

The AI-Powered Factory

Practical AI for Production, Quality and the Factory Floor

FA-0822 · 1 day

Agentic & Generative AI · AI for Leaders & Business · Data & Analytics · Embedded Systems and Hardware

Explore connected manufacturing systems, analyse sample production records with AI, use operational documents responsibly and plan a measurable factory pilot.

Introduction

Manufacturing teams make decisions every day about downtime, defects, materials and delivery commitments. Connected machines and digital records provide valuable information, but turning that information into useful action requires more than collecting data. This course explores how smart manufacturing systems and AI can support those decisions, connecting factory operations with practical tools for analysis, knowledge retrieval and workflow automation.

Participants explore how sensors, industrial systems and enterprise applications work together, then use AI with non-confidential sample manufacturing records and operational documents. The emphasis is on understanding which problems suit predictive models, computer vision, generative AI or conventional automation, and how to evaluate results before acting on them. Maintenance, quality, production and inventory provide the operational context throughout.

The focus is on practical operational decisions: checking evidence, identifying where AI is useful and defining a manageable pilot. Selected guided exercises use sample data and documents; the day does not involve deploying models or connecting AI agents to live production equipment.

Learning outcomes

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

- Explain how IIoT, connected systems and enterprise integration support smart manufacturing.
- Identify suitable uses for predictive AI, computer vision, generative AI and workflow automation.
- Use AI to analyse sample manufacturing records, check calculations and prepare operational summaries.

- Use operational documents to guide AI responses and check the evidence supporting those responses.
- Recognise data, cybersecurity and safety requirements for manufacturing AI.
- Define a practical AI pilot with success measures and human oversight.

Prerequisites

- Working experience in manufacturing operations, including interpreting production, quality or maintenance records.
- A laptop with a current web browser and spreadsheet software.
- Reliable internet access.
- Access to an AI tool with file-upload and data-analysis features; account permissions and feature limits must support the selected exercises.

Training outline

1. Connected Factory Foundations

1. Industry 4.0 and industrial AI
2. IIoT sensors, production monitoring and traceability
3. Production, inventory and enterprise system integration
4. Edge computing, cloud systems and digital twin fundamentals, including their data and integration requirements

2. AI Applications Across Manufacturing

1. Predictive maintenance and anomaly detection
2. Computer vision for quality inspection
3. Opportunities and constraints for production scheduling, inventory and energy optimisation
4. Selecting between predictive AI, generative AI and conventional automation

3. Using AI with Manufacturing Data

1. Data preparation, quality checks and operational context
2. AI-assisted analysis of sample downtime, scrap and production-performance records
3. Checking source evidence and calculations before preparing operational reports

4. Factory Copilots and Workflow Automation

1. Prompting with sample manuals, procedures and maintenance records
2. AI-assisted shift summaries and troubleshooting suggestions, checked against approved procedures
3. AI agents, workflow triggers and human approval checkpoints in bounded examples

5. Reliable and Secure AI Use

1. Hallucinations, model limitations and output validation; supplying documents does not guarantee correct answers
2. Operational technology security and confidential data: approved tool access, information boundaries and non-confidential practice material
3. Human oversight, safety boundaries and escalation; AI suggestions do not replace approved operating procedures

6. From Opportunity to Practical Adoption

1. Use-case prioritisation and integration readiness
2. Pilot scope, performance baselines and estimated return on investment, with assumptions, costs and success measures
3. Workforce adoption and ongoing performance monitoring

Disclaimer

This course outline serves as a general guide to the intended coverage. The trainer reserves the right to amend, adapt or reorder the content, tools and delivery approach, without prior notice, to reflect participant needs, available resources, technological developments and professional judgement.