THE3 - Helicopter materials & technology

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

Key elements

Period: March
Estimated duration: 30 hours
For whom: recent graduates, jobseekers and experienced employees
Location: AIRBUS HELICOPTERS, Marignane
Language: English

Highlights

• Materials & technology for airframe, blade, rotor systems for helicopter
• Metallic & composite parts on helicopter
• Design and static & fatigue justification for helicopter

This module provides a thorough overview of helicopter materials and technologies.

Learning objectives

After completing this course, participants will be able to:
• To manage all general architecture aspects, especially sub systems integration constraints,
• To assess in depth sub systems functions and performances,
• To identify helicopter production materials and technologies,
• To implement stress calculation using Finite Element Method.

Prerequisites

• Basics of engineering

Information and registration
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Course content

- Logic of evolution towards single rotor formula
- Architectural criteria
- Optimization paths for single rotor formula
- Structure technology - Landing gears
- Composite and metal structures
- Wheel and friction pad landing gears
- Blade technology
- Design criteria
- Rotor hub technology
- Anti-coupling rotor hubs
- Gear system mechanisms
- Architecture and motion of gearboxes
- Gearings & lubrication
- Mechanical element stress & fatigue (metal parts)
- Theory and origin of fatigue on helicopter
- Stress calculation via Finite Element Method
- Key parameter driving fatigue limit
- Application to structures (sizing, Flight load measurement, bench test)
- Damage tolerance
- Composite materials and parts
- Comparison of composite and metal technologies
- Mechanical behavior and characteristics

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>
<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