

Math 1281

Applied Statistics

Syllabus

Fall 2007

Instructor: Sam Smith, Mathematics

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Office Hours: Mon 12:00-1:00, 2:15-3:15, Tues. 1:00-2:00, Thurs. 2:15-3:15
or by appointment.

Text: David Moore, *The Basic Practice of Statistic*, 4th edition, W.H. Freeman, 2007

Course Description: This course will be an introduction to statistics, the science of interpreting data. Our first focus will be on descriptive statistics or data analysis. We will learn many ways to display data and the basic measurements which describe it. In this context, we will make use of the statistical package SPSS to get hands-on experience with actual data sets. We next take up the topic of probability and its relationship to statistics. Among other topics, we will consider conditional probability and the binomial probability distribution. Our main goal for the course will be to understand the basic techniques and results of inferential statistics. Here the goal is to draw conclusions about a large population by sampling smaller groups. The theoretical underpinning for inferential statistics is probability theory. Students will complete a research project using SPSS which will bring together the various techniques of the course. We will cover the following sections of the text: Part I : Chapters 1 – 7, Part II: Chapters 8 -17, Part III: Chapters 18, 19, Part IV: Chapters 23,25 (if time permits)

Student Learning Objectives:

After completing this course, successful students will be able to:

- explain how data is collected and collect their own data sets
- effectively summarize data using graphical displays, and interpret data and draw conclusions based on graphical displays of data
- relate probability and uncertainty to real data sets
- select the appropriate statistical methods to analyze a data set and use technology to obtain the results
- explain clearly, both orally and in writing, how the results of statistical analyses relate to the context from which they were obtained
- think critically about data
- demonstrate the ability to use statistics to answer questions and make informed decisions about issues that arise in their everyday life and in the life sciences

Course Structure: Your responsibilities for this course are: two exams, four quizzes, two computer lab assignments, the in-class assignments (see below), the research project and the final exam. The dates for these are indicated on the attached course calendar except for the in-class assignments which are unannounced and the final exam which is as scheduled by the registrar.

Grades: I will determine final course grades by curving your total scores, out of a possible 800 points, computed as follows: The two tests will be worth 100 points and the final exam 200 points. Class attendance, class participation and the in-class homework assignments will total 40 points. The quizzes will be worth 40 points, the labs 50 points each and the research project will be worth 100 points.

Homework: You are expected to read the sections in the text indicated on the calendar below before each lecture *and* to work exercises in the text for practice after each lecture. There are exercises at the end of each section and the answers to the odd-numbered problems are in the back of the book. You should work the problems corresponding to the topics covered in lecture before the next class meeting. I will not grade these problems directly, but they will be the subject matter for the tests and quizzes. I will frequently work on homework problems as part of the lecture and will be happy to discuss any problems you might like to see.

The Computer Component: We will make use of the statistical package SPSS (a CD version comes with the text) to aid our study of descriptive statistics. You will use SPSS for the two lab assignments and for your research project, as well.

The Research Project: The Research Project is intended to allow students to devise and carry out their own statistical study. You may work alone or with a partner. In the latter case, both members of a group receive the same grade for the project. Your assignment is to conduct a statistical analysis using techniques and ideas from class. You will define the study you wish to undertake and your goals for the study. You will then collect the data, analyze it using SPSS and techniques from class and write up a report with your conclusions. I will hand out a more detailed description of the project in February.

Class Attendance and In-Class Homework You are expected to attend every class period and to participate actively in the discovery of the ideas and concepts of the course. At the end of the semester, I will give each student a score worth 30-40 points based on their class attendance and participation. Also, periodically (roughly, 4-5 times during the semester) I will give out an In-Class Assignment which will cover the preceding day's lecture topic. You will have the remainder of the class period to work with a group on the assignment sheet and you may hand the assignment sheet in at the next class. However, **you cannot hand in an assignment if you weren't in the class when it was assigned.** Also, **I will not accept late assignments.** Thus the in-class homework assignments will function as an attendance check as well.

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Course Calendar**

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Tuesday	Thursday
Aug 28 Read Chapters 1,2	Aug 30
Sept 4 Read Chapters 3, 4	Sept 6 Quiz 1
Sept 11 Read Chapters 5, 6, 7	Sept 13
Sept 18 Read Chapters 8, 9	Sept 20 Lab Assignment 1 Due
Sept 25 Read Chapter 10	Sept 27 Quiz 2
Oct 2 Read Chapter 11	Oct 4
Oct 9	Oct 11 Midterm Exam
Oct 16 Fall Break -- No Class	Oct 18
Oct 23 Read Chapters 12, 13	Oct 25
Oct 29 Read Chapter 14	Nov 1 Quiz 3
Nov 6 Read Chapter 15	Nov 8 Lab Assignment 2
Nov 13 Read Chapters 16, 17	Nov 15 Quiz 4
Nov 20 Read Chapter 18	Nov 22 Thanksgiving -- No Class
Nov 27 Read Chapter 19	Nov 29 Second Exam
Dec 5 Read Chapters 23, 25	Dec 6
Dec 13	Final Exams