.hs-bremen.de/ifk/>

### → Duration and Organisation

The programme is a two semester, full-time Master degree programme. The programme begins in early October and ends in September the following year.

The Master thesis shall be intentionally prepared in the aviation industry.

## → Target group

The programme provides up to 15 places for applicants. Applications are welcome from world-wide. The programme is especially open for pilots/engineers with an academic degree in aviation systems engineering and management, or with an acceptable degree in related areas like aircraft engineering, maintenance, or air traffic administration plus a practical experience.

## → Prospects

The programme is offered to obtain competences for careers in international aviation industry.

## → Structure of the Programme

Due to the demanding time frame high academic standards and a very diligent work schedule are required. Great importance will be attached to improve the students in analytical skills. In both semesters, research skills and methods will support the ability of the students to tackle a problem in a scientific way and to master the art of researching, writing and presenting research papers.

The first semester provides students with an interdisciplinary approach to key factors of aviation management. It will consist of 5 modules, which will be divided into lectures and seminars. Lectures provide essentials of „International Law and Airlaw“, „Air Transport Business Administration“, „Management Systems“, „Risk Management in Airline Operation“, and „Simulation of Logistic Aviation Systems“.

The second semester includes the modules „Human Factors in Leadership“, and „Modelling and Simulation“. Additionally the second semester includes the preparation of the Master thesis. In the Master thesis, candidates are expected to use their theoretical understanding to deal with an appropriate interdisciplinary topic. Three modules of the second semester are foreseen for the preparation of the Master thesis. Candidates may propose a theme or project of their own choice.

## → Partners Abroad

Hochschule Bremen cooperates with several universities world-wide:

- Universidad Tecnica Federico Santa Maria (UTFSM), Valparaiso, Chile
- Academia Ciencias Aeronauticas (ACA), Santiago, Chile
- Arizona State University (ASU), Mesa, Arizona, USA
- Embry Riddle Aeronautical University, USA

## → Degree

After successful completion of the courses and the thesis, students will be awarded the internationally recognised academic degree Master of Engineering (M.Eng.) in Aeronautical Management.

## → Fees and cost

**Fee: EURO 8500**

Fees include tuition fees for all lectures and seminars, registration, examination and graduation fees, contribution to the Student Union, course materials (student manuals and handouts).

The international students can profit from services offered by the International Student Association ISA, a private service company working with Hochschule Bremen, providing tutorial support, help with visa applications, regular social and cultural activities and gatherings, a pick-up service from the airport or train station plus an accommodation arrangement service. This service has to be paid additionally, but for students from abroad this offer of ISA is highly recommended.

**The fees do not include living expenses and health insurance. Regulation for payment:**

- a) A non-refundable fee of EURO 500 at acceptance of the applied enrolment. (within three weeks after notification by Hochschule Bremen).
- b) EURO 4.000 at the beginning of first semester
- c) EURO 4.000 at the beginning of second semester.

## → Financial Aid

not available

## → Application Procedure

The Master programme addresses candidates graduated by an eight semester Bachelor Degree due to the following items:

- 1) Graduates of the International Degree Course in Aviation Systems Engineering and Management (ILST).
- 2) Pilots with a related degree and practical experience.
- 3) Graduates with an acceptable degree in related areas like aircraft engineering, maintenance, or air traffic administration plus a practical experience.

Fluency in English is required. Students whose native language is not English must demonstrate English proficiency with the TOEFL exam (minimum of 220 points computer-based or 560 paper-based) or an equivalent test like the IELTS (at least 6,0).

The complete application documents must be submitted not later than July 15th. Applications must consist of: a registration form (see below), a Curriculum Vitae, a photograph, proof of his or her university degree, the address and telephone number (e-mail address, if available) to which all correspondence should be sent.

## → Information

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**→ Contents of the Master course**

<b>1st Semester</b>				
	Module	Abbreviation	SWS	ECTS Points
1	International Law / Airlaw ILAL 4 6	ILAL	4	6
2	Air Transport Business Administration	ATBA	4	6
3	Management Systems	MANS	4	6
4	Risk Management in Airline Operation	RMAO	4	6
5	Simulation of Logistic Aviation Systems	SLAS	4	6
			20	30

<b>2nd Semester</b>				
	Module	Abbreviation	SWS	ECTS Points
1	Human Factors in Leadership	HFL	4	6
2	Modelling and Simulation	MAS	4	6
3	Master thesis	MTP	12	18
			20	30

## → International Law / Airlaw (ILAL)

### ■ Course aims

Interpretation and application of national, supranational and international Law (basics and methods), preferably with regards to aviation and airlaw.

### ■ Course contents

Legal basis of states and limitation of their sovereignty (main features). International public and private law - basics, interpretation and application. Collision of international, supranational and national rules.

International and supranational Organizations (i. e. ICAO, ECAC, JAA, EU, EASA, EUROCONTROL) – tasks, practice and application of rules (JAR OPS, JAR FCL). International Business Law, Cooperate Law, European Law, European Business Law, European E-Commerce Law.

Political backgrounds, origin, alteration, interpretation and application of supra- and international law with regards to actual developments in international aviation business and air traffic. Cases and elaboration of solutions and the means of compliance.

### ■ Literature

P. Malanczuk, Akehurt's Modern Introduction to International Law, 8. Aufl. 2001

### ■ Prerequisites

Basic knowledge of material with respect to national and international airlaw.

### ■ Proof of academic achievement

1 written examination

### ■ Didactic approach

Lectures  
Group work  
Analyses

## → Air Transport Business Administration (ATBA)

### ■ Course aims

Based on the basic knowledge of business studies due to ILST aims, the student shall be able to reach working competence in transport business. In daily work, airline pilots have decisions to make in which knowledge of transport business is a necessity and that may influence the economic performance of an airline. In addition, pilots are keeping positions in the middle and higher management in every airline.

### ■ Course contents

#### • Economy compass: global air transport business and markets

- accountance administrative
- currencies

#### • International logistic

- resourcing and production planning
- basics of statutes
- accounting balance
- analysis of balance
- cost calculation, management and planning
- controlling and controlling concepts
- management accounting and controlling
- operational microeconomics in airlines and air transport

#### • Practical training to prepare economical decisions

### ■ Didactic approach

Lectures  
Case studies (derived from company experience)  
Group work

### Literature

Stephen Holloway: Straight and Level: Practical Airline Economics. Aldershot (Ashgate 2005<sup>2</sup>)

### Proof of academic achievement

Written examinations and oral examinations

## → Human Factors in Leadership (HFL)

### ■ Course aims

**To impart** knowledge and methods in order to enable independent orientation in dynamic systems with variable regulations;

**to analyze** social and anthropo-technical processes;

**to develop** interdisciplinary problem solving strategies and their adaptation in the field of engineering and aeronautical management.

### ■ Course contents

**The analysis** of interface problems in aviation;

**the research** into psychologically relevant questions concerning the complex of networks in aviation;

**the understanding** of the relevance of areas from applied psychology and their transference to the interfaces of human, machine, environment and organizations;

**the evaluation** and application of psychological research to the questions raised by the all-encompassing systems of aviation.

### ■ Didactic approach

Lectures

Group work

Case studies (correlated with the module RMAN).

Proofs of academic achievement

1 written or oral examination

## → Management Systems (MANS)

### ■ Course aims

Teaching the knowledge which qualifies the students to operate in a leading position under consideration of the actual challenge of the market.

### ■ Course contents

- Understand Industrial management systems
- Create and optimized business processes
- Setup a project organization
- Establish an effective work organization and develop realistic work plans
- Define targets specifically
- Master complex tasks and interfaces
- Control and monitor due dates, cost and quality effectively
- Identify and minimize risks and realize opportunities

### ■ Didactic approach

Lectures

Case studies

### ■ Proofs of academic achievement

Syndicate homework

and presentation of results



## Risk Management in Airline Operation (RMAO)

### ■ Course aims

Teaching the knowledge to identify and assess risk areas in aviation and to develop corresponding prevention strategies. Preparing safety recommendations for an airline management.

### ■ Course contents

#### 1. General Principles of Risk Management

Risk assessment, prevention strategies, risk acceptance, perceived safety  
Conflict safety versus economy

#### 2. Main risk areas in aviation

Human, Technical, Environment, Organization  
Analyses of incidents and formulation of recommendations  
Evaluation and interpretation of accident and incident statistics

#### 3. Human Factor

Pilot's Attitude to Flight Safety  
Target fixation  
Complacency  
Follow my leader syndrome  
Discipline  
Engagement  
Social competence

#### 4. Man - Machine - Interface

Pilot's performance and pilot's capacity  
Ergonomic requests for flight safety  
The use of cockpit computer systems  
Reliability of databases

#### 5. Risk areas (case studies):

RTO  
CFIT  
ALA

#### 6. Organization structure for a Low Risk Flight Operation

#### 7. Safety Culture, Safety Management

### ■ Didactic approach

Lecture and analysis of actual cases

Group work

Case studies (correlated with the module MFPS)

### ■ Proofs of academic achievement

Preparing two presentations:

1. Basic contents of the RMAN-Course
2. Case study: Chain of events, recommendations, implementation



## Simulation of Logistic Aviation Systems (SLAS)

### ■ Course aims

Based on the principles of aviation management this module covers the understanding and application of the interdependency between the various parties in aviation industry. Understand the role and connectivity of aircraft producers, airlines, air traffic systems, airports and legal authorities.

### ■ Course contents

- Contents and topics of the course are presented on the case study of the project "A380 entry into service" as follows
  - Overview A380
  - Dimensions and technical aspect
  - Challenges for airlines
  - Challenges for airports / facility management
  - Challenges for air traffic control
  - Challenges for legal and federal authorities
- Aircraft orders, economical aspects, strategic decisions and implementation of this aircraft in airline-operation
- Complexity in airline management

### ■ Didactic approach

- Lectures
- Group work
- Home studies
- Computer based simulation and practical training

### ■ Proof of academic achievement

- written exam
- viva (oral examination)
- group work
- case studies

 **Modelling and Simulation (MAS)****■ Course aims**

The course aims on implementing a basic understanding of the role and methodology of modeling and simulation within the aerospace community. It gives a brief introduction into simulation in general as well as training in particular and then focuses on mathematical abstraction and modeling of various aerial vehicles.

**■ Course Content**

The course is split into theoretical and practical part, the former dealing with the aspects of

**INTRODUCTION TO SIMULATION  
AND SIMULATORS**

- Motion
- Visual
- Databases

**TRAINING**

- General Considerations
- Training Regulations and Requirements
- Methods

**MODELING**

- Flight Physics: Equations of Motion (EOM)
- Aerodynamics
- Modeling and Data Representation;  
Data Sources; Validation
- Scheduling and Data Exchange

**COMPONENTS**

- Flight Control Systems
- Navigation System

In the practical part the students are required to build an aircraft simulation model from scratch in the MATLAB® / SIMULINK® environment.

**Option**

- Introduction to System Safety Assessment

**Option**

- Visit to RDE Facilities including Avior demo
- Participation in UAV flight test

**■ Didactic approach**

Lectures

Practical training by computer work

Group work

**■ Proof of academic achievement**

Preparation of simulations (case studies)  
by computer work  
Oral examination