# Reliability Engineering for Process Industries Training Course

Professional Development Training Course Outline

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

## Course Introduction

Reliability Engineering for Process Industries Training Course is designed to strengthen asset performance, reduce unplanned downtime, and optimize lifecycle cost management across oil & gas, petrochemical, power generation, mining, and manufacturing environments. This course integrates asset reliability optimization, predictive maintenance strategies, RCM (Reliability-Centered Maintenance), FMEA (Failure Modes and Effects Analysis), and condition-based monitoring to build a data-driven reliability culture aligned with Industry 4.0 and digital transformation initiatives.

In today's highly competitive process industries, operational excellence depends on maximizing equipment uptime, process safety, operational integrity, and maintenance efficiency. This training equips engineers and maintenance professionals with advanced tools such as root cause failure analysis (RCFA), asset performance management (APM), and reliability analytics using IoT and AI-based predictive maintenance systems. Participants will gain practical skills to reduce total cost of ownership (TCO), improve mean time between failures (MTBF), and enhance plant reliability maturity models.

## Programme Curriculum

**Reliability Engineering for Process Industries Training Course**

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**Course Duration**

5 days

**Course Objectives**

1. Master Reliability Engineering principles for process plants
2. Implement Reliability-Centered Maintenance (RCM) strategies
3. Conduct advanced Failure Modes and Effects Analysis (FMEA)
4. Improve Mean Time Between Failures (MTBF) and reduce downtime
5. Optimize Total Productive Maintenance (TPM) systems
6. Apply Root Cause Failure Analysis (RCFA) techniques
7. Develop predictive maintenance programs using condition monitoring
8. Integrate Industrial IoT (IIoT) for asset performance monitoring
9. Enhance equipment lifecycle management and asset integrity
10. Reduce operational risk through risk-based maintenance (RBM)
11. Improve spare parts optimization and inventory reliability
12. Apply data-driven reliability analytics and KPI dashboards
13. Build a sustainable reliability culture and continuous improvement system

**Target Audience**

1. Reliability Engineers
2. Maintenance Engineers & Supervisors
3. Plant & Operations Managers
4. Mechanical, Electrical & Instrumentation Engineers
5. Process Engineers in Oil & Gas and Petrochemicals
6. Asset Integrity & Inspection Engineers
7. Maintenance Planners & Scheduling Engineers
8. Industrial Data Analysts / Predictive Maintenance Specialists

**Course Modules**

**Module 1: Fundamentals of Reliability Engineering**

- Reliability concepts, failure patterns, and life-cycle costing
- Bath-tub curve and equipment degradation models
- KPIs-MTBF, MTTR, Availability, OEE
- Case Study: Refinery rotating equipment failure reduction program
- Industry benchmarking in petrochemical plants

**Module 2: Reliability-Centered Maintenance (RCM)**

- RCM decision logic and implementation framework
- Criticality analysis and functional failure identification

- Maintenance task optimization strategies
- Case Study: Power plant turbine RCM implementation success
- RCM in offshore oil platforms

**Module 3: Failure Modes and Effects Analysis (FMEA/FMECA)**

- Structured failure identification techniques
- Risk Priority Number (RPN) analysis
- Design vs process FMEA applications
- Case Study: Compressor system failure mitigation in LNG plant
- Cross-functional FMEA workshops

**Module 4: Root Cause Failure Analysis (RCFA)**

- Structured RCA methodologies
- Data collection and failure evidence analysis
- Corrective and preventive action planning
- Case Study: Heat exchanger fouling in chemical processing plant
- Recurrence prevention systems

**Module 5: Predictive Maintenance & Condition Monitoring**

- Vibration analysis, thermography, oil analysis
- AI-based predictive maintenance systems
- Sensor integration and IoT monitoring
- Case Study: Pump failure prediction in water treatment facility
- Digital twin applications in rotating equipment

**Module 6: Asset Performance Management (APM)**

- Asset health indexing and performance dashboards
- Reliability analytics and big data integration
- Real-time monitoring systems
- Case Study: Petrochemical plant APM transformation
- KPI-driven maintenance decision-making

**Module 7: Risk-Based Maintenance (RBM) & Safety Integrity**

- Risk assessment methodologies
- Maintenance prioritization based on risk ranking
- Process safety and reliability integration
- Case Study: Refinery safety-critical valve failure prevention
- Compliance with international reliability standards

**Module 8: Reliability Culture & Continuous Improvement**

- Building reliability-centered organizational culture
- Lean maintenance and Six Sigma integration
- Continuous improvement frameworks (Kaizen)
- Case Study: Manufacturing plant OEE improvement journey
- Workforce competency development in reliability

### 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 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **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:

**Register Online Now**

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