STATISTICS 568
DESIGN AND ANALYSIS OF EXPERIMENTS
Course Information

Instructor: Professor Doug Wiens
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Lectures: TR 2:00 - 3:20 CAB 457
Office hours: whenever I'm in my office, or by appointment

Required text

Experiments: Planning, Analysis and Optimization (2nd edition), by C.F. Jeff Wu and Michael S. Hamada.

Prerequisite material; computing

Adequate background is mathematics, and in particular linear algebra, at the level of STAT 312, design at the level of STAT 368, regression at the level of STAT 378 and statistical theory at the level of STAT 372.

For the computing we will use R, which is a statistical and numerical computing package developed and supplied, free of charge, by members of the statistical research community. It, together with manuals and the data sets used in the text, can be downloaded from the course web site

http://www.stat.ualberta.ca/~wiens/stat568/stat568.html.

This site also contains lecture notes, assignments, sample exams, R code for examples to be discussed in class, and other resources.

Look at this site soon and regularly.

Miscellany

Students who require accommodations in this course due to a disability affecting mobility, vision, hearing, learning, or mental or physical health are advised to discuss their needs with Specialized Support and Disability Services, 2-800 Students' Union Building, 492-3381 (phone) or 492-7269 (TTY).

Policy about course outlines can be found in Section 23.4(2) of the University Calendar.

Assessment

Assignments:	30%
Mid term exam:	30% (Exams are closed book, no notes)
Final exam:	40% (Three hours)
	(Deferred final exams Saturday, May 4, 9:00 - 12:00; CAB 357)

Implementing the grading system

At the end of term I will have a record of each student's raw grades for all assignments, projects and exams. I will then compute a term results summary based on these raw grades, and rank everyone in order of merit. After deciding whether the class as a whole is average, above average or below average, I shall determine what percentage of the class should fall into each of the possible grades, and assign the grades accordingly. These grades will reflect my judgements, which will be based on my assessments of both absolute achievement and relative performance in the class.

There is no pre-determined algorithm for converting raw scores to grades. However, **active participation in classroom discussions, including asking and answering questions, is expected of all students. The extent to which this has been achieved will be considered when scores are converted to grades**.

There is another benefit to class participation, beyond its intrinsic value. I am regularly asked to write letters on behalf of students who are applying for awards, or for admission to further study. If I have had no interaction with you, I can report only your grade, and that beyond that I know nothing about you. Such a letter will surely not be very helpful.

General comments

This is a graduate course in which mathematical techniques and statistical applications are blended at a relatively high level. Some possibly helpful tips:

- Rewrite your notes - the on-line lecture notes omit many important details - as soon as possible after each lecture. Writing up material in one's own words is the best way to see if the material has been understood.

- If you find that you don't understand what has gone on in class, *see me right away.* Don't start drifting from one lecture to another, understanding less each time.

- On assignments: Don't hand in your rough work! Do the assignment and then rewrite it at least once - neatly, with an adequate amount of clear explanation. The rewriting stage is the most important one for finding errors in one's work, and for deepening one's understanding of it. A description of a calculation can be more informative to a reader than the calculation itself..

<u>Tentative</u> Winter 2013 course outline; important dates

#	DATE	READ:	COMMENTS
1	T Jan 8	ch. 1 &	1.1 - 1.3; a knowledge of regression is assumed
	STAT 368 notes		
2	R Jan 10	ch. 2 &	**Single factor experiments** - Introduction
	STAT 368 notes		
3	T Jan 15	ch. 2 &	Multiple comparisons; examples
	STAT 312 notes		
4	R Jan 17	2	Sampling distributions; Random effects models
5	T Jan 22	2	Cochran's Theorem - proof
6	R Jan 24	ch. 3	Randomized blocks
7	T Jan 29	3	Latin & Graeco-Latin squares, BIBD
8	R Jan 31	3	BIBD cont'd; ANCOVA; Split plots
9	T Feb 5	ch. 4	Full factorials at two levels **Asst. 1 due**
10	R Feb 7	4	Full factorials - inferences
11	T Feb 12	4	Full factorials - blocking Take up Asst. 1
12	R Feb 14	ch. 5	Fractional factorials - construction
Feb 18-22 Reading Week			
	T Feb 26	**Midterm exam, ch. 1-3**	
13	R Feb 28	5	Fractional factorials - analysis
14	T Mar 5	5	Fractional factorials - selection and blocking
15	R Mar 7	ch. 6	Full factorials at three levels
16	T Mar 12	6	Fractional factorials at three levels
17	R Mar 14	ch. 10	Response surface methodology: example **Asst. 2 due**
18	T Mar 19	10	Response surface methodology: designs Take up Asst. 2
19	R Mar 21	ch. 11	Robust parameter design I Course evaluations
20	T Mar 26	11	Robust parameter design II
21	R Mar 28		Computer experiments - introduction & modelling
F Mar 29 - M Apr 1 Easter Weekend			
22	T Apr 2		Computer experiments - design
23	R Apr 4		Concepts of classical optimal design
24	T Apr 9		Model-robust design
25	R Apr 11		Nonlinear design - an example **Asst. 3 due**
F Apr 19 2:00-5:00 Final Exam			

PLEASE FILL OUT THIS PAGE AND RETURN IT TO ME

NAME:

DEGREE PROGRAM:

AREA OF SPECIALIZATION:

Please list the STAT and MATH courses you have previously taken. Include the names or topics of the courses, if they were not taken here.

Please list the STAT and MATH courses you are taking this year.

Why are you taking this course?