Advanced Process Engineering in Manufacturing Training Course

Professional Development Training Course Outline

Category	Manufacturing	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Advanced Process Engineering in Manufacturing is a cutting-edge training program designed to equip engineers, production managers, and technical professionals with the skills required to optimize modern industrial systems. In today's competitive manufacturing landscape driven by Industry 4.0, smart factories, digital transformation, lean automation, AI-driven process control, and sustainable production systems, organizations demand highly efficient, data-driven, and resilient process engineering capabilities. Advanced Process Engineering in Manufacturing Training Course bridges the gap between traditional manufacturing practices and next-generation intelligent production systems, enabling professionals to design, analyze, and improve complex manufacturing processes with precision and innovation.

The training focuses on integrating advanced process optimization techniques, real-time data analytics, industrial IoT (IIoT), predictive maintenance, Six Sigma methodologies, lean manufacturing principles, and digital twin technology into manufacturing environments. Participants will gain hands-on exposure to simulation tools, process modeling frameworks, and optimization strategies that enhance productivity, reduce waste, improve quality, and ensure operational excellence. By the end of the course, learners will be capable of leading transformative initiatives in manufacturing systems that align with global standards of efficiency, sustainability, and technological advancement.

Programme Curriculum

Advanced Process Engineering in Manufacturing Training Course

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Course Duration

10 days

Course Objectives

1. Master Advanced Process Optimization Techniques
2. Apply Industry 4.0 Smart Manufacturing Systems
3. Implement Lean Manufacturing & Continuous Improvement
4. Utilize Industrial IoT (IIoT) for Process Monitoring
5. Develop Predictive Maintenance Strategies using AI
6. Enhance Production Efficiency through Data Analytics
7. Design Sustainable Manufacturing Processes
8. Integrate Digital Twin Technology in Operations
9. Apply Six Sigma & Statistical Process Control (SPC)
10. Improve Supply Chain & Production Synchronization
11. Optimize Energy Consumption in Manufacturing Systems
12. Strengthen Quality Assurance & Risk Management Systems
13. Enable Automation & Robotics Integration in Production Lines

Target Audience

1. Manufacturing Engineers
2. Process Engineers
3. Industrial Engineers
4. Production Managers
5. Quality Assurance Professionals
6. Maintenance Engineers
7. Operations Managers
8. Technical Consultants in Manufacturing Industries

Course Modules

Module 1: Fundamentals of Process Engineering

- Core principles of process design
- Manufacturing system lifecycle

- Material and energy balance basics
- Process flow diagram interpretation
- Industrial process classifications
- **Case Study:** Beverage manufacturing line optimization

Module 2: Industry 4.0 in Manufacturing

- Smart factory concepts
- Cyber-physical systems
- Digital transformation frameworks
- Automation integration models
- Connected manufacturing ecosystems
- **Case Study:** Smart automotive plant transformation

Module 3: Lean Manufacturing Systems

- Waste elimination techniques
- Value stream mapping
- Kaizen continuous improvement
- Just-in-time production
- Workflow optimization strategies
- **Case Study:** Lean implementation in electronics assembly

Module 4: Six Sigma & Quality Control

- DMAIC methodology
- Statistical process control tools
- Defect reduction strategies
- Process capability analysis
- Root cause analysis techniques
- **Case Study:** Defect reduction in textile manufacturing

Module 5: Industrial IoT (IIoT) Applications

- Sensor integration systems
- Real-time data acquisition
- Machine-to-machine communication
- Cloud-based manufacturing analytics
- Smart monitoring dashboards
- **Case Study:** IIoT in pharmaceutical production

Module 6: Predictive Maintenance Systems

- Condition monitoring techniques
- Machine learning predictive models
- Failure mode analysis
- Maintenance scheduling optimization
- Asset lifecycle management
- **Case Study:** Predictive maintenance in steel plant

Module 7: Process Simulation & Modeling

- Digital process simulation tools
- Scenario analysis techniques
- System dynamics modeling
- Flow simulation software usage
- Performance benchmarking models
- **Case Study:** Chemical plant process simulation

Module 8: Production Optimization Techniques

- Bottleneck analysis
- Throughput improvement methods
- Scheduling optimization
- Capacity planning strategies
- Resource allocation models
- **Case Study:** FMCG production optimization

Module 9: Automation & Robotics Integration

- Industrial robotics systems
- PLC programming basics
- Automated assembly systems
- Human-machine collaboration
- Robotics safety systems
- **Case Study:** Automotive robotic welding line

Module 10: Energy Efficiency in Manufacturing

- Energy audit techniques
- Carbon footprint reduction
- Sustainable energy integration
- Waste heat recovery systems
- Green manufacturing practices
- **Case Study:** Energy optimization in cement industry

Module 11: Supply Chain Process Engineering

- End-to-end supply chain mapping
- Inventory optimization
- Demand forecasting models
- Logistics process integration
- Supplier relationship management
- **Case Study:** Global electronics supply chain redesign

Module 12: Data Analytics in Manufacturing

- Big data processing techniques
- Manufacturing KPIs and dashboards
- Machine learning applications
- Real-time analytics systems
- Decision support systems
- **Case Study:** Data-driven production improvement in FMCG

Module 13: Risk Management in Processes

- Operational risk identification
- Failure mode and effects analysis (FMEA)
- Safety compliance systems
- Process hazard analysis
- Mitigation planning strategies
- **Case Study:** Risk control in chemical processing plant

Module 14: Digital Twin Technology

- Virtual process replication
- Real-time simulation systems
- Predictive system modeling
- Performance optimization tools
- Lifecycle digital modeling
- **Case Study:** Digital twin in aerospace manufacturing

Module 15: Advanced Process Innovation

- Innovation management strategies
- Emerging manufacturing technologies
- R&D integration in production
- Smart materials usage
- Future manufacturing trends
- **Case Study:** Advanced nanotechnology manufacturing system

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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

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