OFFICIAL SYLLABUS
STAT 481- DESIGN AND ANALYSIS OF EXPERIMENTS
(Adopted - Summer 2004[1])

Catalog Description. Design for experimentation and their statistical inference. One-way, two-way classification; complete and incomplete block designs. Factorial and fractional factorial designs. Response surface designs. Prerequisite: Stat 380 or 480a, b or consent of instructor.

Textbook: Design and Analysis of Experiments, 8th edition, by Douglas C. Montgomery

Course Outline and Topics

Chapter 2   Simple Comparative Experiments
  2.2 Basic Statistical Concepts
  2.3 Sampling and Sampling Distributions
  2.4 Inferences About the Difference in Means, Randomized Designs
  2.5 Inferences About the Difference in Means, Paired Comparison Designs
  2.6 Inferences About the Variances of Normal Distributions

Chapter 3   Experiments with a Single Factor
  3.2   The Analysis of Variance
  3.3   Analysis of the Fixed Effects Model
  3.4   Model Adequacy Checking
  3.5   Practical Interpretation of Results
  3.6   Sample Computer Output
  3.7   The Random Effects Model

Chapter 4   More About Single-Factor Experiments
  4.1   Choice of Sample Size
  4.2   Discovering Dispersion Effects
  4.3   Fitting Response Curves in the Single-Factor Model
  4.4   The Regression Approach to the Analysis of Variance
  4.6   Repeated Measures
  4.7   The Analysis of Covariance

Chapter 5   Randomized Blocks, Latin Squares, and Related Designs
  5.1   The Randomized Complete Block Design
  5.2   The Latin Square Design
  5.3   The Graeco-Latin Square Design
  5.4   Balanced Incomplete Block Designs

Chapter 6   Introduction to Factorial Designs
  6.1   Basic Definitions and Principles
  6.2   The Advantage of Factorials
  6.3   The Two-Factor Factorial Design
  6.4   The General Factorial Design
  6.5   Fitting Response Curves and Surfaces

Chapter 7   The 2k Factorial Designs
  7.2   The 22 Design
  7.3   The 23 Design
  7.4   The General 2k Design
  7.5   A Single Replicate of the 2k Design
  7.6   The Addition of Center Points to the 2k Design
  7.7   Yates' Algorithm for the 2k Design

Chapter 8   Blocking and Confounding in the 2k Factorial Design
  8.2   Blocking a Replicated 2k Factorial Design
  8.3   Confounding in the 2k Factorial Design
  8.4   Confounding the 2k Factorial Design in Two Blocks
  8.5   Confounding the 2k Factorial Design in Four Blocks
  8.7   Partial Confounding

Chapter 9   Two-Level Fractional Factorial Designs

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[1] Moved to Eighth Edition (from Fourth) effective Spring 2016.

Any instructor should cover all of the material specified; additional sections are optional.