Intelligent Automation Systems in Manufacturing Training Course

Professional Development Training Course Outline

Category	Manufacturing	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Intelligent Automation Systems in Manufacturing Training Course is designed to equip professionals with the skills required to transform traditional manufacturing environments into smart factories powered by Industry 4.0 technologies. This course focuses on the integration of Industrial IoT (IIoT), AI-driven automation, robotics, machine learning, digital twins, and advanced data analytics to optimize production efficiency, reduce operational costs, and enhance predictive decision-making capabilities. Participants will gain hands-on exposure to modern automation frameworks that are reshaping global manufacturing competitiveness.

In today’s rapidly evolving industrial landscape, organizations are adopting smart manufacturing, cyber-physical systems, edge computing, and cloud-based automation platforms to remain competitive. This training bridges the gap between theoretical knowledge and real-world industrial applications by enabling learners to design, deploy, and manage end-to-end intelligent automation ecosystems. It empowers engineers, technicians, and managers to lead digital transformation initiatives and implement scalable automation strategies aligned with Industry 4.0 and Industry 5.0 trends.

Programme Curriculum

Intelligent Automation Systems in Manufacturing Training Course

Introduction

Intelligent Automation Systems in Manufacturing Training Course is designed to equip professionals with the skills required to transform traditional manufacturing environments into smart factories powered by Industry 4.0 technologies. This course focuses on the integration of Industrial IoT (IIoT), AI-driven automation, robotics, machine learning, digital twins, and advanced data analytics to optimize production efficiency, reduce operational costs, and enhance predictive decision-making capabilities. Participants will gain hands-on

exposure to modern automation frameworks that are reshaping global manufacturing competitiveness.

In today's rapidly evolving industrial landscape, organizations are adopting smart manufacturing, cyber-physical systems, edge computing, and cloud-based automation platforms to remain competitive. This training bridges the gap between theoretical knowledge and real-world industrial applications by enabling learners to design, deploy, and manage end-to-end intelligent automation ecosystems. It empowers engineers, technicians, and managers to lead digital transformation initiatives and implement scalable automation strategies aligned with Industry 4.0 and Industry 5.0 trends.

Course Duration

5 days

Course Objectives

1. Master Industrial IoT (IIoT) architecture for smart manufacturing
2. Implement AI-powered predictive maintenance systems
3. Design robotic process automation (RPA) workflows in production lines
4. Apply machine learning for manufacturing optimization
5. Integrate digital twin technology in factory operations
6. Develop smart sensors and real-time monitoring systems
7. Optimize production using big data analytics and edge computing
8. Enhance quality control through computer vision systems
9. Implement cyber-physical production systems (CPPS)
10. Understand cloud-based manufacturing execution systems (MES)
11. Improve efficiency using autonomous robotics and cobots
12. Strengthen cybersecurity in industrial automation systems
13. Drive end-to-end digital transformation in manufacturing

Target Audience

- Manufacturing Engineers
- Automation and Control Engineers
- Industrial IoT Developers
- Plant Managers and Production Supervisors
- Mechanical and Electrical Engineers
- Data Analysts in Manufacturing Sector
- Robotics Technicians and Maintenance Engineers
- Digital Transformation Consultants

Course Modules

Module 1: Foundations of Smart Manufacturing Systems

- Industry 4.0 & Industry 5.0 evolution
- Smart factory architecture overview
- Automation vs intelligent automation
- Key enabling technologies
- Industrial digital transformation roadmap
- **Case Study:** Toyota Smart Factory implementation of lean + automation systems

Module 2: Industrial IoT (IIoT) and Connected Devices

- IIoT ecosystem design
- Sensor networks and edge devices
- Real-time data acquisition systems
- Protocols (MQTT, OPC-UA)
- Device integration in production lines
- **Case Study:** Siemens IIoT-enabled production monitoring system

Module 3: Artificial Intelligence in Manufacturing

- AI algorithms in production optimization
- Predictive analytics for machine failure
- Anomaly detection systems
- AI-driven decision-making models
- Machine learning pipelines
- **Case Study:** General Electric predictive maintenance in jet engine manufacturing

Module 4: Robotics and Automation Systems

- Industrial robots and cobots
- Robotic arm programming
- Automated assembly systems
- Motion control systems
- Human-robot collaboration
- **Case Study:** Tesla automated assembly line robotics integration

Module 5: Digital Twin Technology

- Concept of digital replication
- Real-time simulation systems
- Virtual factory modeling
- Performance optimization using twins
- Lifecycle management integration
- **Case Study:** Airbus digital twin aircraft production system

Module 6: Data Analytics & Edge Computing

- Big data in manufacturing systems
- Edge vs cloud computing
- Real-time analytics dashboards
- KPI monitoring systems
- Data-driven production optimization
- **Case Study:** Bosch smart factory analytics platform

Module 7: Cybersecurity in Industrial Automation

- Industrial control system security
- Threat detection in OT environments
- Secure communication protocols
- Risk management frameworks
- Cyber resilience strategies
- **Case Study:** Stuxnet-inspired industrial cybersecurity reinforcement model

Module 8: Smart Factory Integration & MES Systems

- Manufacturing Execution Systems (MES)
- ERP integration with automation systems
- Workflow orchestration
- Production scheduling automation
- End-to-end system integration
- **Case Study:** Amazon smart warehouse automation ecosystem

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com