AW7 - Flight

From the Advanced Master ASAA (Aviation Safety: Aircraft Airworthiness)

Key elements

Period: **Late September to Early December**

Estimated duration: **40 hours**

For whom:
recent graduates, jobseekers and experienced employees

Location:
ISAE-SUPAERO, Toulouse

Language: **English**

Highlights

- Engineering & certification
- Wide coverage of flight dynamics
- Flight telemetry session

This module provides an overall understanding of jet airplane flight dynamics and performances. It defines and thoroughly explains the related key characteristics and criteria and the associated EASA CS-25 / FAA FAR-25 requirements for certification.

Prerequisites

- A good engineering background
- Basic knowledge of aircraft certification process and procedures

Learning objectives

After completing this course, participants will be able to:

- Describe and calculate airplane flight dynamics and performances parameters;
- Describe the parameters and criteria essential, from a safety perspective, to evaluate performances, handling qualities, stability and control and their relationship;
- Explain the main Flight certification requirements as per CS-25/FAR-25 Subpart-B, their relationship with flight dynamics and performances parameters, and the associated means of compliance;
- Collect and analyze in-depth and autonomously relevant regulatory certification documents for Flight domain.

Information and registration

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Course content

Principles of straight and steady level flight

- Straight and level steady flight physics & performance
- International standard atmosphere, pressure, altitude, true airspeed and indicated airspeed
- Airplane propulsion

Airplane performance

- High speed cruise performance: Mach number - Transonic and supersonic aerodynamics - Endurance and range at high altitude
- Climb and acceleration performance: Equations – Climb at constant CAS/Mach - Optimum climb speeds – Propulsion ceiling and certified performance
- Maneuvering performance: Lift and normal acceleration – Load factor – Flight envelope
- Take-off and landing performance: Ground roll – High-lift configurations – Performances determination and certification criteria
- Weather phenomena affecting aircraft performance

Handling qualities

- Center of gravity envelope
- Primary flight controls: forces, moments, deflections – Certification requirements – Trim
- Handling qualities certification requirements

Stability and control

- Longitudinal and lateral stability and control: Definitions and principles - Certification requirements
- Dynamic stability: Airplane natural modes – Longitudinal and lateral modes (phugoid and short-period oscillation, Dutch roll)

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	X
Case study	

Assessment

Written exam