IoT Sensor Integration 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

IoT Sensor Integration in Manufacturing Training Course is designed to equip learners with the skills required to implement, manage, and optimize Industrial Internet of Things (IIoT) solutions across modern manufacturing environments. As Industry 4.0 continues to reshape global production systems, the integration of smart sensors, real-time data analytics, edge computing, and machine-to-machine communication has become essential for operational efficiency, predictive maintenance, and intelligent automation. This course provides a deep dive into how IoT-enabled manufacturing systems transform traditional factories into smart, connected ecosystems.

With a strong focus on real-world industrial applications, participants will explore how sensor networks, cloud platforms, and AI-driven analytics improve productivity, reduce downtime, and enhance decision-making. The training emphasizes smart factory architecture, wireless sensor networks, industrial protocols (MQTT, OPC UA), cybersecurity in IoT systems, and digital twin technology. By the end of the program, learners will be capable of designing and deploying scalable IoT sensor solutions tailored for modern manufacturing challenges.

Programme Curriculum

IoT Sensor Integration in Manufacturing Training Course

Introduction

IoT Sensor Integration in Manufacturing Training Course is designed to equip learners with the skills required to implement, manage, and optimize Industrial Internet of Things (IIoT) solutions across modern manufacturing environments. As Industry 4.0 continues to reshape global production systems, the integration of smart sensors, real-time data analytics, edge computing, and machine-to-machine communication has become essential for operational efficiency, predictive maintenance, and intelligent automation. This course provides a

deep dive into how IoT-enabled manufacturing systems transform traditional factories into smart, connected ecosystems.

With a strong focus on real-world industrial applications, participants will explore how sensor networks, cloud platforms, and AI-driven analytics improve productivity, reduce downtime, and enhance decision-making. The training emphasizes smart factory architecture, wireless sensor networks, industrial protocols (MQTT, OPC UA), cybersecurity in IoT systems, and digital twin technology. By the end of the program, learners will be capable of designing and deploying scalable IoT sensor solutions tailored for modern manufacturing challenges.

Course Duration

5 days

Course Objectives

1. Understand fundamentals of Industrial IoT (IIoT) architecture
2. Deploy and configure smart sensors in manufacturing environments
3. Integrate wireless sensor networks (WSN) for real-time monitoring
4. Implement predictive maintenance systems using IoT data
5. Master industrial communication protocols (MQTT, OPC UA, Modbus)
6. Design edge computing solutions for low-latency processing
7. Apply cloud IoT platforms for data storage and analytics
8. Develop real-time dashboards for production monitoring
9. Enhance cybersecurity in IoT-enabled factories
10. Enable machine-to-machine (M2M) communication systems
11. Utilize AI and machine learning for sensor data analytics
12. Build digital twin models for manufacturing optimization
13. Optimize smart factory operations using IoT-driven insights

Target Audience

1. Manufacturing Engineers
2. Automation Engineers
3. IoT Developers & System Integrators
4. Industrial IT Specialists
5. Maintenance & Reliability Engineers
6. Data Analysts in Manufacturing
7. Technical Project Managers
8. Engineering Students (Electronics, Mechatronics, Computer Engineering)

Course Modules

Module 1: Introduction to Industrial IoT & Smart Manufacturing

- Overview of Industry 4.0 transformation
- IoT ecosystem in manufacturing
- Smart factory components
- Role of sensors and actuators
- Case Study: Digital transformation of an automotive plant

Module 2: IoT Sensor Technologies & Deployment

- Types of industrial sensors (temperature, vibration, pressure)
- Sensor calibration and accuracy
- Deployment strategies in factories
- Data acquisition systems
- Case Study: Sensor deployment in a food processing plant

Module 3: Industrial Communication Protocols

- MQTT, OPC UA, Modbus overview
- Data transmission standards
- Protocol selection criteria
- Integration with PLC systems
- Case Study: Real-time machine monitoring system

Module 4: Wireless Sensor Networks (WSN)

- Architecture of WSN in industry
- Zigbee, LoRaWAN, and Bluetooth LE
- Network optimization techniques
- Power management in sensors
- Case Study: Smart warehouse tracking system

Module 5: Edge Computing in Manufacturing

- Edge vs cloud computing
- Real-time processing at edge devices
- Latency reduction techniques
- Edge AI applications
- Case Study: Predictive maintenance in CNC machines

Module 6: Cloud IoT Platforms & Data Analytics

- Cloud platforms (AWS IoT, Azure IoT, Google Cloud IoT)
- Data storage and visualization
- Big data analytics in manufacturing
- Dashboard creation
- Case Study: Cloud-based factory performance monitoring

Module 7: Cybersecurity in IoT Manufacturing Systems

- IoT security threats and vulnerabilities
- Encryption and authentication methods
- Network security protocols
- Risk mitigation strategies
- Case Study: Preventing cyberattacks in smart factories

Module 8: AI, Digital Twins & Predictive Maintenance

- AI integration in IoT systems
- Machine learning for anomaly detection
- Digital twin modeling
- Predictive maintenance frameworks

- Case Study: AI-driven failure prediction in production lines

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

Start Date	End Date	Location	Price
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