Design of Experiments (DoE) for Process Optimization Training Course

Professional Development Training Course Outline

Category	Quality Assurance and ISO standards	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Design of Experiments (DoE) for Process Optimization is a powerful training program that equips professionals with the skills and knowledge to systematically plan, conduct, and analyze controlled tests that identify the factors influencing process performance. Design of Experiments (DoE) for Process Optimization Training Course highlights advanced statistical methods, data-driven decision-making, and experimental design techniques to ensure process efficiency, reduced variability, and enhanced quality outcomes. By combining theory with practical case studies, participants will gain hands-on experience in applying DoE principles to solve real-world industrial challenges.

With a growing emphasis on process improvement, lean manufacturing, and Six Sigma methodologies, the Design of Experiments (DoE) course is a key training solution for professionals seeking to increase productivity, optimize resources, and ensure continuous improvement. Through strategic application of experimental designs, participants will enhance their problem-solving capabilities and strengthen their ability to deliver measurable results in dynamic business environments.

Programme Curriculum

Design of Experiments (DoE) for Process Optimization Training Course

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Course Objectives

1. Understand the fundamentals of Design of Experiments (DoE).
2. Apply DoE techniques to optimize industrial and business processes.
3. Interpret statistical results for evidence-based decision making.
4. Identify critical factors impacting process performance.
5. Implement factorial and fractional factorial designs.
6. Utilize regression analysis and ANOVA for experimental data.
7. Enhance product quality through controlled experiments.
8. Reduce process variability and improve efficiency.
9. Apply DoE in Six Sigma and Lean environments.
10. Integrate DoE into quality management systems.
11. Use software tools for designing and analyzing experiments.
12. Evaluate case studies to bridge theory and practice.
13. Develop long-term strategies for process optimization.

Organizational Benefits

?? Improved process efficiency.

?? Enhanced product and service quality.

?? Reduced costs through optimization.

?? Stronger problem-solving skills in teams.

?? Faster decision-making supported by data.

?? Increased customer satisfaction.

?? Better resource allocation and utilization.

?? Greater innovation in product and process design.

?? Competitive advantage through continuous improvement.

?? Sustainable long-term growth and profitability.

Target Audiences

1. Process Engineers
2. Quality Managers
3. Production Supervisors
4. Six Sigma Practitioners
5. R&D Scientists
6. Manufacturing Leaders
7. Industrial Engineers
8. Continuous Improvement Specialists

Course Duration: 10 days

Course Modules

Module 1: Introduction to Design of Experiments

?? Concept and importance of DoE in process optimization

?? Historical development and applications of DoE

?? Terminology and statistical foundations

?? Types of experimental designs

?? Case study on DoE fundamentals

?? Practical exercise on identifying experiment factors

Module 2: Statistical Foundations for DoE

?? Basic probability and distributions

?? Hypothesis testing in DoE

?? Confidence intervals and significance levels

?? Correlation and regression basics

?? Case study on statistical data interpretation

?? Hands-on calculations with sample datasets

Module 3: Planning and Structuring Experiments

?? Defining objectives and scope of experiments

?? Identifying independent and dependent variables

?? Randomization and replication concepts

?? Blocking and confounding in design

?? Case study on experiment planning

?? Group activity on experiment structuring

Module 4: Full Factorial Designs

?? Definition and application of factorial experiments

?? Two-level and multi-level factorial designs

?? Estimating main effects and interactions

?? Analyzing factorial experiments using ANOVA

?? Case study on factorial design in manufacturing

?? Practical software-based factorial analysis

Module 5: Fractional Factorial Designs

?? Importance of reducing experimental runs

?? Concept of resolution in designs

?? Trade-offs between accuracy and resources

?? Confounding patterns in fractional factorials

?? Case study on fractional factorial optimization

?? Software demonstration for fractional design

Module 6: Response Surface Methodology (RSM)

?? Introduction to RSM and optimization

?? Central Composite Designs (CCD)

?? Box-Behnken designs for experiments

?? Fitting response surface models

?? Case study on RSM in product development

?? Software practice for response surfaces

Module 7: Regression and ANOVA Applications

?? Simple and multiple regression models

?? Model validation and residual analysis

?? One-way and two-way ANOVA

?? Interaction effects interpretation

?? Case study on regression analysis in industry

?? Data modeling exercises

Module 8: Mixture and Taguchi Designs

?? Introduction to mixture experiments

?? Constraints and mixture component analysis

?? Overview of Taguchi robust design methodology

?? Signal-to-noise ratio and performance measures

?? Case study on Taguchi design in service quality

?? Practical exercises on mixture designs

Module 9: DoE in Lean and Six Sigma

?? Role of DoE in DMAIC methodology

?? Integration with Lean tools

?? Process capability and control charts

?? Linking DoE to quality metrics

?? Case study on DoE in Six Sigma projects

?? Group exercise on Lean Six Sigma optimization

Module 10: Process Optimization and Control

?? Principles of process optimization

?? Stability and capability analysis

?? Continuous versus batch processes

?? Linking DoE outcomes to control systems

?? Case study on optimization in chemical processes

?? Simulation exercise on process improvement

Module 11: Advanced Experimental Designs

?? Nested and split-plot designs

?? Sequential experimentation strategies

?? Multi-response optimization

?? Screening designs for factor identification

?? Case study on advanced industrial designs

?? Software analysis of advanced designs

Module 12: Practical Software Applications in DoE

?? Overview of DoE software tools (Minitab, JMP, Design-Expert)

?? Setting up experiments in software

?? Interpreting software output

?? Visualizing results through plots and charts

?? Case study on DoE software application

?? Guided lab session on software practice

Module 13: Real-World Industrial Case Studies

?? Automotive industry applications

?? Pharmaceutical process optimization

?? Food and beverage product development

?? Electronics and semiconductor processes

?? Case study compilation from multiple industries

?? Group discussion on lessons learned

Module 14: DoE Implementation in Organizations

?? Building DoE culture in teams

?? Overcoming resistance to change

?? Aligning DoE with strategic objectives

?? Training and skill-building for staff

?? Case study on successful DoE implementation

?? Role-playing activity for organizational alignment

Module 15: Project Presentation and Evaluation

?? Participants present DoE project findings

?? Peer review and constructive feedback

?? Linking projects to organizational goals

?? Reflection on key learnings

?? Case study review of capstone project

?? Course wrap-up and certification process

Training Methodology

?? Instructor-led interactive lectures

?? Group discussions and brainstorming

?? Hands-on exercises with datasets

?? Case study analysis for real-world application

?? Software-based demonstrations and practice

?? Final project presentation and feedback

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

Start Date	End Date	Location	Price
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

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