Six Sigma for Chemical Engineers 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

Six Sigma for Chemical Engineers Training Course is designed to equip chemical engineering professionals with advanced process improvement, statistical quality control, and data-driven decision-making skills. In today's highly competitive chemical, petrochemical, and manufacturing industries, organizations demand Lean Six Sigma expertise, process optimization, defect reduction, and operational excellence to achieve higher productivity, safety compliance, and cost efficiency. This course integrates core Six Sigma methodologies such as DMAIC, statistical process control (SPC), and root cause analysis tailored specifically for chemical processes, reactors, plant operations, and industrial production systems.

The training focuses on real-world chemical engineering challenges such as yield improvement, process safety enhancement, waste reduction, energy optimization, and continuous improvement in large-scale production environments. Participants will gain hands-on exposure to industry tools like Minitab, process mapping, failure mode and effects analysis (FMEA), and capability analysis. By the end of the course, learners will be able to lead Six Sigma Green Belt and Black Belt level projects, driving measurable improvements in chemical plant performance, sustainability, and profitability.

Programme Curriculum

Six Sigma for Chemical Engineers Training Course

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Course Duration

5 days

Course Objectives

1. Master Lean Six Sigma methodologies for chemical processes
2. Apply DMAIC framework in chemical plant optimization
3. Conduct statistical process control (SPC) in production systems
4. Improve process yield and reduce industrial waste
5. Implement root cause analysis (RCA) in chemical operations
6. Enhance process safety management (PSM) using Six Sigma tools
7. Optimize reactor performance and chemical reaction efficiency
8. Reduce variability in batch and continuous processes
9. Apply FMEA for risk assessment in chemical engineering systems
10. Use data analytics for process optimization and decision-making
11. Improve energy efficiency and sustainability in chemical plants
12. Achieve defect reduction and quality improvement in production
13. Lead continuous improvement and operational excellence projects

Target Audience

1. Chemical Engineers
2. Plant Managers and Operations Supervisors
3. Quality Assurance / Quality Control Engineers
4. Process Safety and Risk Management Professionals
5. Petrochemical and Refinery Engineers
6. Manufacturing and Industrial Engineers
7. Graduate Engineers and Trainee Engineers
8. Continuous Improvement / Lean / Six Sigma Practitioners

Course Modules

Module 1: Introduction to Lean Six Sigma in Chemical Engineering

- Six Sigma principles and chemical industry applications
- Lean manufacturing integration in chemical plants
- DMAIC roadmap overview
- Process variability in chemical operations
- Key performance indicators (KPIs) in production
- **Case Study:** Reduction of impurities in a polymer production line using DMAIC

Module 2: Define Phase & Process Mapping

- Problem definition in chemical systems
- SIPOC diagrams for chemical processes
- Voice of Customer (VOC) analysis
- Project charter development
- Critical-to-Quality (CTQ) identification
- **Case Study:** Defining yield loss issues in a fertilizer manufacturing plant

Module 3: Measure Phase & Data Collection

- Data collection strategies in chemical plants
- Measurement system analysis (MSA)
- Baseline performance metrics
- Process capability
- Sampling techniques in batch processes
- **Case Study:** Measuring variability in distillation column output quality

Module 4: Analyze Phase & Root Cause Analysis

- Fishbone diagrams
- 5 Whys analysis in process failures
- Hypothesis testing in chemical data
- Correlation and regression analysis
- Identifying bottlenecks in production systems
- **Case Study:** Identifying root cause of catalyst deactivation in a reactor

Module 5: Improve Phase & Process Optimization

- Process redesign techniques
- Design of Experiments (DOE)
- Lean tools for waste elimination
- Optimization of reaction conditions
- Pilot testing and validation
- **Case Study:** Improving yield in a batch reactor through temperature optimization

Module 6: Control Phase & Sustaining Improvements

- Control charts
- Standard operating procedures
- Process monitoring systems
- Control plans in chemical plants
- Continuous improvement culture
- **Case Study:** Sustaining reduced defect rate in a chemical packaging line

Module 7: Advanced Six Sigma Tools for Chemical Engineers

- FMEA and risk priority number (RPN)
- Advanced SPC techniques
- Multivariate analysis
- Process simulation tools
- Reliability engineering concepts
- **Case Study:** Risk reduction in ammonia production plant safety system

Module 8: Lean Six Sigma Project Implementation

- End-to-end DMAIC project execution
- Green Belt/Black Belt project structure
- Stakeholder management
- Financial impact analysis
- Presentation of project results
- **Case Study:** Cost reduction and energy optimization in petroleum refining unit

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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