

STAT 408/508 - Spring 2007
Experimental Design

Instructor:	Dr. Jane Y. Chang
Office:	365 Business Administration Building
Phone:	419-372-8683
Email:	changj@cba.bgsu.edu
Office hour:	Monday: 1:30am – 2:30pm (BA 365) Wednesday: 1:30am – 2:30pm (BA 365) Friday: 10:30 am – 11:30am (BA 365) or by appointment
Text:	Design and Analysis of Experiments, 6 th Edition by Montgomery

References:

1. *Design and Analysis of Experiments* by Dean and Voss
2. *Experiments: Planning, Analysis, and Parameter Design Optimization* by Wu and Hamada

Course Description: One-way ANOVA, Multiple Comparisons, Two-way ANOVA, K-way ANOVA, Block Designs, Row-Column Designs, Nested Designs.

Software: SAS for Windows will be used extensively throughout the course. The software is available in all BA computer labs and some other labs on campus. You may use other software you are familiar with (e.g. Minitab, SPSS, Splus, Excel) for homework. You will be expected to perform some procedures without software, some with software, and some both ways.

Course Policies

Grades: Grades will be based on 8 assignments, a group project, two midterm exams and a comprehensive final exam. The final numerical course grade will be determined according to the following scheme:

Homework (12@10 points each)	120 points
Midterm Exams (2@100 points each)	200 points
Final Exam	130 points
Group Project/Presentation	50 points
TOTAL	500 points

We will then use the following total percentage (TPCT) scale to determine the final grade:

A	B	C	D	F
$90 \leq \text{TPCT} \leq 100$	$80 \leq \text{TPCT} < 90$	$70 \leq \text{TPCT} < 80$	$60 \leq \text{TPCT} < 70$	$\text{TPCT} < 60$

(Note: grades may be revised upwards based on class participation)

Homework: Assignments are due at the start of class. Although collaboration among students for homework is acceptable (even encouraged), each student is responsible for their own work, written in their own words. **No late assignments will be accepted.** If you have to miss a class, you may turn your homework in early or send it with a friend. Tentative homework schedule:

January 17	January 29	February 5	February 12
February 19	February 26	March 19	March 26
April 2	April 9	April 16	April 23

For as many assignments as possible, work by hand and by SAS, so that you understand exactly what values SAS gives you. SAS output should be cut up and pasted into your report, and annotated where necessary. **Sheets of unannotated output will be ignored.**

Midterm Exam: Midterm exams will be given on or about **February 16 and April 6.** Exact exam date will be announced at least one week in advance. Textbook and one 8 ½" x 11" sheet (one-sided) of notes may be used. A calculator may also be used. Make-up exams will be given only to students who have a written medical excuse signed by a doctor or other health professional.

Final Exam: The comprehensive final will be given on **Friday, May 4, 8:30am-10:30am.** Textbook and Three 8 ½" x 11" sheet (two-sided) of notes may be used. A calculator may also be used.

Stat 508 Spring 2007 Tentative Course Outline:

Week	Subject	Textbook Material
January 8-12 (week 1)	-syllabus -access T:drive -DOE handout -handout (pp1-4)	Chapter 1 Chapter 2 Review Basic Statistics Chapter 3 Handout pp 1-10
January 15-19 (week 2)	-Least squared estimate, BLUE, -Gauss Markov theorem -Derive SSE, SStotal -ANOVA table -HW#1 due	Chapter 3 Handout pp 1-15
January 22-26 (week 3)	- EMS column - contrasts	Chapter 3 Handout pp 1-30
January 29 – February 2 (week 4)	- Multiple comparisons - Scheffe - Tukey - SAS program (equal/unequal) - dunnnett - MCB - HW #2 due	Chapter 3 Handout pp 23-28
February 5-9 (week 5)	- determine the sample size - 3 methods - modeling checking - normality - HW #3 due	Chapter 3 Handout pp 29-38
February 12-16 (week 6)	- constant variance - independent - outlier - one-way random effect model - HW #4 due - Exam I (2/16)	Chapter 3 Handout pp 39-43
February 19-23 (week 7)	- modeling checking - independent - one way random effect model - point estimate & CI - HW #5 due	Chapter 3 Handout pp 44-50 Chapter 13 Handout pp 51-55
February 26-March 2 (week 8)	- determine the sample size - two-way Analysis of variance - Three models - HW#6 due	Chapter 13 Handout pp 56-60
March 5-9 (week 9)	Spring Break (no class)	
March 12-16 (week 10)	-two-way Analysis of variance	Chapter 5 Handout pp 61-62
March 19-24 (week 11)	- two-way Analysis of variance - estimable function - HW #8	Handout pp 61-62
March 26-30 (week 12)	- Examples (interaction significant/non-significant) - Confidence intervals - Tukey's test for additive model	Handout pp 63-69 Chapter 5

	- HW #8	
April 2-6 (week 13)	- determine the sample size - 2-way Random effect model - 2-way mixed effect model - HW #9 - Exam II (4/6)	Handout pp 70-75 Chapter 5 & Chapter 13 Handout pp 76-92
April 9-13 (week 14)	- EMS algorithm - Block Design - Balanced Incomplete Block Design - HW #10	Chapter 13 Handout pp 93-107
April 16-20 (week 15)	- Row-column design - Nested design - HW#11	Chapter 4 Handout pp 108-112
April 23-27 (week 16)	- HW #12 - Project presentation	Chapter 14 Final project is due Friday, April 27, 5:00pm
April 30-May 4	Final Exam	Friday, May 4, 8:30am-10:30am