

Design of Experiment (DOE) Workshop Details

Description

Introduces basic concepts of Design of Experiments. Specific topics covered include: full factorial designs, fractional factorial designs, screening designs, design resolution. Course will use MINITAB statistical software. **Duration - 24 hours.**

Goal

Understand benefit of disciplined Design of Experiment methods for building models to investigate causal relationships between predictors and a response.

Outline / Topics

Design of Experiment Overview

- Experimental Methods
- Full Factorial Designs
- Screening Designs

Fractional Factorial Design of Experiment

- Factor Selection and Settings
- Choosing the Fraction
- Confounding
- Design Resolution

Full Factorial Design of Experiment

- Factor Selection and Settings
- Unique Combinations of Settings for Factors
- Randomization
- Conducting the Experiment
- Analyzing the Experimental Results
- Building a Predictive Model
- Validating the Model

Case Study

- Fractional Factorial DOE
- Collapsing Fractional Factorial DOE to Full Factorial Design
- Full Factorial DOE

Results

Upon successful completion of the training, participants will have demonstrated the ability to:

1. Create a Design of Experiment design in Minitab, conduct an experiment and analyze the results.
2. Recognize the risks associated with building a model based on a DOE.
3. Create and interpret an alias table to explain confounding in fractional designs.
4. Use DOE results to build a model that explains the response as a function of the experimental variables.
5. Evaluate residual plots to confirm model's validity.
6. Evaluate Factorial plots to understand main effects, interaction effects and overall response.
7. Validate model created and use it to set appropriate levels for causal factors to achieve desired response.