AMS103a – Aircraft structure and materials for aircraft maintenance engineer

From the Advanced Master AMS: E&M
(Aeronautical Maintenance and Support: Engineering & Management)

Prerequisites

- Aircraft architecture and basic aeronautics knowledge
- Engineering background.

* not compulsory

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:
12 - 27 Oct. & 3 Nov. 2020
(exam: 19 November 2020*)

Duration: 49 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

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.

Practical information and registration

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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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<tr>
<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