



STATISTICS 430-3
STATISTICAL DESIGN AND ANALYSIS OF EXPERIMENTS

Fall 2001
DAY COURSE

Instructor: DR. L. WELDON

Prerequisite:

STAT 350 (or MATH 372). Students with credit for MATH 404 may not take STAT 430 for further credit.

Textbook:

Design of Experiments; Statistical Principles of Research Design and Analysis, 2nd Edition by Robert O. Kuehl, published by Duxbury Press, Toronto.

Course Description:

An extension of the designs discussed in STAT 330 to include more than one blocking variable, incomplete block designs, fractional factorial designs, and response surface methods.

Outline:

In contrast to observational studies, designed experiments can lead to unambiguous conclusions about causal factors for responses of interest. This course presents the logical principles underlying this technology, the design structures which satisfy these principles, and the methods of analysis appropriate to each class of designs. The course also discusses strategies for efficient use of resources when practical constraints make the optimal design unworkable. Students will be involved with design and analysis of experiments of their own design.

1. Research Design Principles
 2. Completely Randomized Designs
 3. Treatment Comparisons
 4. Residual Analysis
 5. Components of Variance
 6. Factorial Designs
 7. Random Effects in Factorial Designs
 8. Complete Block Designs
 9. Incomplete Block Designs
 10. Fractional Factorial Designs
 11. Response Surface Designs
 12. Selected topics from the following list, as time permit
 13. Split-plot Designs
 14. Repeated Measures Designs
 15. Crossover Designs
 16. Analysis of Covariance
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Grading:

Assignments and Projects- 50%
Midterm(s) - 10%
Final Exam - 40%

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

Revised July 2001