

AMS103a - Aircraft structure and materials for aircraft maintenance engineer

From the Advanced Master AMS: E&M

(Aeronautical Maintenance and Support:
Engineering & Management)



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.

Prerequisites

- Aircraft architecture and basic aeronautics knowledge
- Engineering background.

Key elements

Period: **October**

Estimated duration: **50 hours**

For whom:

recent graduates, jobseekers and experienced employees

Location:

ISAE-SUPAERO, Toulouse

Language: **English**

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 current NDT techniques and their application in aircraft maintenance.

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

Teaching methods	Yes
Lectures / tutorial	X
Collaborative learning	
Flipped classroom	
Blended learning (online and face to face)	
Learning by doing	X
Project-based	
Simulation	
Case study	X

Assessment

Written test + Marked seminars