Six Sigma for Product Design 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 manufacturing landscape, Design for Six Sigma (DFSS) has become a critical strategic approach for organizations aiming to build defect-free products from the design stage itself. Unlike traditional Six Sigma, which focuses on process improvement, DFSS emphasizes robust product design, predictive quality engineering, and customer-centric innovation. This training course equips professionals with advanced tools such as DMADV (Define, Measure, Analyze, Design, Verify), Quality Function Deployment (QFD), FMEA, statistical modeling, and tolerance design to ensure optimal product performance, reduced variation, and enhanced customer satisfaction.

Manufacturers across automotive, aerospace, electronics, healthcare devices, and industrial equipment sectors are increasingly adopting DFSS to reduce cost of poor quality (COPQ), accelerate time-to-market, and achieve lean product development excellence. Six Sigma for Product Design in Manufacturing Training Course provides a structured pathway to master data-driven design optimization, reliability engineering, and Six Sigma-based innovation frameworks, enabling participants to design products that meet or exceed Six Sigma quality levels (3.4 DPMO). By integrating advanced analytics, simulation techniques, and voice-of-customer insights, organizations can achieve breakthrough performance in product lifecycle management and manufacturing excellence.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of Design for Six Sigma (DFSS) methodology
2. Apply DMADV framework in product design lifecycle
3. Translate Voice of Customer (VOC) into Critical-to-Quality (CTQ) requirements
4. Perform advanced Quality Function Deployment (QFD) analysis
5. Use Failure Mode and Effects Analysis (FMEA) for risk mitigation
6. Apply statistical design of experiments (DOE) for optimization
7. Develop robust product design strategies for variability reduction
8. Implement tolerance design and stack-up analysis techniques
9. Utilize simulation and digital twin concepts in product validation
10. Improve product reliability engineering and lifecycle performance
11. Reduce cost of poor quality (COPQ) through DFSS tools
12. Integrate lean manufacturing principles with DFSS design approach
13. Achieve Six Sigma level product quality (3.4 defects per million opportunities)

Target Audience

1. Product Design Engineers
2. Manufacturing Engineers
3. Quality Assurance & Quality Control Professionals
4. Process Improvement Specialists
5. R&D Engineers and Innovation Teams
6. Industrial Engineers
7. Project Managers in Manufacturing
8. Six Sigma Green Belts, Black Belts & Master Black Belts

Course Modules

Module 1: Introduction to DFSS & Six Sigma in Product Design

- Evolution from Six Sigma to DFSS
- DMADV vs DMAIC comparison

- Role of DFSS in manufacturing excellence
- Key performance metrics in design quality
- Customer-centric design philosophy
- **Case Study:** Automotive component manufacturer reducing design defects using DFSS framework

Module 2: Voice of Customer (VOC) & CTQ Translation

- Collecting and analyzing VOC data
- Converting VOC into CTQ requirements
- Kano model for customer satisfaction
- Prioritization matrices
- Requirement traceability tools
- **Case Study:** Medical device company improving usability through VOC-driven design

Module 3: Quality Function Deployment (QFD)

- House of Quality development
- Linking customer needs to engineering specs
- Competitive benchmarking
- Weighting and prioritization techniques
- Design alignment strategies
- **Case Study:** Electronics manufacturer optimizing product features using QFD

Module 4: Failure Mode and Effects Analysis (FMEA)

- Design FMEA vs Process FMEA
- Risk Priority Number (RPN) calculation
- Failure identification and mitigation planning
- Severity, occurrence, detection scoring
- Control plan integration
- **Case Study:** Aerospace supplier reducing critical failure risks through DFMEA

Module 5: Design of Experiments (DOE)

- Full factorial and fractional factorial designs
- Factor screening techniques
- Response surface methodology
- Optimization of design parameters
- Statistical significance testing
- **Case Study:** Chemical manufacturing company optimizing product strength using DOE

Module 6: Robust Design & Tolerance Engineering

- Taguchi methods for robust design
- Tolerance stack-up analysis
- Variation reduction techniques
- Sensitivity analysis
- Noise factor control
- **Case Study:** Precision machining company improving dimensional accuracy using robust design

Module 7: Simulation & Digital Product Validation

- Computer-aided engineering (CAE) tools
- Finite Element Analysis (FEA) basics
- Digital twin applications
- Virtual prototyping methods
- Predictive performance modeling
- **Case Study:** Automotive OEM reducing prototype cycles using digital simulation

Module 8: DFSS Deployment & Manufacturing Integration

- Integrating DFSS with lean manufacturing
- Product lifecycle management (PLM) alignment
- Cost of Poor Quality (COPQ) reduction
- Design governance frameworks
- Continuous improvement strategies
- **Case Study:** Industrial equipment manufacturer achieving zero-defect launch strategy

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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