Course Design and Analysis of Experiments

Objectives To learn how to plan, design and conduct experiments efficiently and effectively, and analyze the resulting data to obtain objective conclusions. Both design and statistical analysis issues will be discussed. This course is intended primarily for graduate students in the Department of Statistics, but qualified students from other programs are welcome.

Lecture 11:15am—12:05pm Monday, Wednesday & Friday Room 220 Thomas Building

Design and Analysis of Experiments, 8th Ed. (2013, by Montgomery)—optional
Statistics for Experimenters, 2nd Ed. (2005, by Box, Hunter & Hunter)—optional
Minitab, Excel or JMP (optional)

Instructor Dennis K. J. Lin, University Distinguished Professor 317 Thomas Building 865-0377(phone), 863-7114 (fax) DennisLin@psu.edu (e-mail) Office Hours: 10:00am—11:00am, Mon & Wed (or by appointment)

Teaching Assistant Mr. Cheng You 330B Thomas Building, 814-863-0692, czy112@psu.edu Office Hours: 1:30P—2:30pm, Wed & Thursday (or by appointment)

Course Grade Quizzes 10% Every Friday (from Jan 22nd)
Homework 10% Bi-weekly due Friday
Course Project 15% Due April 11th, Monday
Project proposal due February 12th.
First Exam 20% February 19th, Friday
Second Exam 20% March 25th, Friday
Final Exam 25% To Be Announced (likely April 29th)

Other course information will be distributed through ANGEL at <www.cms.psu.edu>
Preliminary Order of Materials

1. Introduction—What’s Statistics All about and Design Principles (WH-1 & M-2)
2. Basic Statistical Concepts—point estimate, confidence interval and hypothesis testing (WH-2)
3. Two-Level Full Factorial Designs (WH-4 & M-6)
4. Two-Level Fractional Factorial Designs (WH-5 & M-8)
5. Three-Level and Mixed-Level Fractional Factorial Designs (WH-6 & 8 & M-9)
6. Linear Model and Optimal Design (new)
7. Response Surface Methodology (WH-10 & M-11)
8. Robust Parameter Design and Quality Assurance (WH-11 & 12, M-12)
9. Experiment with Single Factor: k-treatment & ANOVA (WH-3 & M-3)
10. Randomized Block and Latin Square (WH-3, M-4)
11. Design for Computer Experiment (new)
12. Nested and Split-Plot Designs (WH-3 & M-14)
13. Experiments with Random Effect Factors (M-13)
15. Screening Experiment (Supersaturated Design and Group Screening)

General Course Policies:

1. Quizzes are 15 minutes long (at the end of Friday Lecture), Exams #1 & #2 and Final Exam are 50 minutes long (during the regular Friday lecture time).
2. All tests are open book; meaning, textbook, class notes, calculator, etc, can be used.
3. No late assignment will be accepted. No makeup quiz for whatever reason.
4. Grading errors (quizzes, Exams etc) should be noted in writing and this should be done within 7 (seven) days from the date on which it was returned. Your failure to pick up quiz or exam does not extend this deadline, unless the cause was a lengthy medical, family emergency or religious/cultural issues, in which case you MUST contact Dr. Lin (in advance, whenever possible).
5. Attend All Classes. Experience shows that there is a high correlation between class attendance and exam performance. If you must miss, it is your responsibility to check the course website, your classmate or TA for material and announcement you’ve missed.

Academic Integrity:

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 for details.
A Message from President’s Office

Special Fall 2009 Flu Protocols - In compliance with Pennsylvania Department of Health and Centers for Disease Control recommendations, students should NOT attend class or any public gatherings while ill with influenza. Students with flu symptoms will be asked to leave campus if possible and to return home during recovery. The illness and self-isolation period will usually be about a week. It is very important that individuals avoid spreading the flu to others.

Most students should be able to complete a successful semester despite a flu-induced absence. Faculty will provide students who are absent because of illness with a reasonable opportunity to make up missed work. Ordinarily, it is inappropriate to substitute for the missed assignment the weighting of a semester's work that does not include the missed assignment or exam. Completion of all assignments and exams assures the greatest chance for students to develop heightened understanding and content mastery that is unavailable through the weighting process. The opportunity to complete all assignments and exams supports the university's desire to enable students to make responsible situational decisions, including the decision to avoid spreading a contagious virus to other students, staff, and faculty, without endangering their academic work.

Students with the flu do not need to provide a physician's certification of illness. However, ill students should inform their teachers (but not through personal contact in which there is a risk of exposing others to the virus) as soon as possible that they are absent because of the flu. Likewise students should contact their instructors as quickly possible to arrange to make up missed assignments or exams.

For health-related questions you can email Dr. Margaret Spear, director, University Health Services, at uhsinfo@sa.psu.edu.

Eberly College of Science Climate Committee

The Eberly College of Science Code of Mutual Respect and Cooperation


embodies the values that we hope our faculty, staff, and students possess and will endorse to make The Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.