

Course No. 1508

Industry 4.0 & Smart Factory Technologies Training Course

INDUSTRIAL AUTOMATION & DIGITAL TECHNOLOGIES
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Industry 4.0 & Smart Factory Technologies Training Course provides a comprehensive and practical framework for understanding the technologies transforming modern manufacturing and industrial operations. The course focuses on how advanced automation, connected systems, industrial data, artificial intelligence, Industrial Internet of Things, and digital technologies can be integrated to improve productivity, quality, efficiency, operational resilience, and data-driven decision-making.

The program examines the core technologies and capabilities of Industry 4.0 and Smart Factory environments, including Industrial Internet of Things, artificial intelligence, industrial data analytics, edge computing, cloud computing, industrial robotics, digital twins, connected systems, and industrial cybersecurity. Participants will learn how these technologies interact and how they can be integrated into an operational environment that supports production objectives and delivers measurable business value.

A strong practical focus is placed on Smart Factory applications across production, maintenance, quality, asset management, energy, and supply chain operations. Participants will learn how to assess existing processes, identify opportunities for automation and digitalization, prioritize relevant use cases, and use industrial data to improve performance, identify potential problems earlier, strengthen predictive maintenance, and optimize equipment and process efficiency.

The course also addresses the strategic transition toward Smart Factory operations, including digital readiness assessment, technology prioritization, system integration, data management, industrial cybersecurity, change management, and digital transformation roadmaps. Through practical exercises and industrial case studies, participants will develop the ability to evaluate emerging technologies, identify high-value applications, and develop practical initiatives that support operational excellence, industrial resilience, sustainability, and long-term competitiveness.

Objectives

- Analyze the principles of Industry 4.0, its core technologies, and its impact on modern industrial operating models during the first day of the course.
- Evaluate the digital readiness of industrial facilities and identify technological, operational, and organizational gaps affecting Smart Factory transformation.

- Design an integrated Smart Factory architecture connecting industrial equipment, systems, data, digital platforms, and operational applications.
- Apply Industrial Internet of Things and industrial data technologies to improve operational monitoring, productivity, and equipment performance.
- Evaluate artificial intelligence and industrial data analytics applications for predictive maintenance, production optimization, quality improvement, and asset management.
- Apply advanced automation and industrial robotics principles to improve manufacturing processes and reduce unnecessary manual intervention.
- Evaluate the role of digital twins, edge computing, and cloud technologies in industrial simulation, monitoring, optimization, and decision-making.
- Analyze cybersecurity risks associated with connected factories and identify appropriate controls for protecting industrial systems and data.
- Develop practical priorities for industrial digital transformation initiatives based on operational value, feasibility, scalability, and organizational readiness.
- Prepare an integrated roadmap for implementing Industry 4.0 and Smart Factory technologies aligned with organizational objectives and performance indicators.

Who Should Attend

The Industry 4.0 & Smart Factory Technologies Training Course is designed for engineers and professionals working in industrial operations, engineering, automation, control systems, maintenance, asset management, information technology, operational technology, digital transformation, and data analytics. It is particularly relevant to production engineers, manufacturing engineers, automation engineers, instrumentation and control specialists, maintenance and reliability engineers, industrial systems specialists, data analysts, and digital transformation professionals.

The course is also suitable for plant managers, operations managers, engineering managers, maintenance managers, quality managers, supply chain managers, asset management professionals, IT and OT managers, digital transformation leaders, and industrial project managers. It is highly relevant to executives and decision makers in government entities, ministries, public-sector organizations, oil and gas companies, energy organizations, utilities, manufacturing companies, industrial facilities, and large corporations seeking to improve productivity, efficiency, quality, asset reliability, operational resilience, and digital capabilities through Industry 4.0 technologies.

Learning Outcomes

- Explain the principles of Industry 4.0 and the transformation taking place across modern manufacturing and industrial operations.
- Identify major Smart Factory technologies and evaluate their suitability for specific operational and organizational requirements.
- Assess industrial digital readiness and identify priority gaps and opportunities for digital transformation.
- Design a preliminary Smart Factory architecture connecting equipment, industrial systems, data, and digital applications.
- Apply Industrial Internet of Things technologies to collect and use operational data for improved monitoring and performance.
- Apply industrial data analytics and artificial intelligence concepts to support predictive maintenance, production optimization, and quality improvement.
- Evaluate the application of industrial robotics and advanced automation technologies to improve manufacturing processes.
- Explain the role of digital twins, edge computing, and cloud platforms in Smart Factory environments.
- Identify industrial cybersecurity risks and evaluate protection requirements for connected equipment and systems.
- Develop a practical Smart Factory transformation roadmap covering priorities, use cases, technologies, risks, governance, and performance indicators.

Course Outline

DAY 01

Industry 4.0 Foundations and Smart Factory Concepts

- Introduction to Industry 4.0 and the evolution of Smart Manufacturing
- Characteristics and key components of Smart Factories
- Traditional manufacturing versus digitally connected manufacturing
- Advanced industrial automation and connected systems
- Industrial Internet of Things and its role in Smart Factories
- Industrial data and digital analytics

DAY 01 — CONTINUED

- Artificial intelligence applications in manufacturing
- Edge computing and cloud computing
- Organizational and technological challenges of industrial transformation

PRACTICAL APPLICATION

Assessing an industrial environment and identifying opportunities to transition from traditional operations to Smart Factory capabilities

DAY 02

Digital Technologies and Smart Factory Infrastructure

- Smart Factory architecture and technology layers
- Industrial sensors, equipment, machines, and connected assets
- Industrial communication networks
- Industrial data collection and management
- Integration of Information Technology and Operational Technology
- Edge computing and real-time data processing
- Cloud platforms and industrial applications
- System interoperability and integration
- Digital dashboards and operational monitoring

PRACTICAL APPLICATION

Designing a Smart Factory technology architecture and connecting industrial systems, equipment, and data

DAY 03

Automation, Artificial Intelligence and Industrial Data Analytics

- Advanced automation and industrial robotics
- Robotic systems in manufacturing
- Artificial intelligence and machine learning in industrial operations
- Operational data analysis and pattern identification

DAY 03 — CONTINUED

- Predictive maintenance and equipment condition monitoring
- Production optimization using industrial data and analytics
- Quality improvement and early detection of process deviations
- Digital asset performance management
- Energy monitoring and operational efficiency improvement

PRACTICAL APPLICATION

Developing an artificial intelligence and industrial analytics use case to improve the performance of a selected manufacturing process

DAY 04

Digital Twins, Industrial Cybersecurity and Operational Resilience

- Digital twin concepts and industrial applications
- Digital simulation and process optimization
- Digital twins for asset management, maintenance, and production
- Cybersecurity in Smart Factory environments
- Protection of connected industrial equipment, systems, and networks
- Identity, access management, and data protection
- Cybersecurity risk assessment for industrial systems
- Business continuity and operational resilience
- Supplier and third-party risk management

PRACTICAL APPLICATION

Assessing digital and cybersecurity risks within a Smart Factory and identifying appropriate controls

DAY 05

Smart Factory Transformation Strategy and Implementation

- Assessing readiness for industrial digital transformation
- Identifying and prioritizing Smart Factory use cases
- Evaluating the operational and strategic value of emerging technologies
- Developing a Smart Factory transformation strategy
- Planning industrial digital transformation projects
- Integration and scalability requirements
- Governance, change management, and digital skills
- Performance indicators and transformation benefits measurement
- Developing a Smart Factory transformation roadmap

FINAL WORKSHOP

Designing an integrated Smart Factory strategy and implementation roadmap for a selected industrial environment

Register or Request More Information

Course page: <https://quest-training.com/courses/industry-40-smart-factory-technologies-training-course>

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