

Smart Manufacturing and Industry 4.0 Training Course

6 – 10 June 2027
Doha

AGILE LEADERS
Training Center

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Overview

Smart Manufacturing and Industry 4.0 Training Course is a one-week practical course for manufacturing managers, industrial engineers, production leaders, automation specialists, maintenance and quality professionals, and transformation teams. Participants build a Smart Factory Roadmap Pack connecting maturity assessment, business priorities, cyber-physical production, industrial IoT, OT/IT integration, manufacturing data, MES and ERP interfaces, digital twins, analytics, cybersecurity, pilot design, KPIs, and scale-up. Agile Leaders Training Center develops governed factory transformation rather than isolated technology demonstrations.

Who Should Attend

- Manufacturing and plant managers responsible for performance, investment, workforce, and transformation priorities
- Industrial and production engineers designing connected workflows and measurable improvement use cases
- Automation, controls, OT, IT, MES, and enterprise-architecture personnel planning system integration
- Maintenance, reliability, quality, energy, and supply-chain professionals using manufacturing data
- Digital transformation, cybersecurity, data, analytics, and programme teams coordinating pilots and scale-up

Participants should understand basic production processes and factory systems. The course does not teach PLC programming, configure a specific vendor platform, build production AI models, or replace detailed cybersecurity engineering and functional-safety studies.

Departments and Industries

The course supports discrete, batch, and continuous manufacturing environments pursuing connected and data-enabled operations.

- Automotive, aerospace, electronics, machinery, and industrial equipment manufacturing
- Food, beverage, pharmaceutical, chemical, metals, cement, and process industries
- Production, industrial engineering, automation, maintenance, quality, and operations excellence
- OT, IT, MES, ERP, data, cybersecurity, and enterprise architecture functions
- Strategy, capital projects, innovation, sustainability, and workforce-development teams

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Learning Objectives

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

- Assess smart-manufacturing maturity across process, technology, data, people, governance, and cybersecurity.
- Map physical production, sensors, controls, manufacturing operations, and enterprise systems using a reference architecture.
- Select IIoT, connectivity, MES, data-platform, digital-twin, analytics, and AI use cases tied to operational value.
- Define information ownership, interoperability, data-quality, cybersecurity, and lifecycle requirements.
- Prioritize a pilot through value, feasibility, risk, readiness, dependencies, and measurable success criteria.
- Build a phased Industry 4.0 roadmap with investment logic, workforce actions, KPIs, governance, and scale-up gates.

Course Agenda

Day 1: Assess Smart Manufacturing Readiness

- Industry 4.0 Value, Scope, and Connected-Factory Boundary
- Process, Technology, Data, People, Governance, and Security Maturity Model
- Current-State Production Flow and Digital Pain-Point Map
- Business Objective, Loss, Constraint, and Opportunity Register
- Smart Manufacturing Vision and Transformation Principles

Day 2: Design the Connected Factory Architecture

- Physical Process, Sensor, Device, Control, Operations, and Enterprise Layers
- Industrial IoT Connectivity, Edge, Gateway, Network, and Platform Options
- MES, SCADA, Historian, QMS, CMMS, ERP, and Planning-System Boundaries
- OT/IT Integration and Manufacturing Information-Exchange Map
- Asset, Product, Process, Work, Quality, and Performance Data Ownership

Day 3: Select Smart Manufacturing Use Cases

- Real-Time Visibility, OEE, Traceability, Quality, Energy, and Flow Use Cases
- Predictive Maintenance, Anomaly, Inspection, Scheduling, and Decision Support
- Digital Twin Purpose, Scope, Model, Data, Verification, and Lifecycle
- Use-Case Value, Feasibility, Data, Integration, Workforce, and Risk Screen
- Portfolio Prioritization and Dependency Map

Day 4: Govern Data, Cybersecurity, and Change

- Manufacturing Data Quality, Context, Master Data, Lineage, and Access Controls
- OT Asset Inventory, Zones, Connections, Identity, Change, and Monitoring
- Cybersecurity Risk and Secure-by-Design Pilot Requirements
- Human-Machine Roles, Skills, Adoption, Work Design, and Operating Procedures
- Architecture, Data, Security, Safety, and Investment Decision Gates

Day 5: Build and Scale the Roadmap

- Suggested Exercise: Complete a Smart Manufacturing Maturity Assessment
- Suggested Exercise: Map OT, MES, Data, and ERP Interfaces
- Suggested Exercise: Prioritize a Digital Twin or IIoT Use Case
- Suggested Exercise: Design a Pilot Charter and Benefits Measurement Plan
- Capstone Exercise: Present a Smart Factory Roadmap Pack

Practical Exercises

The course uses suggested activities based on a factory process, systems landscape, loss profile, data constraints, and investment choices.

- Suggested activity: assess maturity, identify capability gaps, and connect digital opportunities to quality, delivery, cost, safety, energy, and resilience outcomes.
- Suggested activity: map sensors, controls, operations systems, enterprise applications, data exchanges, owners, and cybersecurity boundaries.
- Suggested activity: compare IIoT, digital-twin, analytics, and automation use cases using value, feasibility, risk, readiness, and dependency criteria.
- Suggested activity: define a pilot with baseline, target, scope, architecture, data, security, workforce, governance, acceptance, and scale-up gates.

FAQs

Who suits smart manufacturing and Industry 4.0 training?

Smart manufacturing and Industry 4.0 training suits plant, production, engineering, automation, maintenance, quality, OT, IT, data, cybersecurity, and transformation personnel planning connected-factory improvements.

Does Industry 4.0 mean replacing every existing factory system?

No. A roadmap begins with business needs and the current systems landscape. It can retain, integrate, upgrade, isolate, or replace components according to value, risk, lifecycle, interoperability, and supportability.

How should a smart-manufacturing pilot be selected?

A suitable pilot addresses a meaningful operational problem, has accessible and trustworthy data, manageable integration and cyber risk, committed users, measurable baseline and target, defined ownership, and a plausible path to scale.

What makes a manufacturing digital twin trustworthy?

A trustworthy digital twin has a defined purpose and boundary, traceable source data, validated model behaviour, managed assumptions and uncertainty, controlled interfaces, cybersecurity protections, lifecycle ownership, and evidence that it supports its intended decision.

Conclusion

Participants leave with a Smart Factory Roadmap Pack for their organization. It combines a maturity assessment, current-state map, reference architecture, use-case portfolio, data and cybersecurity controls, pilot charter, benefit model, workforce plan, KPIs, governance, and scale-up gates. The pack turns Industry 4.0 ambition into sequenced and reviewable manufacturing decisions.