Statistics 514: Design of Experiments – Spring 2013

Course Information and Policies
Division 1 – MWF 1:30pm-2:20pm (REC 227)

Instructor: Dr. Min Zhang

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Prerequisite: This course is effectively a continuation of (not a substitute for) STAT 512. Much of the preliminary information will be considered a quick review of the material covered in that class. While it is not recommended that you take this course without taking STAT 512, you should absolutely not take this course without having taken a good introductory course in statistics covering probability distributions, sampling distribution, sample mean, variance, hypothesis testing, \( Z \)-test, \( t \)-test, two-sample paired \( t \)-test, two-sample independent \( t \)-test, one-way ANOVA, and simple regression.

Course Objectives: To be able to plan an experiment in such a way that the statistical analysis results in valid and objective conclusions. To learn a variety of experimental designs and be able to choose an appropriate design for a specific experiment. To be able to perform the proper statistical analysis and draw valid conclusions from a specific experiment.

Computer Software: We will use the SAS statistical software (version 9.2) on Windows personal computers. The intent of using software is to allow the computer to perform routine calculations and graphing, while we focus on choosing the appropriate analysis tools and interpreting the results. Computer software is NOT a substitute for understanding the statistical methods, and you will not have access to a computer during exams. SAS is available in the Purdue computing labs. You may also obtain a copy of SAS for your own PC for class purposes free of charge by showing your student ID at ITaP Customer Service Center located in Young Hall, 5th floor. More information on SAS are posted on the course web page.

Mailing List: A mailing list has been arranged for this course. I will send e-mail to this list with any special announcements or reminders.


Course Outline:
• Overview and Basic Principles
• Simple Designs and Analysis of Variance
• Block Designs, Latin Squares and Related Designs
• Full and Fractional Factorial Designs
• Experiments with Random Factors
• Nested and Split-Plot Designs

Homework: There are about 11 homework assignments. Homework will be due Wednesdays at the beginning of class, and the assignments will be posted on the web one week before their due date. An answer key will be made available on the web after class and any homework turned in afterward will not receive credit. Exceptions may be arranged if discussed in advance.

Please include only the printouts that are directly relevant to your answers and do not pad your homework with endless SAS output. Homework must always be stapled if it is longer than one page. The first page of each homework set handed in must contain the following information: your name, division number (1 or 2), the number of the homework set (e.g., Homework #2), and STAT 514.

Re-grades: Since the professor and grader are fallible human beings, occasionally errors will occur in grading. For this reason, students are able to request that such an error be corrected. Two types of error can occur. A type I error occurs if points are deducted for a correct solution. A type II error occurs if sufficient points are not deducted for an incorrect solution. Any request for a re-grade must be made in writing with a detailed explanation of the suspected error (“Please look at problem 4” is not considered a detailed explanation) and submitted within a week, or it will be ignored. Please note that a re-grade request is different from the questions “Can you help me figure out what I did wrong here?”, or “I don’t understand the posted solutions”, which are entirely appropriate for office hours.

Final Grade: Your final grade will depend on the following components with these proportions: homework (20%), midterm I (20%), midterm II (20%), final (40%). Your final grade will be determined by taking your received percentage to the following scale: [90, 100]=A, [80, 90)=B, [65, 80)=C, [50, 65)=D, below 50=F.

Web Page: The URL of the course website is http://www.stat.purdue.edu/~minzhang/teaching.html. It contains links to all the course materials, which are Course Information, SAS Files, Lecture Notes, Homework, Datasets, and Others. Some links are briefly described below.

• Lecture Notes usually are .pdf files. They will be posted before lecture.

• Homework contain homework assignments and solutions.

• SAS Files contain important .sas programs which are used in class and can serve as templates for homework.
Datasets contain .dat files which are data sets in plain text format.

Others contains articles that are further expositions of some concepts discussed in class and exam materials.

To download a .sas program or a .dat file, just click the file name, then click Save this file to disk and navigate to the directory when you keep your SAS work. When you use a ITaP computer, make sure to use either your home directory (H: drive) or an external disk, otherwise your work will be deleted after you log off.

**Academic Integrity Statement:** Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor. In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. “Proper attribution” means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis.

As a general rule, if you are citing from a published source or from a web site and the quotation is short (up to a sentence or two) place it in quotation marks; if you employ a longer passage from a publication or web site, please indent it and use single spacing. In both cases, be sure to cite the original source in a footnote or in parentheses. If you are not clear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor beforehand.

Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. So be proud of your academic accomplishments and help to protect and promote academic integrity at Purdue. The consequences of cheating and academic dishonesty - including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school - are simply not worth it.

**In the Event of a Major Campus Emergency:** Course requirements, deadlines and grading percentages are subject to change that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Here are the ways to get information about changes in this course: course web page, instructor’s email, and instructor’s phone.