Failure Analysis & Prevention 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

In today’s highly competitive Industry 4.0 manufacturing environment, organizations must continuously improve operational reliability, quality assurance, and production efficiency. Unplanned breakdowns, recurring defects, and process failures significantly impact productivity, safety, and profitability. Failure Analysis & Prevention in Manufacturing Training Course is designed to equip professionals with advanced skills in root cause analysis, predictive maintenance, defect prevention, reliability engineering, and continuous improvement strategies to minimize downtime and enhance asset performance.

This comprehensive program focuses on modern tools such as FMEA (Failure Mode and Effects Analysis), 8D problem solving, Six Sigma methodologies, condition monitoring, and data-driven predictive analytics. Participants will learn how to systematically identify failure patterns, eliminate chronic manufacturing issues, and implement proactive prevention strategies aligned with global best practices in lean manufacturing and smart factory systems.

Programme Curriculum

Failure Analysis & Prevention in Manufacturing Training Course

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Course Duration

5 days

Course Objectives

1. Master Root Cause Analysis (RCA) techniques for manufacturing defects
2. Implement Failure Mode and Effects Analysis (FMEA) in production systems
3. Apply predictive maintenance strategies for equipment reliability
4. Reduce downtime using lean manufacturing principles
5. Improve quality using Six Sigma DMAIC methodology
6. Strengthen industrial problem-solving capabilities
7. Identify patterns using data-driven failure analytics
8. Enhance process optimization and workflow efficiency
9. Develop corrective and preventive action (CAPA) systems
10. Integrate condition monitoring and IoT-based diagnostics
11. Strengthen equipment lifecycle management
12. Reduce production losses through defect prevention strategies
13. Build a culture of continuous improvement (Kaizen mindset)

Target Audience

1. Manufacturing Engineers
2. Quality Assurance / Quality Control Managers
3. Maintenance Engineers & Technicians
4. Production Supervisors
5. Industrial Engineers
6. Reliability Engineers
7. Plant Managers & Operations Heads
8. Continuous Improvement / Lean Six Sigma Professionals

Course Modules

Module 1: Fundamentals of Failure Analysis

- Types of manufacturing failures (mechanical, electrical, process)
- Failure classification and reporting systems
- Introduction to RCA methodologies
- Understanding defect life cycles
- Data collection and documentation techniques
- **Case Study:** Analysis of recurring conveyor belt breakdowns in an FMCG plant

Module 2: Root Cause Analysis (RCA) Techniques

- 5 Whys technique in industrial environments
- Fishbone (Ishikawa) diagram application

- Fault tree analysis basics
- Human vs machine failure differentiation
- Structured problem-solving frameworks
- **Case Study:** Hydraulic system failure in an automotive assembly line

Module 3: Failure Mode and Effects Analysis (FMEA)

- Design and process FMEA fundamentals
- Risk Priority Number (RPN) calculation
- Severity, occurrence, detection analysis
- Prioritization of failure risks
- Updating FMEA documentation
- **Case Study:** Injection molding defect prevention in plastic manufacturing

Module 4: Predictive Maintenance & Condition Monitoring

- Vibration analysis and thermal imaging
- IoT sensors in smart manufacturing
- Predictive vs preventive maintenance strategies
- Equipment health monitoring systems
- Maintenance scheduling optimization
- **Case Study:** Predictive failure detection in CNC machining centers

Module 5: Lean Manufacturing & Waste Reduction

- Identification of manufacturing waste (Muda)
- Value stream mapping
- Kaizen continuous improvement cycles
- Bottleneck elimination strategies
- Standardized work procedures
- **Case Study:** Reducing scrap rates in textile production line

Module 6: Six Sigma for Failure Prevention

- DMAIC methodology application
- Statistical process control (SPC)
- Defect reduction techniques
- Process capability analysis
- Quality performance metrics
- **Case Study:** Defect reduction in pharmaceutical tablet production

Module 7: Corrective & Preventive Action (CAPA) Systems

- CAPA workflow development
- Non-conformance management
- Audit-based failure detection
- Documentation and compliance systems
- Continuous feedback loops
- **Case Study:** CAPA implementation in food processing plant contamination issue

Module 8: Smart Manufacturing & Digital Failure Analytics

- Industry 4.0 integration in failure analysis
- AI-based predictive failure detection
- Big data analytics in manufacturing
- Digital twin technology
- Automated reporting dashboards
- **Case Study:** Smart factory downtime reduction using predictive analytics in electronics manufacturing

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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