

Trusted Digital Infrastructure for Aviation MRO: Data, Integration, and Decision Systems

OEM: SAE International • Code: C2607

COURSE DESCRIPTION

This course examines the digital foundations that make MRO 4.0 systems reliable, secure, and certifiable. You'll develop a practical understanding of how digital twins support predictive maintenance and lifecycle decision-making, the challenges of keeping them accurate and well-governed, and the cybersecurity risks that emerge across MRO ecosystems. All this is explored through the lens of certification and operational trust to be accepted as evidence in safety-critical decisions.

AUDIENCE PROFILE

- Aerospace engineers, Maintenance, Repair and Overhaul professionals in aerospace and defense who are involved in maintenance, reliability, digital transformation, cybersecurity, or lifecycle support.

PREREQUISITES

- This course is intended for professionals who are already familiar with maintenance engineering concepts and are seeking a deeper understanding of how AI-enabled predictive maintenance and autonomous inspection systems are designed, deployed, and certified in safety-critical environments.

COURSE OBJECTIVES

By the end of this course, participants will be able to:

- Explain the role of digital twins in supporting predictive maintenance and lifecycle decision-making.
- Evaluate digital twin fidelity, calibration, and lifecycle management challenges.
- Identify cybersecurity risks in connected MRO ecosystems including IoT networks, digital twins, and maintenance data pipelines.
- Assess strategies for securing digital maintenance infrastructure and ensuring data integrity.
- Understand how trusted digital infrastructure supports certification and operational adoption of digital MRO systems.

COURSE OUTLINE

Module 1

- Why Digital Infrastructure Becomes the Real Bottleneck

- What Trusted Digital Infrastructure Actually Means
- The Aviation Data Stack: From Aircraft to Action
- Interoperability, Digital Thread, and Cross-Organization MRO
- Trust, Authority, and Evidence
- Case Studies: Real Infrastructure Successes and Failure Modes
- Readiness Assessment for Trusted MRO Infrastructure
- Applied Exercise: Can This MRO System Be Trusted?
- Future Direction: From Digital Tools to Trusted Digital Ecosystems