Machine Health Monitoring Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Machine Health Monitoring Training Course is designed to equip engineers, technicians, and reliability professionals with advanced competencies in condition monitoring, vibration analysis, IoT-enabled diagnostics, AI-driven predictive maintenance, and real-time asset performance optimization. As industrial systems become increasingly automated and data-driven, the ability to continuously assess equipment health using sensor-based analytics, edge computing, and machine learning algorithms has become essential for reducing downtime, improving operational efficiency, and extending asset life cycles.

This course delivers a comprehensive understanding of fault detection, root cause analysis, rotating machinery diagnostics, thermal imaging analysis, oil condition monitoring, and predictive failure modeling. Learners will gain hands-on exposure to industry tools and frameworks used in asset performance management (APM), computerized maintenance management systems (CMMS), and industrial IoT platforms. By integrating real-world case studies from manufacturing, energy, automotive, and process industries, participants will develop the capability to implement scalable predictive maintenance strategies, reliability-centered maintenance (RCM), and AI-powered anomaly detection systems that align with global best practices.

Programme Curriculum

Machine Health Monitoring Training Course

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Course Duration

5 days

Course Objectives

1. Master Predictive Maintenance (PdM) strategies
2. Implement Condition-Based Monitoring (CBM) systems
3. Analyze Vibration Diagnostics & Signal Processing
4. Apply IoT-enabled Machine Health Monitoring
5. Develop AI & Machine Learning failure prediction models
6. Execute Root Cause Failure Analysis (RCFA)
7. Optimize Asset Performance Management (APM)
8. Integrate Smart Sensors & Edge Analytics
9. Understand Rotating Equipment Fault Diagnosis
10. Apply Thermography & Infrared Analysis
11. Monitor Oil & Lubrication Condition Systems
12. Improve Operational Equipment Efficiency (OEE)
13. Build Reliability-Centered Maintenance (RCM) frameworks

Target Audience

1. Maintenance Engineers
2. Reliability Engineers
3. Mechanical & Electrical Technicians
4. Plant Managers & Operations Leaders
5. Industrial IoT Engineers
6. Condition Monitoring Specialists
7. Data Analysts in Manufacturing
8. Asset Management Professionals

Course Modules

Module 1: Fundamentals of Machine Health Monitoring

- Overview of Industry 4.0 & Smart Manufacturing
- Basics of machine condition assessment
- Introduction to failure modes
- Sensor types and data acquisition systems
- Case Study: Manufacturing plant downtime reduction through basic monitoring system

Module 2: Vibration Analysis & Diagnostics

- Vibration signal fundamentals
- FFT spectrum analysis techniques
- Bearing fault detection methods
- Misalignment & imbalance diagnosis
- Case Study: Early bearing failure detection in a cement plant

Module 3: IoT-Based Condition Monitoring Systems

- Industrial IoT architecture
- Wireless sensor networks in factories
- Edge computing for real-time analytics
- Data integration with CMMS systems
- Case Study: Smart factory IoT deployment reducing unplanned shutdowns

Module 4: Thermography & Thermal Imaging

- Infrared thermography principles
- Heat signature interpretation
- Electrical system fault detection
- Mechanical overheating diagnostics
- Case Study: Electrical panel failure prevention in energy plant

Module 5: Oil Analysis & Lubrication Monitoring

- Tribology fundamentals
- Oil contamination detection techniques
- Wear particle analysis
- Lubrication optimization strategies
- Case Study: Gearbox lifespan extension in mining operations

Module 6: AI & Machine Learning for Predictive Maintenance

- Machine learning models for anomaly detection
- Predictive failure modeling techniques
- Data preprocessing & feature engineering
- AI-driven decision support systems
- Case Study: AI-based pump failure prediction in oil & gas industry

Module 7: Reliability Engineering & RCFA

- Reliability-centered maintenance (RCM)
- Failure Mode Effects Analysis (FMEA)
- Root Cause Failure Analysis techniques
- KPI tracking (MTBF, MTTR)
- Case Study: Production line reliability improvement in automotive plant

Module 8: Asset Performance Management & CMMS Integration

- Asset lifecycle management
- CMMS software integration
- KPI dashboards & performance analytics
- Maintenance scheduling optimization

- Case Study: Enterprise-wide APM transformation in FMCG industry

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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