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

Key elements

Dates: 15 - 19 March 2021
Duration: 31 hours
For whom: recent graduates, jobseekers and experienced employees
Location: AIRBUS HELICOPTERS, Marignane
Course fees: 2 300 €
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

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

<table>
<thead>
<tr>
<th>Teaching methods</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Lectures / tutorial</td>
<td>X</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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<td>Case study</td>
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Assessment

Written exam