Master of Science (MSc) Program in International Air Transport Operations Management

Program Director:
Xun HUANG, Associate Professor of Mechanical and Aerospace Engineering

The Master of Science (MSc) program in International Air Transport Operations Management is jointly offered by the School of Engineering of HKUST and Ecole Nationale de l’Aviation Civile (ENAC) in Toulouse, France. The program aims to equip those who want to enter the positions for versatile managers, air transport professional or to enhance the knowledge of those who have already been working in the sector.

The program combines the technical, economic and managerial skills that are specific to air transport which will improve and enhance the capabilities of students supporting engineering work for the aeronautics and air transport. It will allow students to get exposure to the various core aspects of air transport and how they are integrated with the technology development in the real world. Upon graduation, students shall be awarded a joint Master of Science degree in International Air Transport Operations Management by HKUST and ENAC. A separate certificate recognized by the French Ministry of Higher Education will also be issued by ENAC.

Program Learning Outcomes

On successful completion of the program, graduates will be able to:

• Apply mathematics, mechanics, and/or control principles, and a knowledge of materials and structures, to ensure safe and efficient flight operations;
• Analyze existing aeronautical engineering problems in depth;
• Design and operate complex systems from a conceptual design perspective;
• Identify and explain the aircraft safety system through the design principles;
• Identify and explain the main aspects of the aircraft maintenance management and explain how the maintenance is certified;
• Explain the operational and economic constraints associated to aircraft operations;
• Describe and explain the major issues and challenges facing international air transport operations management;
• Distinguish between the elements and processes of certification, airworthiness and operational control;
• Explain the basic fundamentals of human resources management, taking into account the peculiarities of air transport;
• Analyze and provide possible solutions to problems related to the flight planning and crew management in all their aspects (technical, regulatory, human); and
• Explain technical, regulatory and legal concepts and practices to members of the air transport industry through individual written communications.
Admission Requirements

Applicants must have a bachelor’s degree in Aeronautical Engineering / Aerospace Engineering / Mechanical Engineering / Manufacturing Engineering / Engineering Management / Materials Science and Engineering / Electrical and Electronic Engineering / Civil Engineering / Environmental Engineering / Industrial Engineering, or a related field from a recognized university or tertiary institution. Applicants with a bachelor’s degree in other non-engineering disciplines must have relevant working experience in the air transport industry or aviation related fields.

Program Duration

The normal duration for program completion is two years in full-time mode.

Program Fee

The program fee is HK$215,000. New students admitted with credit transfer are also required to pay the full program fee. Students who take additional courses or need to retake any courses are required to pay additional fee.

Curriculum

Students are required to complete a total of 60 credits (120 ECTs), including 1st term of 18 credits (36 ECTs) of courses at HKUST, 2nd & 3rd terms of a total of 27 credits (54 ECTs) of courses at ENAC, and a 6-month internship of 15 credits (30 ECTs) in the air transport industry. All courses will be taught in English.

a) 1st Term at HKUST (18 credits / 36 ECTs)

Students are required to take at least 9 credits of foundation courses. The remaining credits can be taken from the foundation or elective courses. Subject to the approval of the Program Director, students may take a maximum of 9 credits of courses from outside the following course lists:

Foundation Courses

- AESF 5210 Fluid Dynamics
- AESF 5310 Advanced Aerodynamics
- AESF 5320 Advanced Aircraft Structures
- AESF 5330 Advanced Aircraft Design
- AESF 5340 Aircraft Flight Dynamics
- AESF 5350 Aircraft Propulsion
- AESF 6950 Aeronautical Independent Project
- EEMT 5220 Six Sigma Quality Management

Elective courses

- AESF 5050 Fracture Behavior of Polymers
- AESF 5311 Robotics: Mechanics and Control
- AESF 5360 Advanced Flow Instability
AESF 5370  Composites and Nanocomposites  
AESF 5380  Computational Fluid Dynamics  
AESF 5390  Computational Aeroacoustics  
AESF 5410  Advanced Mechanical Behavior of Materials  
AESF 5930  Finite Element Methods  
AESF 6910  Special Topics  
EEMT 5120  Operation/Production Management

b) 2nd Term at ENAC (12 credits / 24 ECTs)

- Design Principles
- Production Process
- Operator’s Responsibilities
- MRO Constraints
- Manufacturer’s Role
- Safety Management System

In order to start the 3rd term, a student has to complete 30 credits / 60 ECTs.

c) 3rd Term at ENAC (15 credits / 30 ECTs)

- Aircraft Performances Optimization – Specialization
- Flight Control System
- Maintenance Management and Engineering
- Airspace Organization and ATM
- Airline Strategy
- Marketing, Customer Support and Fleet Management
- Human Resources Management
- Fleet Planning and Crew Management
- Social Sciences

d) 4th Term (15 credits / 30 ECTs)

- Internship

Credit Transfer

Credit transfer may be granted to students in recognition of studies completed successfully elsewhere. Application must be made to the program office within the first term after admission. All credit transfer must be approved by the Program Director and are subject to the normal university, school, and program requirement on credit transfer.

Graduation Requirements

Students must complete all prescribed courses to graduate. Students must complete the program with a cumulative grade average (CGA) of 2.85 for courses taken at HKUST and a graduation grade average (GGA) of 12 (of a 20-point scale) or above.
for courses taken at ENAC. Students failing to meet the CGA requirement of HKUST are required to repeat or substitute the course(s) at HKUST at a per-credit fee. Students failing to meet the GGA requirement of ENAC are required to repeat or substitute the course(s) at ENAC at a per-credit fee.