Statistics 503: Design of Experiments
Course Syllabus
Fall 2013 -- World Campus

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Course materials will be distributed through ANGEL at <cms.psu.edu>.
Course related email should be sent through ANGEL communication.

Course Requirements:
10 Homework assignments graded. 30% (10% penalty for late assignments)
Experiment design and analysis Project. 10% (due last week of class)
Two preliminary examinations. 20% each.
Comprehensive final examination. 20%


Coverage: The course will cover most of the material in the text, chapters 1-15.
The students will be required to use statistical computer software to complete many homework assignments and the project. For the analysis of experiments, we will use ANOVA and the General Linear Model, which builds on the multiple linear regression and the use of indicator or ‘dummy variable’ concepts learned in Stat 501.

For most assignments the Minitab GLM command will satisfy the computing requirements. The Minitab Design of Experiments (DOE) commands are also utilized extensively. For a few examples we will use SAS Proc GLM and Proc Mixed to demonstrate the analysis, however students do not need to have SAS available for this course.

Lesson Topics:
1. Introduction - Design Principles
2. Simple Comparative Experiments
3. Single Factor experiments
4. Randomized Blocks, Latin Square Designs and extensions
5. Introduction to Factorial Designs
6. Two level, $2^k$, Designs
7. Confounding and Blocking in $2^k$ Designs
8. 2-level Fractional Factorial Designs
9. 3-level and Mixed-level Factorials and Fractional Factorials
10. Regression models
11. Response Surface Methodology
12. Robust Parameter Designs
13. Random and Mixed Effects Models
14. Nested and Split Plot and Strip Plot Designs
15. Repeated Measures Designs

References (optional for additional reading):

Integrity Policy Notice:
All Penn State and Eberly College of Science policies regarding academic integrity apply to this course. See: http://www.science.psu.edu/academic/Integrity/index.html and the University Policy: http://www.psu.edu/dept/ufs/policies/47-00.html#49-20 for details.

Proctored Final Exam:
The final exam will require a proctor. The exam will be open Dec. 12-17. You will have 3 hours to take the exam. You must sign up for a course proctor.

Disability Policy Notice:
Penn State welcomes students with disabilities into the University’s educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at http://equity.psu.edu/ods/

In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see the documentation guidelines at http://equity.psu.edu/ods/guidelines/documentation-guidelines). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible.
You must contact ODS and request academic adjustment letters at the beginning of each semester.

**Eberly College of Science Code of Mutual Respect:**
I also recommend everyone follow the code of mutual respect developed by our Climate and Diversity Committee: [http://science.psu.edu/climate/code-of-mutual-respect-and-cooperation](http://science.psu.edu/climate/code-of-mutual-respect-and-cooperation)