Commercial air transport Business should double before 20 years according to the most realistic forecasts. Therefore ICAO, States, Authorities of the Civil aviation should anticipate and prepare technically and operationally this growth by, establishing and implementing an effective global air navigation services system, absorbing the air traffic growth by a more integrated flight management into their different phases, reducing waiting times on the ground or during flight, and implementing new optimized operational concepts for eco-effective trajectories.

Objectives

The new advanced master “Air Navigation Systems Engineering and Operations “, MS ANSEO, is based on a systemic approach of Air Navigation System, on an unique and integrated programme with opened to three operational options: ATM, CNS/GNSS and Avionics. The ANSEO Advanced Master role is to educate new generation of Air Navigation Systems experts providing up-do-date skills and transverse knowledge to develop and operate the Air Navigation System meeting the worldwide Air Transport challenges.

Future graduates of ANSEO Advanced Master will be qualified managers of interdisciplinary teams to develop or to improve technical Air Navigation Systems, whether at sub-system level (aircraft, ground, management of air traffic) or for architecture systems integrating interactions between these sub-systems. They will acquire advanced monitoring techniques and legal and regulatory awareness of the global Air Navigation System. As a result they will be able to monitor and optimize system evolution, at either the equipment or system level, or to propose operational and technical road maps, and define development and operational standards.

Whether it is for senior engineers or for juniors in their first years of professional life, the ANSEO Advanced Master will give the best means, for understanding the complexity of technical Air Navigation systems. This will allow graduates to develop adapted solutions, to make decisions and to take the most relevant technical and operational choices which meet their particular needs while satisfying overall worldwide objectives.

ANSEO Advanced Master options

The ATM option prepares future engineers for developing and improving the operational efficiency of
air navigation systems and air traffic management operations thanks to a thorough knowledge of interactions between the various actors of air transport.

The Avionics option prepares future engineers for designing, developing, integrating or testing, as well as for the certification or maintenance of any avionics system. They benefit from comprehensive mastery of associated legal, regulatory, technical and operational aspects.

The CNS/GNSS option prepares future engineers for developing and implementing the advanced systems which ensure air navigation services. These include systems such as communication, navigation and surveillance, and in particular satellite navigation systems by satellite, thanks to their comprehensive mastering of legal, regulatory, technically and operational associated aspects.

**Programme**

Common Program : 296 h

**General introduction of Air Navigation Technical systems**

- Aircraft & Introduction to avionics systems
- ATM overview
- CNS overview
- Regulatory framework
- Safety
- Project Management
- System Engineering

Avionics option : 240h

- Airborne Systems engineering
- Software development & networking basics
- Avionics architecture
- Flight control systems
- Human factors
- Avionics certification
- Airborne CNS systems
- Air/ground collaborative applications (for airlines and ATM)

CNS/GNSS option : 241h

- Safety SAM
- Space telecommunications
- GPS L1 C/A signal and signal processing in receiver
- Basic PVT computation
- Advanced GNSS positioning
- Future GNSS systems
- Advanced communication systems for civil aviation
- Advanced navigation systems – GNSS for civil aviation
- Advanced surveillance systems for civil aviation

Air Traffic Management (ATM) Option: 232h

- Safety SAM
- Integration of ATM in airport design and operations
- ATM operations (ACC)
• Airspace design
• ATM sustainable development
• Advanced ATM
• Towards business perspectives

Requested language qualification:

• BULATS : 60-74
• TOEIC : 785-944
• TOEFL (IBT) : 87 - 109
• TOEFL (CBT) : 180 – 226
• TOEFL (PBT) : 505 – 564
• CAMBRIDGE : First (FCE) Business Vantage (BEC)
• IELTS : 5 – 6
• PTE : 3
• DCL : D2
• CLES : 2
• CERCRL : B2

Selection and admission made by admission committees organized from January to July.

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