AEC1 - AEC* of Avionics & Systems

From the Advanced Master ASAA

(Aviation Safety: Aircraft Airworthiness)

* Aircraft Engineering for Certification

Key elements

Period: **December to January**

Estimated duration: **75 hours**

For whom:
recent graduates, jobseekers and experienced employees

Location:
ISAE-SUPAERO, Toulouse

Language: **English**

Highlights

- Certification approach for avionics
- Introduction to connected aircraft
- Unique coverage of general systems
- Industrial expertise & technical visits

This certificate provides the essential knowledge of airplane's avionics systems and Integrated Modular Avionics (IMA), as well as an overall understanding of aircraft major general systems and commercial cabin installation.

It defines and explains their key design characteristics, performances and limitations, and the associated key certification requirements and means of compliance as per authorities' regulations.

Prerequisites

- Aircraft certification process and procedures
- Aircraft architecture and basic aeronautics knowledge
- FAR/CS25 safety objectives and basic knowledge of safety analysis

* not compulsory

Learning objectives

After completing this course, participants will be able to:

- Describe functional architectures of avionics systems;
- Determine and implement certification processes and requirements applicable for avionics systems;
- Evaluate the main certification challenges of future air navigation systems and future connected aircraft;
- Describe functional architectures, components and principles for safe design of aircraft general systems and cabin installation;
- Describe the main functioning and failure modes of aircraft general systems and cabin installation in order to evaluate their compliance to certification requirements;
- Determine and implement certification processes, requirements and means of compliance applicable for aircraft general systems;
- Collect and analyze in-depth and autonomously relevant regulatory certification documents for General Systems and Cabin/Cargo/Cockpit Safety domains.

Information and registration

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Course content

AW9 – Avionics (28h):

Communication, Navigation and Surveillance

- Communication
- Radionavigation – Precision approach
- Satellite-based navigation and landing procedures
- Performance-based procedures
- Surveillance (TAWS, ACAS, Transponder/ADS)
- Future Air Navigation System

Aircraft Monitoring System

- Centralized monitoring system
- Flight warning system

Autoflight System and Flight Management System

- Flight management functions
- Autoflight and autoland modes, logics and laws

Integrated Modular Avionics (IMA)

- IMA architecture, functions and integration
- IMA certification approach and requirements

Connected aircraft

- Introduction to connected aircraft and related existing and future functions
- Safety and certification challenges

AW10 – General Systems & Cabin (52h):

Electrical Systems

- System architecture and certification requirements

Fuel Systems

- System architecture, fuel tank safety and certification requirements

Landing Gears

- System architecture and certification requirements

Pneumatic Systems

- Architectures of Bleed system, Environmental Control System, Pressurization, Pneumatic Ice Protection
- Certification requirements

Hydraulic Systems

- Hydraulic power generation architecture and components
- Certification requirements

Flight Controls

- Architectures and components
- Safety and certification requirements

Cabin Safety

- Cabin and cargo area certification
- Cabin fire protection and crashworthiness
- Design for security

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Teaching methods

Teaching methods	Yes
Lectures / tutorial	X
Collaborative learning	
Flipped classroom	
Blended learning (online and face to face)	
Learning by doing	X
Project-based	
Simulation	
Case study	X

Assessment

Written exams