Statistics 503: Design of Experiments
Course Syllabus
Fall 2014 – University Park

Location: 203 Willard Building Time: Monday and Wednesday 9:05 - 9:55am
Location: 004 Life Sciences Bldg Time: Friday 9:05 - 9:55am.

Professor: James L Rosenberger
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Office Hours: Wednesday 2:30-4:00pm, and by appointment at 323F Thomas Building.
(call or email for appointment)

Teaching Assistant: Eduardo Santiago   Email: eus146@psu.edu
Office Hours: (email for appointment).

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

Course Requirements:
12 Homework assignments counted. 36% (10% penalty for late assignments)
Experiment design and analysis Project. 14% (due last week of class)
Two preliminary examinations. 15% each.
Comprehensive final examination. 20%


Coverage: The course will cover most of the material in the text, chapters 1-15. Students will be required to use statistical computer software to complete many homework assignments and the project. For the analysis of experiments, ANOVA and General Linear Model, which builds on the multiple regression 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.

Syllabus: Preliminary order of material.
1. Introduction - Design Principles
2. Simple Comparative Experiments
3. Single Factor experiments
4. Randomized Blocks, Latin Square Designs and extensions
5. Introduction to Factorial Treatment 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. Transformations, ANCOVA and 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.psu.edu/dept/ufs/policies/47-00.html#49-20 and http://www.science.psu.edu/academic/Integrity/index.html for details.

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. 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.

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