Industrial Internet of Things (IIoT) 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

The Industrial Internet of Things in Manufacturing Training Course is designed to equip professionals with cutting-edge skills in smart manufacturing, Industry 4.0 transformation, predictive analytics, and connected industrial systems. As global industries rapidly shift toward automation and data-driven operations, IIoT has become a core enabler of intelligent factories, real-time monitoring, and operational efficiency optimization.

This course provides a deep dive into sensor integration, industrial connectivity protocols, edge and cloud computing, AI-powered predictive maintenance, and digital twin technologies. Participants will learn how to design, implement, and manage scalable IIoT ecosystems that enhance productivity, reduce downtime, improve asset utilization, and strengthen cyber-physical production systems (CPPS) in modern manufacturing environments.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Understand Industry 4.0 architecture and IIoT ecosystem frameworks
2. Implement smart sensors and industrial data acquisition systems
3. Master PLC, SCADA, and OPC UA integration in manufacturing systems
4. Apply MQTT and industrial communication protocols for real-time data flow
5. Develop skills in edge computing and fog computing for low-latency processing
6. Enable predictive maintenance using AI and machine learning models
7. Build and manage cloud-based IIoT platforms (AWS IoT, Azure IoT)
8. Design digital twin models for production simulation and optimization
9. Strengthen knowledge of OT/IT convergence in smart factories
10. Implement industrial cybersecurity and IIoT risk mitigation strategies
11. Optimize production using real-time analytics and big data in manufacturing
12. Deploy automation systems for smart factory transformation
13. Enhance decision-making through data-driven manufacturing intelligence

Target Audience

1. Manufacturing Engineers
2. Automation & Control Engineers
3. Industrial IoT Developers
4. Plant Managers & Operations Managers
5. Data Analysts in Manufacturing
6. Maintenance & Reliability Engineers
7. IT/OT Integration Specialists
8. Engineering Students & Research Professionals

Course Modules

Module 1: Introduction to IIoT & Smart Manufacturing

- Industry 4.0 evolution and smart factory concepts
- IIoT architecture layers and ecosystem components
- Cyber-Physical Systems (CPS) in manufacturing
- Industrial transformation from automation to autonomy
- Real-time data-driven production systems
- **Case Study:** A automotive plant reduces downtime by 35% using IIoT-based monitoring of assembly lines.

Module 2: Industrial Sensors & Data Acquisition Systems

- Types of industrial IoT sensors (temperature, vibration, pressure)
- PLC integration with sensor networks
- SCADA systems for industrial monitoring
- Data acquisition and signal processing techniques
- OPC UA for interoperability

- **Case Study:** A food processing factory improves quality control using real-time sensor-based temperature monitoring.

Module 3: Industrial Connectivity & Communication Protocols

- MQTT, CoAP, and AMQP protocols in IIoT
- Industrial Ethernet and wireless communication systems
- 5G applications in smart manufacturing
- Edge device connectivity setup
- Secure machine-to-machine (M2M) communication
- **Case Study:** A textile industry improves production speed by 40% using 5G-enabled IoT machines.

Module 4: Edge Computing & Real-Time Data Processing

- Edge vs cloud computing in manufacturing
- Fog computing architecture
- Low-latency industrial data processing
- Edge AI for real-time decision-making
- Data filtering and preprocessing at the edge
- **Case Study:** A steel plant reduces defects using edge-based real-time quality inspection systems.

Module 5: AI, Machine Learning & Predictive Maintenance

- Predictive maintenance models in manufacturing
- Machine learning for failure prediction
- Anomaly detection in equipment behavior
- AI-driven production optimization
- Data labeling and model training for industrial use
- **Case Study:** A cement factory reduces equipment failure by 50% using AI-based predictive maintenance.

Module 6: Cloud Platforms & IIoT Data Management

- AWS IoT, Microsoft Azure IoT architecture
- Cloud storage and big data pipelines
- Real-time dashboards and visualization tools
- Data lakes in industrial environments
- Scalable cloud-based analytics
- **Case Study:** A electronics manufacturer improves global operations visibility using Azure IoT dashboards.

Module 7: Digital Twin Technology in Manufacturing

- Concept of digital twins in Industry 4.0
- Simulation of production lines
- Virtual commissioning of machines
- Real-time synchronization with physical assets
- Optimization through predictive simulation
- **Case Study:** A aerospace company reduces design errors by 30% using digital twin simulation.

Module 8: IIoT Security & Smart Factory Implementation

- Industrial cybersecurity threats and vulnerabilities
- OT/IT convergence security frameworks
- Secure device authentication and encryption
- Risk management in IIoT environments
- End-to-end smart factory deployment strategy
- **Case Study:** A power plant prevents cyber intrusion using layered IIoT security architecture.

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:

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