

Math 483 – Design and Analysis of Experiments

Course Description from Bulletin: Review of elementary probability and statistics; analysis of variance for design of experiments; estimation of parameters; confidence intervals for various linear combinations of the parameters; selection of sample sizes; various plots of residuals; block designs; Latin Squares; one, two and 2^k factorial designs; nested and cross factor designs; regression; nonparametric techniques. (3-0-3)

Enrollment: Elective for AM and other majors.

Textbook(s): Douglas C. Montgomery, *Design and Analysis of Experiments*, 5th edition, Wiley.

Other required material: None

Prerequisites: MATH 476 or MATH 474

Objectives:

1. Students will first review basic probability and statistics.
2. Students will learn the concepts of analysis of variance.
3. Students will learn how to test various hypotheses and then to follow up with kinds of confidence intervals for the difference in these means.
4. Students will learn all kinds of models, from block to nested to Latin squares.
5. Students will learn how this compares to regression.
6. Students will cover basic nonparametric statistics when the assumption of normality fails in our model.

Lecture schedule: 3 50 minute (or 2 75 minute) lectures per week

Course Outline:

	Hours
1. Review of elementary probability and statistics.	3
2. Analysis of variance for a single factor experiment.	5
3. Comparison of individual treatment means.	4
4. Selection of sample sizes.	3
5. Model adequacy including all kinds of plots of the residuals.	5
6. Nonparametric methods in analysis of variance.	5
7. Various designs such as block, nested, factorial and Latin squares.	7
8. Basic regression and how it compares to analysis of variance.	5

Assessment:	Homework	10-20%
	Computer Programs/Projects	10-40%
	Quizzes	10-20%
	Exams	40-60%
	Final Exam	20-40%

Syllabus prepared by: André Adler and Fred Hickernell

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