THE2 - Helicopter dynamics

From the MS HADA
(Helicopter, Aircraft and Drone Architecture)

Key elements

Period: **March**

Duration: **30 hours**

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

Location: **AIRBUS HELICOPTERS, Marignane**

Language: **English**

Highlights

- Helicopter vibrations
- Aeroelasticity and Aeromechanics instabilities
- Helicopter Acoustics

This module provides a thorough overview of all helicopter dynamics, ranging from vibrations, elasticity, instabilities and acoustics.

Learning objectives

After completing this course, participants will be able to:

- to describe vibratory and acoustic phenomena in depth under the aspects of stability, fatigue/reliability, monitoring for safety/maintenance and onboard comfort optimization.

Prerequisites

- Basics of aerodynamics

Information and registration

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Course content

Helicopter vibrations:

- Rotor technologies & dynamics
- Structural dynamics
- Rotor balancing theory, rotor tuning methods
- Anti-Vibration device
- Impact of vibrations on Health and Comfort & on equipment reliability
- Health & Usage monitoring systems

Aeroelasticity and Aeromechanics instabilities:

- Flutter
- Rotor/fuselage couplings
- Ground & air resonance
- Rotor and fuselage sizing to avoid ground resonance - application
- Drive train torsional instability
- Shaft bending instability
- Active control of dynamic instabilities

Acoustics:

- Helicopter internal noise
- Noise measurements & reduction techniques
- Acoustics and psychoacoustic metrics, health impacts
- Noise sources (rotor noise, aerodynamic noise, mechanical noise)
- Diagnosis/identification of a noise problem
- Helicopter Acoustical simulation

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 exam