Advanced DMAIC Methodology 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

The Advanced DMAIC Methodology in Manufacturing Training Course is designed to equip professionals with cutting-edge Lean Six Sigma, process optimization, and data-driven decision-making skills. This training emphasizes the structured DMAIC framework to eliminate defects, reduce variation, and drive continuous improvement in modern manufacturing environments. Participants gain hands-on expertise in statistical process control (SPC), root cause analysis (RCA), value stream mapping (VSM), and real-time production analytics, enabling them to lead high-impact operational excellence projects across diverse industrial settings.

In today's competitive manufacturing landscape, organizations demand professionals who can deliver cost reduction, product quality enhancement, and process efficiency improvements using advanced methodologies. This course integrates Industry 4.0 principles, smart manufacturing tools, and lean production systems to build mastery in solving complex production challenges. Learners will work on real-world case studies from automotive, FMCG, pharmaceutical, and heavy engineering sectors to develop actionable improvement strategies that align with global quality standards such as ISO 9001, IATF 16949, and Six Sigma Black Belt practices

Programme Curriculum

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Course Duration

10 days

Course Objectives

1. Master Advanced DMAIC Lean Six Sigma Framework
2. Apply Statistical Process Control (SPC) in Manufacturing
3. Conduct Root Cause Analysis (RCA) for Defect Elimination
4. Implement Continuous Process Improvement Strategies
5. Optimize Manufacturing Cycle Time Reduction Techniques
6. Enhance Production Yield and Quality Performance Metrics
7. Utilize Data Analytics for Process Optimization
8. Develop expertise in Lean Manufacturing Waste Reduction (7 Wastes)
9. Improve Operational Efficiency using Value Stream Mapping
10. Strengthen Quality Control and Assurance Systems
11. Deploy Industry 4.0 Smart Manufacturing Tools
12. Achieve Cost Optimization and Productivity Enhancement
13. Lead Cross-Functional Process Improvement Projects

Target Audience

1. Manufacturing Engineers
2. Quality Assurance / Quality Control Managers
3. Production Supervisors & Plant Managers
4. Industrial Engineers
5. Lean Six Sigma Practitioners
6. Operations Managers
7. Process Improvement Consultants
8. Supply Chain & Production Planning Professionals

Course Modules

Module 1: Introduction to DMAIC & Lean Six Sigma

- DMAIC framework fundamentals
- Lean manufacturing principles
- Six Sigma overview
- Manufacturing quality evolution
- KPI-based performance systems

- **Case Study:** Reducing defect rates in an automotive assembly line

Module 2: Define Phase - Problem Identification

- Problem statement development
- Project charter creation
- VOC (Voice of Customer) analysis
- CTQ (Critical to Quality) mapping
- Stakeholder alignment
- **Case Study:** Defining bottlenecks in FMCG packaging process

Module 3: Measure Phase - Data Collection Systems

- Data collection planning
- Measurement system analysis (MSA)
- Process capability analysis
- Baseline performance metrics
- Sampling techniques
- **Case Study:** Measuring production variation in textile manufacturing

Module 4: Statistical Process Control (SPC)

- Control charts (X-bar, R, P charts)
- Process stability analysis
- Variation monitoring
- Outlier detection
- Real-time quality tracking
- **Case Study:** SPC implementation in pharmaceutical production

Module 5: Analyze Phase - Root Cause Analysis

- Fishbone diagram (Ishikawa)
- 5 Whys technique
- Pareto analysis
- Hypothesis testing
- Failure mode identification
- **Case Study:** Analyzing downtime in metal fabrication plant

Module 6: Hypothesis Testing & Statistical Tools

- T-tests and ANOVA
- Regression analysis
- Correlation studies
- Data validation methods
- Experimental design basics
- **Case Study:** Quality variation in injection molding process

Module 7: Improve Phase -Solution Development

- Brainstorming techniques
- Kaizen implementation
- Lean improvement tools

- Pilot testing methods
- Risk assessment
- **Case Study:** Improving throughput in beverage production line

Module 8: Lean Manufacturing Optimization

- 7 wastes elimination
- Just-in-Time (JIT) production
- Kanban systems
- 5S workplace organization
- Flow optimization
- **Case Study:** Lean transformation in electronics assembly plant

Module 9: Value Stream Mapping (VSM)

- Current state mapping
- Future state design
- Bottleneck identification
- Lead time reduction
- Process flow analysis
- **Case Study:** VSM in automotive supply chain

Module 10: Control Phase - Sustainability Systems

- Control plans development
- SOP standardization
- Audit mechanisms
- KPI dashboards
- Continuous monitoring
- **Case Study:** Sustaining quality in food processing industry

Module 11: Advanced Quality Management Systems

- ISO 9001 integration
- IATF 16949 standards
- Compliance frameworks
- Documentation control
- Audit readiness
- **Case Study:** QMS implementation in auto component manufacturing

Module 12: Industry 4.0 in Manufacturing

- Smart factory concepts
- IoT in production
- AI-based quality control
- Predictive maintenance
- Digital transformation
- **Case Study:** Smart manufacturing in robotic assembly line

Module 13: Production Cost Optimization

- Cost of poor quality (COPQ)

- Resource utilization analysis
- Energy efficiency improvement
- Waste cost reduction
- Budget optimization
- **Case Study:** Cost reduction in steel manufacturing plant

Module 14: Advanced Data Analytics in Manufacturing

- Big data applications
- Dashboard reporting tools
- Predictive analytics
- Machine learning basics
- Real-time monitoring systems
- **Case Study:** Predicting machine failure in CNC operations

Module 15: Capstone DMAIC Project

- End-to-end DMAIC execution
- Cross-functional collaboration
- Real industrial problem solving
- Performance evaluation
- Final presentation & reporting
- **Case Study:** End-to-end defect elimination in automotive OEM plant

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
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

Ready to enroll or request a customized program? Book online or contact us:

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