Industrial Systems 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

Industrial Systems Integration in Manufacturing is a critical discipline driving the future of Industry 4.0, smart factories, and digital transformation in production environments. This training course is designed to equip professionals with advanced competencies in integrating automation systems, industrial IoT (IIoT), SCADA, PLC networks, MES (Manufacturing Execution Systems), and ERP platforms to achieve seamless, data-driven manufacturing operations. As global manufacturing shifts toward intelligent, interconnected ecosystems, systems integration has become a cornerstone for improving operational efficiency, predictive maintenance, real-time analytics, and production optimization.

Industrial Systems Integration in Manufacturing Training Course provides a deep understanding of how modern manufacturing systems communicate, synchronize, and operate as unified digital infrastructures. Participants will explore real-world industrial architectures, cybersecurity in operational technology (OT), cloud-edge integration, and advanced data interoperability standards. By mastering these concepts, learners will be able to design and implement scalable, resilient, and future-ready manufacturing systems aligned with smart manufacturing, digital twin technology, and AI-driven production systems.

Programme Curriculum

Industrial Systems Integration in Manufacturing Training Course

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Course Duration

5 days

Course Objectives

1. Understand Industry 4.0 architecture and smart manufacturing ecosystems
2. Master PLC, SCADA, and HMI integration techniques
3. Apply Industrial IoT (IIoT) connectivity in manufacturing systems
4. Integrate MES (Manufacturing Execution Systems) with ERP platforms
5. Develop skills in real-time data acquisition and industrial analytics
6. Implement cybersecurity strategies for OT (Operational Technology) systems
7. Design interoperable industrial communication networks (OPC UA, MQTT)
8. Explore digital twin modeling for production optimization
9. Optimize workflows using automation and robotics integration
10. Enable predictive maintenance using AI and machine learning
11. Improve cloud-edge hybrid manufacturing architectures
12. Enhance decision-making with big data analytics in manufacturing
13. Build scalable systems aligned with smart factory transformation strategies

Target Audience

1. Manufacturing Engineers
2. Automation & Control Engineers
3. Industrial IT Specialists
4. Maintenance Engineers
5. System Integration Consultants
6. Production Managers
7. Electrical & Electronics Engineers
8. Technical Project Managers

Course Modules

Module 1: Foundations of Industrial Systems Integration

- Overview of Industry 4.0 and smart manufacturing
- Core components of integrated industrial systems
- Role of automation in modern production
- Introduction to OT vs IT convergence
- System integration lifecycle
- **Case Study:** Smart factory transformation in automotive manufacturing plant

Module 2: PLC, SCADA & HMI Integration

- PLC programming fundamentals and architecture
- SCADA system configuration and monitoring
- HMI interface design principles
- Real-time control system integration
- Fault detection and alarm systems
- **Case Study:** Automated bottling plant control system integration

Module 3: Industrial IoT (IIoT) & Connectivity

- IIoT device architecture and sensors
- Edge computing in manufacturing
- Machine-to-machine (M2M) communication
- Cloud-based industrial data systems
- IoT protocols (MQTT, OPC UA)
- **Case Study:** Predictive monitoring in smart textile manufacturing

Module 4: MES & ERP Integration

- Role of MES in production execution
- ERP system connectivity and synchronization
- Production tracking and scheduling systems
- Data flow between shop floor and enterprise systems
- Integration challenges and solutions
- **Case Study:** MES-ERP integration in pharmaceutical production line

Module 5: Industrial Communication Networks

- Industrial Ethernet and fieldbus systems
- OPC UA architecture and applications
- Network topology design for factories
- Data interoperability standards
- Latency and reliability optimization
- **Case Study:** High-speed packaging line communication upgrade

Module 6: Cybersecurity in Industrial Systems

- OT cybersecurity fundamentals
- Risk assessment and threat modeling
- Network segmentation strategies
- Secure device authentication
- Incident response in industrial environments
- **Case Study:** Cyberattack prevention in energy manufacturing plant

Module 7: Digital Twin & Advanced Analytics

- Concept of digital twin in manufacturing
- Simulation and modeling of production systems
- AI-driven predictive analytics
- Real-time performance optimization
- Data visualization dashboards

- **Case Study:** Digital twin implementation in aerospace assembly line

Module 8: Cloud, Edge & Future Manufacturing Systems

- Cloud computing in industrial systems
- Edge AI for real-time decision-making
- Hybrid cloud-edge architecture
- Scalable manufacturing systems design
- Future trends in smart factories
- **Case Study:** Cloud-edge integration in global electronics manufacturer

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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