

Course No. 1271

AI in Manufacturing Training Course

AI FOR INDUSTRY
ARTIFICIAL INTELLIGENCE & APPLICATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The AI in Manufacturing Training Course is an advanced professional program designed to equip executives, managers, engineers, operations professionals, maintenance specialists, quality professionals, data specialists, and technology leaders with the knowledge and practical capabilities required to apply Artificial Intelligence across modern manufacturing environments. As industrial organizations accelerate smart manufacturing, digital transformation, automation, and data-driven operations, AI has become an important capability for improving productivity, product quality, equipment reliability, resource utilization, and operational decision-making.

The course explores practical applications of Artificial Intelligence, Machine Learning, Predictive Analytics, Computer Vision, Generative AI, Industrial Internet of Things, and intelligent automation across manufacturing operations. Participants will examine how these technologies can support predictive maintenance, equipment failure prediction, quality inspection, defect detection, production optimization, production forecasting, energy management, inventory planning, supply chain performance, and industrial asset management.

A central focus of the program is transforming industrial data into actionable operational intelligence. Participants will learn how to work with equipment data, sensor data, production-line data, control systems, enterprise systems, and operational platforms to evaluate data quality, identify patterns, detect anomalies, and develop AI use cases that support production, operations, maintenance, quality, and safety. The course also examines the relationship between AI, Industrial IoT, smart factories, digital twins, edge computing, and industrial control environments.

The course also addresses the organizational and technical considerations involved in implementing AI across industrial facilities, including data governance, industrial cybersecurity, AI risk management, integration with existing systems, human oversight, digital readiness, and change management. Through practical workshops, manufacturing case studies, and implementation exercises, participants will learn how to prioritize AI initiatives and align them with production, quality, maintenance, safety, operational efficiency, sustainability, and digital transformation objectives.

Objectives

- Analyze manufacturing processes to identify high-value opportunities for Artificial Intelligence implementation.
- Develop a comprehensive understanding of Artificial Intelligence, Machine Learning, and Predictive Analytics applications in industrial environments.
- Evaluate equipment, sensor, production-line, and operational data for AI-supported industrial analytics.
- Apply Predictive Analytics to maintenance planning, failure prediction, equipment reliability, and unplanned downtime reduction.
- Design AI-enabled approaches for product quality improvement and industrial defect detection.
- Improve productivity and process performance through intelligent analytics and AI-enabled optimization.
- Evaluate AI applications for energy consumption, resource utilization, and industrial sustainability.
- Strengthen the use of Computer Vision and Industrial IoT for process, equipment, and quality monitoring.
- Apply data governance, industrial cybersecurity, AI governance, and AI risk management principles.
- Assess the technological and organizational readiness required to implement AI across manufacturing facilities.
- Align AI initiatives with production, quality, maintenance, safety, operational efficiency, and digital transformation objectives.
- Develop a practical AI implementation roadmap for a defined manufacturing environment with measurable priorities and performance indicators.

Who Should Attend

The AI in Manufacturing Training Course is designed for executives, plant managers, production managers, operations managers, maintenance managers, engineering managers, quality managers, digital transformation managers, IT managers, automation and control managers, manufacturing engineers, mechanical engineers, electrical engineers, control and instrumentation engineers, maintenance and reliability engineers, data specialists, AI professionals, and industrial analytics specialists.

The course is particularly relevant for professionals working in manufacturing plants, industrial facilities, engineering environments, energy, automotive, petrochemical, pharmaceutical, food and beverage, consumer products, industrial equipment, and other sectors that depend on production lines, industrial equipment, and operational technology. It is also suitable for professionals working with Industrial Control Systems, SCADA, PLC, DCS, Industrial IoT, asset management, maintenance, quality, production planning, and continuous improvement.

The program is also valuable for decision-makers, innovation leaders, digital transformation professionals, enterprise architects, industrial project managers, continuous improvement specialists, reliability professionals, asset management specialists, and occupational safety leaders who need to understand how AI can be integrated with existing industrial systems and translated into scalable initiatives that improve operational performance and industrial competitiveness.

Learning Outcomes

- By the end of the AI in Manufacturing Training Course, participants will be able to:
- Explain the strategic role of Artificial Intelligence in smart factories and modern manufacturing.
- Identify and prioritize AI use cases across production, maintenance, quality, engineering, and operations.
- Analyze industrial and sensor data to identify patterns, bottlenecks, anomalies, and operational opportunities.
- Apply Predictive Analytics concepts to maintenance, failure prediction, and equipment reliability.
- Design Computer Vision approaches for industrial inspection and product quality monitoring.
- Evaluate AI applications for improving productivity, reducing waste, and optimizing production-line performance.
- Assess the role of Industrial IoT in connecting operational data with AI and industrial analytics solutions.
- Evaluate AI opportunities for energy optimization, resource management, and industrial sustainability.
- Analyze integration requirements between AI solutions, operational technology, control systems, and enterprise platforms.
- Apply data governance, industrial cybersecurity, and responsible AI principles within manufacturing environments.
- Assess organizational and technological readiness for manufacturing AI initiatives.

- Develop an AI implementation roadmap aligned with production, quality, maintenance, efficiency, safety, and digital transformation KPIs.

Course Outline

DAY 01

Foundations of AI in Manufacturing

- Artificial Intelligence and its role in the future of manufacturing and smart factories
- Fundamentals of AI, Machine Learning, Predictive Analytics, and Generative AI
- Industrial data ecosystems and manufacturing data sources
- The relationship between AI, Industrial IoT, automation, and industrial control systems

PRACTICAL APPLICATION

Assessing digital readiness and identifying AI opportunities within a manufacturing facility

DAY 02

AI for Production and Process Optimization

- AI-powered production performance analysis
- Production forecasting, demand analysis, and intelligent operations planning
- Process optimization and bottleneck reduction using advanced analytics
- AI for resource utilization and energy efficiency in industrial operations

PRACTICAL APPLICATION

Designing an AI use case for improving a production line or industrial process

DAY 03

AI for Maintenance, Quality, and Reliability

- Predictive maintenance and equipment sensor data analysis
- Failure detection and anomaly detection using Machine Learning
- Computer Vision for industrial inspection and product quality control

DAY 03 — CONTINUED

- AI for asset management, reliability improvement, and unplanned downtime reduction

PRACTICAL APPLICATION

Developing an AI-enabled solution for predictive maintenance or automated quality inspection

DAY 04

Industrial Data, Cybersecurity, and Intelligent Integration

- Industrial data management, data quality, and AI-ready data strategies
- Integration of AI with PLC, SCADA, DCS, MES, and ERP environments
- Industrial IoT, edge computing, and digital twins
- Industrial cybersecurity, AI governance, risk management, privacy, and responsible AI

PRACTICAL APPLICATION

Designing an integrated data and AI governance framework for an industrial environment

DAY 05

AI Strategy and Implementation in Manufacturing

- Developing an enterprise AI strategy for manufacturing organizations
- Prioritizing AI use cases according to operational value, feasibility, risk, and cost
- Measuring AI impact through production, quality, maintenance, efficiency, energy, and safety KPIs
- Future trends in smart factories, intelligent manufacturing, digital twins, advanced automation, and Generative AI

FINAL WORKSHOP

Developing a comprehensive AI implementation roadmap for a manufacturing facility, including prioritized use cases, data requirements, technology architecture and integration considerations, AI governance, industrial cybersecurity, implementation phases, change management, stakeholder engagement, performance indicators, risk management, and an action plan to improve productivity, quality, maintenance, reliability, energy efficiency, safety, and digital transformation.



Register or Request More Information

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