Equipment Performance Optimization 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

Equipment Performance Optimization in Manufacturing is a critical capability in the era of Industry 4.0, smart manufacturing, and digital transformation. Equipment Performance Optimization in Manufacturing Training Course is designed to equip professionals with advanced skills to improve Overall Equipment Effectiveness (OEE), reduce downtime, enhance asset reliability, and implement predictive maintenance strategies using modern tools such as Industrial IoT (IIoT), AI-driven analytics, and real-time condition monitoring systems. Participants will gain practical insights into optimizing production assets for maximum efficiency and cost reduction.

In today’s competitive manufacturing landscape, organizations are increasingly relying on data-driven decision-making, lean manufacturing principles, and automation technologies to achieve operational excellence. This course bridges the gap between traditional maintenance practices and modern predictive and prescriptive maintenance frameworks, enabling participants to transform equipment performance, improve productivity, and achieve sustainable manufacturing excellence.

Programme Curriculum

Equipment Performance Optimization in Manufacturing Training Course

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Course Objectives

1. Understand principles of Equipment Performance Optimization
2. Improve Overall Equipment Effectiveness (OEE)
3. Apply Predictive Maintenance strategies using AI & IIoT
4. Reduce unplanned downtime and production losses
5. Implement Condition-Based Monitoring (CBM) systems
6. Enhance asset reliability and lifecycle management
7. Optimize manufacturing throughput and cycle time
8. Integrate Lean Manufacturing and Six Sigma tools
9. Analyze equipment failure patterns using data analytics
10. Develop preventive maintenance optimization plans
11. Utilize digital twin technology for equipment simulation
12. Improve energy efficiency in manufacturing systems
13. Align equipment performance with smart factory transformation goals

Target Audience

- Maintenance Engineers & Technicians
- Production Supervisors & Managers
- Reliability Engineers
- Industrial Engineers
- Plant Managers & Operations Leaders
- Manufacturing Consultants
- Quality Assurance Professionals
- Automation & Control Engineers

Course Modules

Module 1: Fundamentals of Equipment Performance Optimization

- OEE components: Availability, Performance, Quality
- Key performance indicators (KPIs) in manufacturing
- Types of equipment losses (Six Big Losses)
- Introduction to smart manufacturing systems
- Equipment lifecycle performance analysis
- **Case Study:** Improving OEE in an automotive assembly line through loss reduction strategies.

Module 2: Predictive Maintenance & Condition Monitoring

- Predictive vs preventive maintenance
- Vibration, thermal, and oil analysis techniques
- Sensor integration for real-time monitoring
- Failure prediction models using AI
- Maintenance scheduling optimization
- **Case Study:** Reducing bearing failure in a cement plant using vibration analytics.

Module 3: Industrial IoT (IIoT) in Manufacturing

- IIoT architecture and connectivity
- Smart sensors and edge computing
- Real-time data acquisition systems
- Cloud-based manufacturing analytics
- Machine-to-machine communication
- **Case Study:** Implementing IIoT in a packaging plant for real-time performance tracking.

Module 4: Data Analytics for Equipment Optimization

- Descriptive, predictive, and prescriptive analytics
- Data visualization dashboards
- Root cause analysis techniques
- Machine learning in failure prediction
- KPI tracking systems
- **Case Study:** Using analytics to reduce downtime in a food processing plant.

Module 5: Lean Manufacturing & Waste Reduction

- Lean principles in equipment optimization
- Eliminating the 7 wastes (TIMWOOD)
- Value stream mapping
- Kaizen and continuous improvement
- Standardized work processes
- **Case Study:** Lean transformation in a textile manufacturing unit.

Module 6: Reliability Engineering & Asset Management

- Reliability-centered maintenance (RCM)
- Mean Time Between Failures (MTBF)
- Failure Mode and Effects Analysis (FMEA)
- Asset criticality assessment
- Spare parts optimization
- **Case Study:** Reliability improvement in a power generation facility.

Module 7: Automation & Smart Factory Integration

- PLC, SCADA, and MES systems
- Robotics in manufacturing optimization
- Digital twin applications
- Smart factory architecture
- Cyber-physical systems integration
- **Case Study:** Smart factory implementation in an electronics manufacturing plant.

Module 8: Energy Efficiency & Sustainable Manufacturing

- Energy consumption analysis
- Green manufacturing practices
- Carbon footprint reduction strategies
- Equipment energy optimization
- Sustainable maintenance planning
- **Case Study:** Energy optimization in a steel manufacturing plant.

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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