

DESIGN OF EXPERIMENTS (DOE)

Introduction:

A design of experiment (DOE) is proactive technique in which a test or series of test in which purposeful changes are made to the input variables of a process so that we can observe and identify corresponding changes in the output response.

DOE is an important engineering tool for improving a process and it has extensive application in the development of new process. It is a strategic, enabling methodology to improve process yields and product quality. At the same time, it reduces the product development time and overall costs by changing one or more process characteristics after studying their effects on the product. It is one of the most powerful statistical tools to achieve an optimal process and to be used in the Six Sigma Breakthrough Methodologies.

Course Objectives:

This 2-day competency-based workshop introduces the theory, methodology and application of DOE. Upon completion of this workshop, participants will get an in-depth overview of DOE concepts and methodology, and apply these to their working environment. This workshop is designed to provide a step-by-step examination of the experimentation process, plus provides an overview of the statistical concepts that validate the DOE methodology. This workshop will also include the use of the Minitab software tool for analyzing data.

Course Contents:

- 1.0 Introduction and Principle of Design of Experiments
 - 1.1 DOE in Improvement Process
 - 1.2 Historical Summary
 - 1.3 Principles and Concepts

- 2.0 Basic Statistics
 - 2.1 Understanding Variations
 - 2.2 t, F and Normal distribution
 - 2.3 Confidence interval Study
 - 2.4 Hypothesis testing
 - 2.5 Use of p-values
 - 2.6 Comparative studies

- 3.0 Analysis Of Variance (ANOVA)
 - 3.1 One-way ANOVA

- 3.2 Two-way ANOVA
- 3.3 Multi-variant of ANOVA
- 3.4 Tukey's Post Hoc Test

- 4.0 Design of Experiments
 - 4.1 Latin Squares Experiments
 - 4.2 2 factors 2 levels Full Factorial Design of Experiments
 - 4.3 Full Factorial Design of experiments with 3 factors 2 levels
 - 4.4 Fractional Factorial experiments design and Plackett-Burman design

- 5.0 Exercises / Case Studies

- 6.0. Wrap-up – Questions and Answers Session

Who Should Attend:

This course is for Quality Professionals, Quality Engineers, Production Engineers & Managers, Design Engineers, Project Engineers, Front Line Managers or for any personnel who does not have any knowledge of statistics and Design of Experiments and wish to apply this tool in their improvement efforts.

Training Methodology:

Participants will learn through a blend of lectures and case studies. Participants are encouraged to bring real cases to class and apply the techniques by using Excel or Minitab software.

Award of Certificate:

Participants will be issued with a Certificate of Successful Completion upon meeting 75% of the required course attendance.

Duration:

2 days (14 hours)

Course Fee:

\$700 nett per trainee (GST is not applicable).

(Course fee is inclusive of all training materials and light refreshments.)