



## DESIGN OF EXPERIMENTS (DOE)

### Introduction

Statistical Control chart techniques deal with on-line control methods in which it is necessary to determine if the process is in a state of statistical control. Adjustments are made on the process as data from the process are collected and analyzed to determine the Process State. Although this method is no doubt useful, it nevertheless provides an action-taking framework in the phase when the product is manufactured or in the phase of service.

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. It also has extensive application in the development of new process.

### Course Objectives

Proper application of DOE can result in:

1. Improve yield
2. Reduced variability
3. Reduced development time
4. Reduced overall cost and improves profitability

The application of DOE is the most important tool use in the Six Sigma Breakthrough Methodologies.

### Course Contents

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##### Course Contents

##### 1.0 Introduction and Principle of Design of Experiments

- 1.1 Objectives and Types of DOE
- 1.2 Historical Summary
- 1.3 Strategy of Experimentation
- 1.4 Barrier to effective experiment
- 1.5 Some Examples of DOE

##### 2.0 One-Factor Experiments

- 2.1 2-level Experiments
  - 2.1.1 t, F and Normal distribution
  - 2.1.2 Confidence Interval Study
- 2.2 Multi-Level Experiments
  - 2.2.1 Analysis Of Variance (ANOVA)
  - 2.2.2 Types of Analysis of Variance
  - 2.2.3 Degrees of Freedom
  - 2.2.4 One-way ANOVA

##### 3.0 Factors Experiments

- 3.1 Two-way ANOVA
- 3.2 N-way ANOVA

##### 4.0 2<sup>n</sup> Factorial Design

- 4.1 Orthogonality
- 4.2 2 Factors Design
- 4.3 3 Factors Design 2

##### 5.0 Fractional Factorial Design

##### 6.0 Handling Experimental Noise

### Who Should Attend

QA/Process/Product Managers, Engineers who are involved directly in quality improvement programmes.

### Award of Certificate

Certificate of Attendance will be issued to participants who have attended at least 75% of the course.

### Duration

2 Days (9:00am – 5:00pm)

### Course Fees

S\$ 428 (For SQI Member) S\$ 449.40 (For Non-Member)

Course Fees are inclusive of GST. Price is inclusive of two tea breaks.