Maintenance Strategy Optimization 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

Maintenance Strategy Optimization in Manufacturing is a high-impact, performance-driven discipline designed to transform traditional maintenance operations into data-driven, predictive, and reliability-centered systems. In today’s competitive Industry 4.0 environment, organizations are increasingly adopting predictive maintenance (PdM), condition-based monitoring (CBM), Total Productive Maintenance (TPM), Industrial IoT (IIoT), and AI-driven asset management to reduce downtime, improve OEE (Overall Equipment Effectiveness), and extend asset lifecycle.

Maintenance Strategy Optimization in Manufacturing Training Course provides a comprehensive, hands-on learning journey into advanced maintenance engineering strategies that align with smart manufacturing, lean operations, and digital transformation goals. Participants will gain deep expertise in reliability engineering, failure mode analysis (FMEA), root cause analysis (RCA), asset performance optimization, and maintenance cost reduction strategies, enabling them to build resilient and efficient manufacturing systems that maximize productivity and minimize operational risk.

Programme Curriculum

Maintenance Strategy Optimization in Manufacturing Training Course

Introduction

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Course Objectives

1. Understand Maintenance Strategy Optimization frameworks in modern manufacturing systems
2. Apply Predictive Maintenance (PdM) and Condition-Based Monitoring (CBM) techniques
3. Implement Total Productive Maintenance (TPM) for operational excellence
4. Analyze equipment failures using Root Cause Analysis (RCA)
5. Develop Failure Mode and Effects Analysis (FMEA) models
6. Improve Overall Equipment Effectiveness (OEE) through data-driven maintenance
7. Integrate Industrial IoT (IIoT) for smart asset monitoring
8. Optimize maintenance cost using life-cycle asset management strategies
9. Build Reliability-Centered Maintenance (RCM) programs
10. Enhance downtime reduction using lean maintenance practices
11. Utilize AI and Machine Learning in predictive maintenance systems
12. Strengthen spare parts and inventory optimization strategies
13. Design scalable digital maintenance transformation roadmaps

Target Audience

- Maintenance Engineers and Supervisors
- Plant Managers and Operations Managers
- Reliability Engineers and Asset Managers
- Industrial Engineers and Production Engineers
- Manufacturing Consultants and Analysts
- Automation and Control Engineers
- Technical Maintenance Technicians
- Engineering Students specializing in Manufacturing Systems

Course Modules

Module 1: Fundamentals of Maintenance Strategy

- Evolution of maintenance models (reactive to predictive)
- Maintenance KPIs and performance metrics
- Types of maintenance strategies in industry
- Cost vs reliability trade-offs
- Case Study: Transition from reactive to preventive maintenance in an automotive plant

Module 2: Reliability-Centered Maintenance (RCM)

- Principles of RCM methodology
- Critical asset identification techniques

- Functional failure analysis
- Maintenance task optimization
- Case Study: RCM implementation in power generation equipment

Module 3: Predictive Maintenance (PdM)

- Vibration analysis fundamentals
- Thermal imaging and infrared diagnostics
- Sensor-based monitoring systems
- Data interpretation techniques
- Case Study: Predictive maintenance in CNC machining operations

Module 4: Condition-Based Monitoring (CBM)

- Real-time condition monitoring systems
- Threshold setting for equipment health
- Sensor integration techniques
- Alarm and alert system design
- Case Study: CBM deployment in a chemical processing plant

Module 5: Total Productive Maintenance (TPM)

- TPM pillars and framework
- Autonomous maintenance practices
- Operator involvement strategies
- Planned maintenance scheduling
- Case Study: TPM implementation in FMCG manufacturing

Module 6: Root Cause Analysis (RCA)

- 5 Why technique and fishbone diagram
- Failure investigation process
- Data collection and validation
- Corrective action planning
- Case Study: RCA in assembly line breakdown reduction

Module 7: Failure Mode and Effects Analysis (FMEA)

- Risk priority number (RPN) calculation
- Failure classification techniques
- Preventive control measures
- Design vs process FMEA
- Case Study: FMEA in automotive braking system production

Module 8: Industrial IoT in Maintenance

- Smart sensors and connected assets
- Edge computing in manufacturing
- Cloud-based monitoring systems
- Real-time data analytics
- Case Study: IIoT-enabled smart factory transformation

Module 9: AI & Machine Learning in Maintenance

- Predictive algorithms in asset health
- Machine learning models for failure prediction
- Data training and validation methods
- AI-driven maintenance scheduling
- Case Study: AI-based predictive system in semiconductor manufacturing

Module 10: Overall Equipment Effectiveness (OEE) Optimization

- Availability, performance, and quality metrics
- OEE loss analysis
- Bottleneck identification
- Continuous improvement techniques
- Case Study: OEE improvement in packaging line

Module 11: Spare Parts & Inventory Optimization

- Critical spare classification
- ABC and XYZ analysis
- Just-in-time inventory strategies
- Cost reduction techniques
- Case Study: Spare parts optimization in heavy machinery plant

Module 12: Lean Maintenance Practices

- Waste elimination in maintenance operations
- Kaizen and continuous improvement
- 5S implementation in maintenance
- Standard work procedures
- Case Study: Lean transformation in steel manufacturing plant

Module 13: Asset Life Cycle Management

- Asset acquisition planning
- Maintenance during lifecycle stages
- Depreciation and replacement strategies
- Lifecycle cost analysis
- Case Study: Lifecycle optimization in oil refinery equipment

Module 14: Digital Transformation in Maintenance

- CMMS (Computerized Maintenance Management Systems)
- Digital twin technology
- Cloud-based maintenance platforms
- Cybersecurity in maintenance systems
- Case Study: Digital maintenance transformation in electronics manufacturing

Module 15: Maintenance Strategy Implementation Roadmap

- Strategy development frameworks
- Change management in maintenance systems

- Performance tracking dashboards
- Scaling maintenance improvements
- Case Study: Enterprise-wide maintenance transformation program

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

Start Date	End Date	Location	Price
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

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