

COURSE SYLLABUS E M 585

Course Name: Design of Experiments

Course Number: E M 585

Semester Credits: 3

Instructor/Contact Information: David Paulus, PhD, PE, CHFEP, CQE, CPEM, Jonah
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Meeting Time: Online Zoom, Monday 6:15 – 8:45 pm Pacific

Prerequisites: EM 503 or Statistics

Textbook: *Design and Analysis of Experiments, 8th Edition*, by Douglas C. Montgomery, ISBN 978-1-118-14692-7

Course Description and Objectives: Analysis of variance using design of experiments provides a systematic and efficient method of designing and analyzing experiments to determine the conditions that directly affect variation in measured and observed data. Determining the factors that result in significant improvements is a critical tool in research and development, and reducing variability is essential for improving quality. In this course students will develop the ability to perform in-depth analyses of variance using the techniques that partition variability in order to make data-driven decisions based on statistically significant differences and interactions.

Learning Outcomes: Students will learn to:

- Conduct Simple Comparative Experiments (t-tests)
- Analyze Single Factor Variance (ANOVA)
- Apply Randomized Blocks (blocking for nuisance variables)
- Perform Two Factor ANOVA with and without replication
- Apply Factorial Designs

Assessed Learning Outcomes:

- 2B) Demonstrate problem solving abilities and rational, effective decision making.
- 3B) Demonstrate the ability to analyze, understand and improve company practice