SYS 595 "Design and Analysis of Experiments"

Course Objectives

- Understand the fundamental objectives and methods of experimentation
- Apply experimental design techniques to ensure analyzable data
- Apply statistical methods in analysis of data
- Interpret results and draw conclusions from designed experiments and their analysis

Resources

Textbook

- REQUIRED: Montgomery, Douglas (2013) – Design and Analysis of Experiments. 8th Edition. John Wiley and Sons, Inc. ISBN 978-1-118-14692-7
- RECOMMENDED: Montgomery, Douglas (2013) – Minitab Manual for Design and Analysis of Experiments. 8th Edition. John Wiley and Sons, Inc. 978-1118342275

Software

- Minitab if you do not already have Minitab version 16, for this course it is required and can be purchased with an academic discount for 6 months at www.onthehub.com/minitab
- Microsoft Office (Adobe Reader, Word, Powerpoint, and Excel)
- Compatibility with Blackboard Collaborate

Course Structure

- This is an online offering of SYS595. The online course is structured differently than the in class offering but is intended to achieve the same learning objectives.
- The online course is broken up in to one week modules associated roughly, with the chapters of the course text book or other reading materials.
- Each week will include a combination of recorded lecture, reading, homework exercises, and participation in a threaded discussion.
- Lecture material for the week will be posted in the form of a multi-media file in each week's section.
- The week's discussion topic will be introduced within the recorded lecture. If you have not previously used Moodle, please see the student tutorials.

Course Grading

Grades will be based upon the following:

- Homework – 25%
- Mid-term – 25%
- Final Exam – 30%
- Participation – 20%

Homework

Homework is assigned and due weekly from the textbook or separately posted exercises, it is graded based upon timeliness and thoroughness of attempt. No extensions will be given.

Participation

This grade will be based upon the threaded discussion participation of each student. The more thoughtful and complete your discussions the higher the grade. Simply answering each question weekly but not engaging in a discussion is inadequate.

Final Exam and Mid-Term
The final exam and mid-term will be a "take home" and "open book" in nature.

Course Outline

Week of	Week	Topic	Reading	Assignment (due Friday of each week)
21-Jan	1	Introduction	Ch. 1	Probs. 1.1, 1.2, 1.3
27-Jan	2	Statistical Intro/refresher	Ch. 2.1-2.4	
3-Feb	3	Comparative Experiments	Ch. 2.5 -2.6	Probs. 2.20, 2.26, 2.27
10-Feb	4	Correlation and Regression	Ch. 10	Probs. 10.1, 10.7 a & b
17-Feb	5	Single Factor Experiments	Ch. 3	Probs. 3.7, 3.8, 3.9
24-Feb	6	Factorial Designs	Ch. 5-6	Probs. 5.3, 5.4, 5.5
3-Mar	7	Fractional Factorial	Ch. 8	Probs. 8.1, 8.2, 8.3
10-Mar	-	Spring Break week		Mid-term Due
17-Mar	8	Three and Mixed-level Designs	Ch. 9-10	Probs. 9.1, 9.3, 9.4
24-Mar	9	Response Surface Methods	Ch. 11	Prob. 11.1
31-Mar	10	Taguchi based Designs	Ch. 12	none
7-Apr	11	Intro to LP Optimization	none	Posted Assignment
14-Apr	12	Measurement Systems Evaluation	none	Probs 13.1, 13.2, 13.3
21-Apr	13	Introduction to Statistical Process Control	none	Final due 25-April