

**Course Title: DESIGN OF EXPERIMENT  
(DOE) (THEORY)**

**Course Code: MMF 125 (T)**

**Course Background / Summary:**

Design of experiments (DOE) or experimental design is the design of any information-gathering exercises where variation is present, whether under the complete control of the experimenter or not. However, in statistics, these terms are usually used for controlling experiments. Formal planned experimentation is often used in evaluating physical objects, chemical formulations, structures, components, and materials.

Other types of study, and their design, are discussed in the articles on opinion polls and statistical surveys (which are types of observational study), natural experiments, and quasi-experiments (for example, quasi-experimental design). See Experiment for the distinction between these types of experiments or studies. In the design of experiments, the experimenter is often interested in the effect of some process or intervention (the "treatment") on some objects (the "experimental units"), which may be people, parts of people, groups of people, plants, animals, etc. Design of experiments is thus a discipline that has very comprehensive application across all the natural and social sciences and engineering.

**Course Objectives:**

- Understand the methodology of design of experiments
- Plan a design of the experiment
- Explain the importance of each concept used in the design of experiments
- Recognize variables in an experiment and how they interact
- Understand how to create and use an analysis of variance (ANOVA) table
- Understand how to conduct and analyze the results of a contrast test
- Identify the advantages, disadvantages, assumptions, and hypotheses related to various types of designs, including completely randomized design, completely randomized block design, Latin Square design, and factorial designs
- Analyze the results of designed experiments

**Target Audience:**

- Manufacturing, Quality Engineering, Production Engineering, Research & Development

**Course Duration: 3 Days**

## Course Contents

**1.0 Introduction to Design of Experiments (DOE)**

**4.0 Full Factorial Experiment**

**2.0 Planning for Effective Experiment**

**5.0 Mini Project: Paper Helicopter**

**3.0 Experimentation - DOE Example**