This module provides a comprehensive understanding of aircraft loads, structure fatigue and their effects for ageing aircraft, aeronautical materials. Maintenance aspects of structure are covered through an overview of non-destructive test (NDT) techniques and additive layer manufacturing applications.

Prerequisites
- Aircraft architecture and basic aeronautics knowledge
- Engineering background.

Learning objectives
After completing this course, participants will be able to:
- Describe ground loads and flight loads applied to an aircraft;
- Describe fatigue phenomena and fatigue damages, and the related in-service consequences;
- Perform basic fatigue calculations;
- Describe the different currents NDT techniques and their application in aircraft maintenance.

Key elements
Dates: October 10 to 27, 2022 (exam November 15)
Duration: 48 hours
For whom: recent graduates, jobseekers and experienced employees
Location: ISAE-SUPAERO, Toulouse
Course fees: €2,900
Language: English

Highlights
- Fatigue & damage tolerance
- Non-destructive test practical
- Industrial expertise

Practical information and registration
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AMS103a - Aircraft structure and materials for aircraft maintenance engineer
From the Advanced Master AMS: E&M
(Aeronautical Maintenance and Support: Engineering & Management)
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Course content
Aircraft loads:
• Flight loads
• Ground loads

Fatigue and ageing aircraft:
• Fatigue phenomena generalities
• Endurance, initiation, propagation
• Fracture mechanics
• Widespread fatigue damage
• Fatigue and damage tolerance for composite structures
• In-service monitoring and fatigue tests
• Case studies

Aeronautical materials:
• Performance requirements of airframe and engines materials
• Selection criteria (technical, technological, economic, strategic)
• Usage properties
• Review of civil and military materials applications

Non-destructive tests:
• Procedures
• Damages detection processes
• Review of existing techniques
• Practicals

Introduction to additive layer manufacturing:
• Principles
• Application to maintenance
• Regulatory challenges

Teaching methods

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<th>Teaching methods</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>Simulation</td>
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Assessment
Written test + Marked seminars