

**Stat 6750 - Research Methods in Statistics, Fall 2009**

<b>Instructor:</b>	Dr. R. N. "Herb" McGrath
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<b>Phone:</b>	(419) 372-8451 (but best to use email)
<b>Office Hours:</b>	TBD (see Blackboard)
<b>Class Meetings</b>	11:30 – 12:20 Monday, Wednesday, BAA 4000, 11:30-11:20 Friday BAA 2004

**Text**            Montgomery, D.C. (2009), *Design and Analysis of Experiments*, Seventh Edition, Wiley.

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**Prerequisite:** Stat 5080 or consent of instructor. Graduate standing.

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**Homework:**    There will be approximately 8-10 homework assignments. Each assignment will be collected at the beginning of class on the date due. Late homeworks will be penalized or not accepted at the instructor's discretion. Collaboration on homework is allowed (even encouraged). However, each student must hand in their own assignment that they created. Assignments that have been clearly copied electronically from another student and modified will result in a score of 0 for all parties involved. Unless otherwise specified, any software may be used.

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**Exams:**        There will be two midterm exams (tentatively scheduled for September 25 and October 23) and a cumulative final exam scheduled for Monday December 14, 10:45 – 12:45am. All exams will be open book and open notes and you will have access to a computer in the lab. No make-up exams will be given unless there is an official university conflict. Note the day and time of the final. You are aware of the date and time now so arrange any post-semester travel accordingly.

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**Software:** Blackboard will mainly be used in this course to post announcements, assignments, handouts, and grades. You are expected to check the site frequently (once per day during the week). Any handouts that you are expected to bring to lecture should be posted by 5:00pm the previous day.

I plan to use different software packages (SAS, Minitab, and R) during the course. You may use any software when completing assignments. However, you are responsible for understanding what the software is doing (unless otherwise specified). While the use of software may be extensive for assignments, you will not be tested on specific software usage on exams.

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**Research Project:** Each student must select one article that proposes an experimental design or method of analysis that is related to the material covered in STAT 6750. A presentation will be given to the class summarizing the article contents and a handout will be provided for each student. More details will be provided.

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**Applied Project:** Near the end of the semester, you will be asked to apply the concepts learned in the course to optimize a process. You will be given a “budget” and asked to use experimentation to suggest the optimum settings for a process with several factors. This will all be done using software and a written report will be submitted. More details will be provided.

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<b>Grading Weights:</b>	Homework	15%
	Midterm Exam 1	15%
	Midterm Exam 2	15%
	Research Project	15%
	Applied Project	15%
	Comprehensive Final Exam	25%

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## Tentative Course Outline

The topics covered and the order in which they are covered are subject to change. I have no doubt that we will not follow this exactly. Substantial changes will be posted in Blackboard.

<b>Tentative Dates</b>	<b>Topic</b>	<b>Textbook Material</b>
Aug. 24-26	Review of regression and design basics	Chapters 1-5
Aug. 28 - 31	$2^2$ Location and dispersion effects	Section 6.2, non-text material
Sept. 2 - 9	$2^k$ factorial designs	Sections 6.3 – 6.4
Sept. 11 - 16	Unreplicated $2^k$ factorial designs	Sections 6.5 – 6.6
Sept. 18	Center points	Section 6.8
Sept. 21 - 23	Blocking in $2^k$ fractional factorial designs	Chapter 7
Sept. 25	<b>Midterm 1</b>	<b>Chapters 6 and 7</b>
Sept. 28 - 30	$2^{k-1}$ fractional factorial designs	Sections 8.1-8.2
Oct. 2 - 5	$2^{k-p}$ fractional factorial designs	Section 8.3 – 8.5
Oct. 7 - 9	Resolution III designs and foldover	Section 8.6
Oct. 14	Resolution IV and V designs	Section 8.7
Oct. 16	Supersaturated designs	Section 8.8
Oct. 19 – 21	Some other stuff	
Oct. 23	<b>Midterm 2</b>	<b>Chapters 7 and 8 and some other stuff</b>
Oct. 26 – Nov. 4	Response surface methodology	Chapter 11
Oct. 6 - 13	Robust design	Chapter 12

Oct. 16 - 23	Miscellaneous	
Nov. 30 – Dec. 11	<b>Research Project Presentations</b>	
Dec. 14	<b>Final Exam (Monday December 14, 10:45-12:45)</b>	<b>All of the above</b>