



## **Design of Experiments**

(16 hours)

### **Course Description:**

Design of Experiments is specifically designed to meet the analytical needs of those individuals working within a variety of industries. Instruction covers both basic and advanced concepts for the design and analysis of experiments.

### **Audience:**

This course is required for all scientists, engineers and quality professionals who actively work on any aspect of discovery product and process development where the goal is to characterize, optimize and improve product and process performance.

### **Course Objectives:**

Upon completion of the course the participants will be able to:

- Select factors and responses for experiments
- Design experiments appropriate for the information of interest
- Use and apply the structures of orthogonal arrays for product and process development and problem solving
- Ensure the experimental design is efficient
- Use regression techniques in order to analyze the results and make process/product improvements
- Use JMP software to design and analyze experiments

**Software:** JMP

**Prerequisites:** Engineering Statistics and Data Analysis is a recommended prerequisite for this course

### **Course Outline:**

**Introduction to DOE**

**Experimental Preparation**

**Full Factorial Designs**

**Screening Designs**

Augment design

**Custom Designs**

Generating custom designs

Evaluating custom designs

Analysis of custom designs



Simulation for full distribution modeling  
Strategies to minimize experimental size  
Adding covariate and uncontrolled factors  
Life or repeated measures experiments  
Disallowed combinations (nested DOEs)  
Split Plot designs  
Adding dummy variables  
Blocking designs  
Mixtures in custom designs  
Setting constraints in a DOE

### **Response Surface Designs**

### **Special Topics in DOE (optional)**

Supersaturated designs  
Strip plot designs