

Syllabus of STAT/MATH/ABE 571B **Design of Experiments**

Spring 2016

Instructor information

Dr. Lingling An
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Office Hour: 1-2pm (Wed)

Lecture: 2:00-3:15pm, Mon. and Wed., Shantz 440

A thorough and practical course in design and analysis of experiments for experimental workers and applied statisticians: SAS statistical software is used for analysis. Taken by graduate students from many fields. Previous knowledge of SAS is not required but helpful. Knowledge of regression will be helpful.

Topics include design fundamentals, completely randomized design; randomized complete blocks; Latin square; multiclassification; factorial; nested; incomplete block and fractional replications for 2^n , confounding; general mixed factorials; split plot; analysis of variance in regression models.

Goals: Learn how to plan, design and conduct experiments efficiently and effectively, and analyze the resulting data to obtain objective conclusions. Both design and statistical analysis issues are discussed. Students will be expected to utilize standard statistical software packages for computational purposes.

Textbooks (required):

Design and Analysis of Experiments by Montgomery (**8th Edition**)

Software: SAS: 6- or 12- month license is available through CatSoft at the university bookstore

Prerequisite: A good introductory course on Statistics that covers probability distributions, sampling distributions, hypothesis testing, ANOVA, and simple linear regression.

Credits: 3

Course Outline:

— Overview and Basic Principles (Chaps 1-2)

- Simple Designs and Analysis of Variance (Chap 3)
- Block Designs, Latin Squares and Related Designs (Chap 4)
- Full Factorial Designs (Chap 5)
- 2-level Full Factorial and Fractional Factorial Designs (Chaps 6-8)
- Response surface methods and designs (an overview, part of Chap 11)
- Designs with Random Factors (Chap 13)
- Nested Designs and Split-plot Designs (Chap14)

Special Needs: Students needing special accommodations or services should contact the S.A.L.T. Center for Learning Disabilities (Old Main - Rm 135 ; 621-1242) or the Center for Disability Related Resources — CEDRR (2nd and Cherry Sts.; 621-3268). These offices will verify the need for special services. Please provide us with verification no later than the second week of class so that we can help to provide the best learning environment possible.

Academic Integrity: Students are encouraged to share ideas and skills and to discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless instructed otherwise. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA Record—General Catalog.

Homework: There will be about 8 homework assignments due in class. Permission for late submissions should be obtained from the instructor in advance.

Exams: One in-class midterm exam and one final exam.

Project: One final project. Each team consists of 2 students. The report will be due the last day of class and presentation (15~20 min) will be on the last week of class.

Grading Scheme:

Homework: 35%
 Project: 15%
 Midterm exam: 25%
 Final exam: 25%.

A: 90 - 100
 B: 80 -89
 C: 70 -79
 D: 60 -69
 E: 0 - 59