

BROOME COMMUNITY COLLEGE
Binghamton, New York

COURSE TITLE DESIGN OF EXPERIMENTS MAT 245

CLASS LECTURE HOURS 3 LAB HOURS 0 CREDIT HOURS 3

DIVISION DEAN William Beston

DEPT. CHAIRPERSON Mort Goldberg -DATE April 1993

PREREQUISITE: MAT 224 Statistics II

Learning objectives of Course:

The student should be able to:

1. Determine an appropriate design to fit the analysis.
2. Test hypotheses with contrasts.
3. Analyze an experiment using completely randomized designs, complete block designs, incomplete block designs, Latin square designs.
4. Develop and analyze factorial designs.
5. Use Taguchi techniques.
6. Use nested design and covariance design.

CATALOG COURSE DESCRIPTION:

MAT 245 - This course is an introduction to the most common types of statistical designs and analyses of experiments. Topics include single-factor experiments with randomized blocks, Latin squares, incomplete blocks, two-factor experiments, 2^k and 3^k designs with confounding, fractional designs, and other selected topics.

MAT 245
Design of Experiments
Course Outline

- I. Review One-Way ANOVA
- II. Fixed Effects Model, Completely Randomized Design
 - 1. Balanced design
 - 2. Unbalanced design
 - 3. Contrasts
 - 4. Transforming to stabilize variance
- III. Randomized Complete Block Design
 - 1. Statistical Analysis
 - 2. Estimating Missing Values.
- IV. Latin Square Design
- V. Incomplete Block Design
 - 1. Balanced Incomplete Block Design
 - 2. Youden Squares
- VI. Factorial Experiments
 - 1. Two-Way Classification ANOVA
 - 2. Estimating Parameters
- VII. 2^k and 3^k Factorial Designs
 - 1. The 2^2 design
 - 2. The 2^3 design
 - 3. General 2^k design
 - 4. The 3^2 design
 - 5. The 3^3 design
 - 6. General 3^k design
 - 7. Confounding in the 2^k Factorial design
- VIII. Fractional Factorial Designs
 - 1. One-half Fraction of 2^k design
 - 2. One-quarter Fraction of 2^k design
 - 3. One-third Fraction of 3^k design
- IX. Nested Designs
- X. Analysis of CoVariance
- XI. Taguchi Designs