THE2 - Helicopter dynamics
From the MS HADA
(Helicopter, Aircraft and Drone Architecture)

Highlights

- Helicopter vibrations
- Aeroelasticity and Aeromechanics instabilities
- Helicopter Acoustics

Key elements

Dates: March 13 to 17, 2023
Duration: 28 hours
For whom: recent graduates, jobseekers and experienced employees
Location: AIRBUS HELICOPTERS, Marignane
Course fees: €2,300
Language: English

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

Prerequisites

- Basics of aerodynamics

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.

Practical 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

**Aerelasticity 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

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<thead>
<tr>
<th>Teaching methods</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Lectures / tutorial</td>
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<tr>
<td>Collaborative learning</td>
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<td>Flipped classroom</td>
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<td>Blended learning (online and face to face)</td>
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<td>Learning by doing</td>
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<td>Project-based</td>
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<td>Simulation</td>
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Assessment

Written exam