Training Course on Predictive Maintenance and Asset Performance Management

Professional Development Training Course Outline

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

Course Introduction

In the age of Industry 4.0, Predictive Maintenance (PdM) and Asset Performance Management (APM) are transforming how organizations manage and optimize their critical assets. By integrating real-time data analytics, IoT, AI-driven diagnostics, and machine learning, businesses can not only reduce unplanned downtime but also extend equipment life cycles and improve operational efficiency. Training Course on Predictive Maintenance & Asset Performance Management empowers professionals with in-demand skills in predictive analytics, failure mode analysis, and intelligent maintenance systems.

This hands-on training is designed for engineers, operations managers, reliability professionals, and IT experts who are keen to adopt digital transformation, reduce maintenance costs, and leverage data-driven decision-making for performance excellence. Attendees will gain a deep understanding of how to harness advanced tools and frameworks to create reliable, safe, and optimized asset management strategies that align with modern organizational goals.

Programme Curriculum

Training Course on Predictive Maintenance & Asset Performance Management

Introduction

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Course Objectives

1. Understand the core principles of Predictive Maintenance (PdM) using real-time analytics.
2. Learn how to apply Artificial Intelligence (AI) and Machine Learning (ML) to equipment monitoring.
3. Implement effective Asset Performance Management (APM) strategies for diverse industries.
4. Explore IoT-enabled sensors and smart technologies for proactive maintenance.
5. Use data analytics and big data to drive predictive insights.
6. Apply Root Cause Analysis (RCA) and Failure Mode and Effects Analysis (FMEA).
7. Interpret Key Performance Indicators (KPIs) for maintenance optimization.
8. Design and implement Digital Twin models for real-time asset simulation.
9. Learn how cloud computing supports scalable asset management systems.
10. Gain insights into condition monitoring, vibration analysis, and thermography.
11. Conduct risk-based maintenance planning and criticality analysis.
12. Build and manage a CMMS (Computerized Maintenance Management System).
13. Develop strategic frameworks for sustainability and cost-effective operations.

Target Audience

1. Reliability Engineers
2. Maintenance Managers
3. Operations Supervisors
4. Mechanical and Electrical Engineers
5. Asset Integrity Professionals
6. Data Analysts and Data Scientists
7. Plant and Facility Managers
8. IT and OT Integration Specialists

Course Duration: 10 days

Course Modules

Module 1: Introduction to Predictive Maintenance

- Definition and evolution of maintenance strategies
- Reactive vs. preventive vs. predictive
- Technologies enabling PdM
- Benefits of PdM in modern industries
- Trends shaping the future of maintenance
- **Case Study: PdM transformation in a power generation company**

Module 2: Fundamentals of Asset Performance Management (APM)

- Core pillars of APM
- Asset lifecycle management
- Asset criticality and prioritization
- Role of digitization in APM
- APM software platforms overview
- **Case Study: APM success in an oil & gas plant**

Module 3: IoT & Sensor Technology for Predictive Maintenance

- Smart sensors and connectivity
- Real-time data acquisition
- Condition-based monitoring systems
- Wireless vs. wired sensors
- Integrating sensors with legacy systems
- **Case Study: Manufacturing firm adopts IoT-based PdM**

Module 4: Data Analytics and Big Data for Maintenance

- Types of maintenance data
- Data preprocessing techniques
- Descriptive vs. predictive analytics
- Introduction to Python for PdM
- Cloud storage and data governance
- **Case Study: Big Data-driven reliability in automotive sector**

Module 5: Machine Learning & AI Applications in PdM

- Machine learning algorithms for prediction
- Supervised vs. unsupervised learning
- AI-based diagnostics and prognosis
- Anomaly detection techniques
- Building ML models for failure prediction
- **Case Study: AI deployment in mining operations**

Module 6: Condition Monitoring Techniques

- Vibration analysis
- Ultrasonic monitoring
- Thermographic inspection
- Lubricant analysis
- Acoustic emission techniques
- **Case Study: Condition monitoring in HVAC systems**

Module 7: Root Cause Analysis & Failure Mode Analysis

- Why RCA matters
- FMEA methodology
- Failure data collection
- RCA tools: Fishbone, 5 Whys, Pareto
- Integrating RCA with CMMS
- **Case Study: FMEA implementation in a chemical plant**

Module 8: Key Performance Indicators (KPIs) in APM

- Defining effective KPIs
- Mean Time Between Failures (MTBF)
- Maintenance cost per unit
- Equipment uptime metrics
- Setting SMART targets
- **Case Study: KPI-driven improvements in a logistics firm**

Module 9: Building Digital Twins for Predictive Maintenance

- Concept of digital twins
- Components and data requirements

- Simulation vs. real-time modeling
- Role in maintenance forecasting
- Integration with APM systems
- **Case Study: Aerospace industry adopts digital twins**

Module 10: Cloud & Edge Computing in Maintenance

- Differences between cloud and edge
- Cloud-based APM platforms
- Scalability and real-time access
- Cybersecurity concerns
- Role in IoT data management
- **Case Study: Cloud migration in utilities sector**

Module 11: Risk-Based Maintenance Planning

- Understanding risk matrices
- Prioritizing assets by risk
- Maintenance task optimization
- Cost-benefit analysis
- Scheduling and resource planning
- **Case Study: Pharmaceutical plant risk-based planning**

Module 12: Introduction to CMMS

- What is a CMMS?
- Benefits and ROI of CMMS
- Selecting the right CMMS
- Integration with other systems
- Training staff on CMMS usage
- **Case Study: Food processing plant CMMS success**

Module 13: Cybersecurity in PdM & APM

- Threats in connected asset systems
- Securing data pipelines
- Role of IT/OT convergence
- Access control and compliance
- Incident response planning
- **Case Study: Cybersecurity audit in smart manufacturing**

Module 14: Sustainability and Green Asset Management

- Energy efficiency in maintenance
- Eco-friendly practices and materials
- Sustainable KPIs
- Reducing carbon footprint via APM
- Circular economy considerations
- **Case Study: Sustainable asset management in data centers**

Module 15: Project Management for PdM Implementation

- Scope and goals setting
- Stakeholder alignment
- Agile implementation approach
- Budgeting and ROI projections

- Change management strategies
- **Case Study: PdM project rollout in transport infrastructure**

Training Methodology

- Hands-on Labs using real-world tools and datasets
- Live Demonstrations of PdM software and dashboards
- Case Study Discussions based on actual industrial applications
- Interactive Workshops for algorithm building and data modeling
- Expert-Led Lectures with Q&A sessions
- Collaborative Group Activities and scenario simulations

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

Start Date	End Date	Location	Price
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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