Experiment Design

Course Outlines

- **Design of Experiments**
    - Identify the characteristics of an experiment
    - Identify the characteristics of the scientific method
    - Identify proper use of the scientific method in an experiment
    - State the importance of designing experiments
    - Identify aspects of the methodology of design of experiments, including experimental geometry and response mapping
    - Match basic terms used in design of experiments with their definitions
    - Recognize the advantages of design of experiments over classical experimentation techniques
    - Identify ways in which variables in an experiment may interact
    - Identify the steps in designing an experiment and the tasks involved in each step
- **Planning a Design of Experiment**
    - Identify the qualities of a designed experiment
    - Create appropriate objectives for an experiment
    - Identify response variables and their significance
    - Recognize, define and classify independent variables in an experiment
    - Identify three ways to eliminate extraneous variables
    - Identify additional requirements for a designed experiment, including balance, orthogonality, error measurement, appropriate sample size and simplicity
- **Analyzing a Design of Experiment**
    - Identify the procedure for testing a hypothesis using data from an ANOVA table
    - Identify the steps in performing a t-ratio test

- **Types of Designs, Part One**
    - Completely randomized design
    - Completely randomized block design
    - Incomplete randomized block design
    - Latin Square design
- **Types of Designs, Part Two**
    - Full factorial design
    - Fractional factorial design
- **Conducting the Experiment**
    - Analyzing the experiment
    - Residual analysis
    - Taguchi's quality philosophy and methodology
    - Human aspects of designed experiments