

# AW7 - Flight

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



## Highlights

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

## Key elements

Dates: **November 23 to December 2, 2022 (exam: December 2)**

Duration: **43 hours**

For whom:  
**recent graduates, jobseekers and experienced employees**

Location:  
**ISAE-SUPAERO, Toulouse**

Course fees: **€ 2,900**

Language: **English**

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.

## Practical 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