Statistics 112
Introductory Statistics (II)
Spring 2009

Professor: Howard Wainer
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Class Time: Tue & Thu, 3:00-4:20pm   **Classroom**: JMHH 245
Office: 3750 Market Street (Rm. 432)
Office Hours: Tue and Thu, 4:30-5:30 pm and by appointment
Telephone: 215-590-9861

Teaching Assistant: Shaun Lysen
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Office Hours: Wed 10am-12pm

Course website:

http://www-stat.wharton.upenn.edu/~slysen/stat112

Course Description:
Introduction to statistics (II). Second course in statistical methods and data analysis for the behavioral sciences. The main topics are regression, analysis of variance and experimental design.

Objectives: The objectives of this course are:
*   To understand how statistics contributes to a fundamental goal of science – causal inference.
*   To learn about modern tools for data exploration, and how they came to be.
*   To understand distinctions between various types of studies (e.g., observational studies, controlled

experiments), the questions they can address and what types of statistical methods are appropriate for analyzing them.

- To learn some of the basic statistical tools used to analyze data: regression and analysis of variance.
- To get hands-on experience reasoning from data
- To gain experience in interpreting the results of a statistical analysis and communicating the results to others.

Stat Lab (drop in statistics help):

The Stat Lab is open Monday-Friday for help with statistics questions. The Location is Huntsman Hall, room F96. The hours are

- **Mon-Thurs: 3:00 pm – 6:00 pm**
- **Fri: 11:00 am – 5:00 pm**

Exam Dates:

- **Midterm I:** Thursday March 5, 3:00pm-4:20pm (in class)
- **Midterm II:** Tuesday April 7, 3:00pm-4:20pm (in class)
- **Final Exam:** Wednesday May 5, 12-2pm.

Prerequisites: Stat 111 or equivalent

Texts:

Required:

- *Introduction to the Practice of Statistics* (5th Ed.), by D.S. Moore and G.P. McCabe, 2005, W.H. Freeman and Company, ISBN: 0-7167-9657-0.

Recommended:

- *Graphic Discovery*, by Howard Wainer, 2005, Princeton University Press, ISBN: 0-691-10301-1.

May also be valuable:

- *Visual Revelations* (2nd edition), by Howard Wainer, 2000, Lawrence Erlbaum Associates, ISBN: 0-8058-3878-3.
- JMP Start Statistics: A Guide to Statistics and Data Analysis Using JMP and JMP IN Software (3rd Ed.), by J. Sall, A. Lehman and L. Creighton, 2005, SAS Institute Inc., Duxbury Press. ISBN: 0-534-99747-3 (JMP IN Version 5, the software); 0-534-99749-X (JMP Start Statistics, the handbook).
- JMP Manual for Moore and McCabe's Introduction to the Practice of Statistics, by T. Devlin, 2003, W.H. Freeman and Company. ISBN: 0-7167-9631-7.

Lectures and Readings:
*   The lectures are used to present the basic ideas. Students are responsible for both the material covered in lecture and the assigned reading in the textbook.

Computing/Software:

Students will be required to perform statistical analyses in this course, and JMP IN (version 7 is one useful package. There are others. Students are free to use whatever statistical package they find most helpful

The JMP IN software is available at Wharton Computing Labs (F75 and F80 Huntsman Hall, also basement of SH-DH). In order to use Wharton computing facilities you need to apply for an account at F35 Huntsman Hall with your ID. But, if possible, I would recommend that you buy the software since there is a nice handbook to JMP that goes with the software and it would be more convenient to use JMP IN on your own computer. You can do this by downloading JMP 7 at www.e-academy.com

<http://www.e-academy.com> (6 months at $29.95 or 12 months at $49.95)

Homework:

- There will be weekly homework assignments. Homework will be assigned at lectures, usually on Thursday and due the following Thursday at the beginning of class.
- Although you are encouraged to discuss the homework problems with other students (and with the instructor and TA of course), you must write your final answer yourself, in your own words. Solutions prepared "in committee" or by copying, paraphrasing, or summarizing someone's else's work are not acceptable.
- **No late homework will be accepted for full credit except in the case of serious illness or a major family crisis (the same policy will be followed with regard to excuses as the policy described below for exams). Homework that is handed in late will typically be given diminished credit.**

Exams:

- There will be two midterms (part in-class and part take-home) and a final exam.
- There will be occasional unannounced in-class quizzes based on the readings and assignments for that day.
- In the unlikely event that you have a conflict with a midterm or final, you must notify me at least 2 weeks in advance.
- All students must use a pen to write the exams. Use of pencil voids the student's right to request a regrade of the exam.

- The exams will be open book. You will need a calculator for all exams. All necessary tables required to solve problems will be provided.
- The only excuses for missing an exam are: a serious illness or a major family crisis. You must provide proof in the form of an official document. A note from a family member is not sufficient. To be clear -- To prove that you are seriously ill, you need to have a note from a PENN physician documenting that you could not take the particular exam. A note from a physician saying that you were seen for a problem is not sufficient. Minor illness or problems are not acceptable to be excused from a exam. Colds, sinus problems, upset-stomach, slight fever, etc. are not valid reasons for missing an exam. There are no makeup exams. If you miss an exam and do not have a valid excuse as described above, you will receive a ZERO for that exam.

Grading/Regrading Policies:
- Your final grade will be based on: 20% homework, 20% for each midterm and 40% final.
- Any dispute arising in grading of homeworks and exams should be submitted in writing. This letter should clearly state the question(s) where you think there has been a grading error and what you think that error is. Note that upon resubmission the entire exam or homework may be regraded and not just the disputed question.
- No regrades will be accepted for exams written in pencil.
- There is a one-week time limit for submission of disputes for both exams and homeworks. The one-week limit starts from the day the homeworks/exams have been returned in class. If you are not present in class when

they are returned, it is your responsibility to collect them.

- For the final, each student is given two weeks from the beginning of the new semester to submit any written request for re-grading. No requests will be entertained after the two-week deadline has passed.

NOTE: The instructor reserves the right to make any changes he considers academically advisable.