



MAINTENANCE AND ENGINEERING | ME-012

Digital Twins for Asset Management and Operations

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Course content

Why Attend

A digital twin is a living digital model of a physical asset, system or facility, continuously updated with sensor, maintenance and operating data. Oil and gas operators, utilities, airports, manufacturers and large real estate and infrastructure projects are using digital twins to predict failures, test changes before making them, optimise energy use and train staff safely. Yet many initiatives stall because they start with technology instead of a clear business question and reliable data.

This Aractech course explains digital twins in practical, non-vendor terms for engineering, maintenance and operations professionals. Participants learn the types and maturity levels of digital twins, the data foundations they need (asset registers, IoT, historians, CMMS, BIM and GIS), and how analytics, simulation and AI turn that data into decisions on maintenance, reliability, performance and capital planning. The course links digital twins to recognised asset management practice, including ISO 55000.

Course Methodology

- Expert briefings illustrated with industrial and infrastructure examples
- Demonstrations of digital twin platforms and visualisation
- Case studies from oil and gas, utilities, manufacturing and buildings
- Workshops on use-case selection, data architecture and business case
- Capstone digital twin roadmap for each participant's asset or facility

Course Objectives

- Explain what digital twins are, their types and maturity levels
- Identify high-value digital twin use cases across the asset lifecycle
- Define the data foundations: asset registers, IoT, historians, CMMS, BIM and GIS
- Understand how simulation, analytics and AI support predictive maintenance and optimisation
- Design a digital twin architecture and integration approach
- Link digital twins to asset management practice and ISO 55000

Course content

Target Audience

- Maintenance, reliability and asset managers
- Plant, operations and facilities managers
- Engineering and asset integrity professionals
- Digital transformation and Industry 4.0 teams

Course outline

Detailed course outline

Day-by-day outline for Digital Twins for Asset Management and Operations.

Day 1 - Digital Twin Fundamentals

- 09:00-10:00 | What a digital twin is and how it differs from a 3D model or simulation
- 10:00-10:30 | Component, asset, system and process twins
- 10:30-11:00 | Digital twin maturity levels: descriptive to autonomous
- 11:00-11:30 | Coffee break
- 11:30-12:00 | Industry 4.0, IoT and the role of digital twins
- 12:00-13:00 | Value across the asset lifecycle: design, build, operate, maintain
- 13:00-14:00 | Workshop: identifying digital twin opportunities in your operation

Day 2 - Data Foundations and Architecture

- 09:00-09:39 | Asset registers, hierarchies and data standards
- 09:39-10:18 | Sensors, IoT, SCADA and process historians
- 10:18-10:57 | Integrating CMMS, ERP, BIM and GIS data
- 10:57-11:00 | Data quality, ownership and master data management
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Data quality, ownership and master data management (continued)
- 12:05-12:43 | Cloud, edge and platform architecture options
- 12:43-14:00 | Practical exercise: designing the data model for a critical asset

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Day 3 - Analytics, Simulation and AI

- 09:00-09:34 | Condition monitoring and anomaly detection
- 09:34-10:08 | Predictive maintenance and remaining useful life models
- 10:08-11:00 | Physics-based and data-driven simulation
- 11:00-11:30 | Coffee break
- 11:30-11:45 | Physics-based and data-driven simulation (continued)
- 11:45-12:19 | What-if scenarios for operations, energy and capacity
- 12:19-12:53 | Visualisation and dashboards for decision-makers
- 12:53-14:00 | Case study: a digital twin for rotating equipment reliability

Day 4 - Digital Twins in Asset Management Practice

- 09:00-09:39 | Linking digital twins to ISO 55000 asset management
- 09:39-10:18 | Risk-based maintenance and reliability-centred decisions
- 10:18-10:57 | Energy and performance optimisation
- 10:57-11:00 | Capital planning, lifecycle cost and renewal decisions
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Capital planning, lifecycle cost and renewal decisions (continued)
- 12:05-12:43 | Using digital twins for training and safe operations
- 12:43-14:00 | Workshop: building the business case and KPIs for a digital twin

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Day 5 - Implementation, Governance and Scaling

- 09:00-09:39 | Selecting vendors and platforms
- 09:39-10:56 | Pilot design, success criteria and scaling
- 10:56-11:00 | Cybersecurity for connected operational assets
- 11:00-11:30 | Coffee break
- 11:30-12:05 | Cybersecurity for connected operational assets (continued)
- 12:05-12:44 | Organisation, skills and change management
- 12:44-13:22 | Keeping the twin accurate: governance and data maintenance
- 13:22-14:00 | Capstone: presenting a digital twin roadmap

Seminar dates

Available seminar dates

Live dates and pricing for Digital Twins for Asset Management and Operations generated from the course details page.

Date	Location	Format	Fee
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No seminar dates are currently available.