

Statistics 1040
Dr. McGahagan
Spring 2011 -12
Biddle 124, MWF 11-11:50

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Statistics for Business and Economics

Prerequisites: Students are expected to have mastered basic algebra -- graphs, linear equations, operations with fractions, percentages, and inequalities will be used frequently in this course.

Textbook: David Freedman, Robert Pisani and Roger Purves. *Statistics*. **3rd edition**. Norton, 1997.
There are extensive problems after each section of the text and review problems at the end of each chapter. Do as many as possible – and think about the procedures involved – and you can expect to do well on the exams. The course web page will note the most important of the problems, and provide worked solutions for many of the review problems.

Supplementary material: Philip B. Stark, *SticiGui*, <http://www.stat.berkeley.edu/~stark/SticiGui/>
STICI = Statistics Tools for Internet and Classroom Instruction with a GUI
Skip Chapters 1 and 2 of Stark, but do read Chapters 3 and 4 right away.
Michael Wichura has very useful handouts for a course based on Freedman, Pisani and Purves at <http://www.stat.uchicago.edu/~wichura/Stat200/handouts.html>
I strongly advise using the Wichura handouts to test your knowledge of the material.

Computer program: We will be using the R statistical language in this course. It is freely available for Windows, Mac and Linux. While students will not be asked to program extensively, they will be expected to master the basic usage of the program, use it in assignments, and answer questions relating to it on exams.

Course description

Statistics provides us with the tools to **describe** enormous amounts of data concisely, and to **think about** what the data means. The two basic branches of statistics are accordingly **descriptive statistics** and **inferential statistics**. The first two chapters introduce you to the types of data (experimental, observational, discrete, continuous, qualitative, quantitative) and the need to reason rigorously about the data (controlled experiments).

You have probably met the basic concepts of **descriptive statistics** (such as the mean, median, mode, variance, standard deviation and skewness) before, and we will review them and make them more precise. (Text, Part II, chapters 3-7; Stark, chapters 3-4). We will also begin presenting the data graphically as well as mathematically, with the assistance of a computer program which will be provided to you.

Inferential statistics, which tells us what conclusions can be drawn on the basis of the data, will take up the bulk of the course. **Correlation** and **regression** are the most commonly employed tools in examining the relation between different sets of data. (Text, Part III, chapters 8-12, Stark, chapters 5-8). To understand how accurate our conclusions are likely to be, we must master the basic concepts of probability (Text, Part IV, chapters 13-15, Stark, chapters 9-10 and 14-17. We will probably omit Stark, 11-13) and apply them to the **chance variability** of the data we are likely to meet (Text, Part V, chapters 16-18, Stark, chapters 17-20).

Since any data we have to work with is likely to be a **sample** of the all the data available (the "population", even if we are talking about things rather than people), we must worry about the accuracy of averages or percentages computed on the basis of the sample (Text, Part VI, chapters 19-23, Stark, chapters 21-23). Note that part VII (chapters 24-25) will not be covered. If time permits, we will also take a look at tests of significance (Part VIII; I doubt that we will have time for more than chapter 26 from this section, and possibly Stark, 24-25).

There will be **three exams** in term, with tentative coverage and very tentative dates as follows:
–**descriptive statistics**, Text 3-7, Stark 3-4 (Friday, 27 January)
–**correlation and regression**, Text 8-12, Stark, 5-8 (Wednesday, 1 March)
–**probability concepts**, Text 13-18, Stark 9-10, 14-20 (TBA)
Questions on the R statistical language and its use in class will be asked on each of these exams and on the final.

The **final exam** will be comprehensive, but will stress the probability unit and the final unit on sampling and hypothesis testing. It will be held in the regular classroom, on Monday, 23 April.

Grading

Your grade will reflect your performance on the four examinations in the course, and will also take into account class participation and improvement or deterioration of your performance over the term. Improving performance may lead me to give greater weight your best performances in computing your course grade. Details on my usual procedure for computing grades are available on my web page.

The final exam will receive 1.5 times the weight of any in-term exam in computing your examination score. Note that for any grade higher than a D in the course, you must pass the final and pass at least two of the in term exams. Students must have a passing average on their top two in-term exams to pass the course; if you do not have a passing average on your top two exams, you will not be permitted to take the final.

Note that exams will not always permit the use of a calculator. When they do, the calculator may not be of a format which may be used to communicate with outside (that is, cell phones) or of substantial computing power (greater than a HP-12C). Using such devices is prohibited, and will lead to a zero on the exam.

Attendance and class participation

Attendance is expected. Roll will be taken, and your grade will be reduced by a full letter grade for each absence in excess of three. Any prolonged absence (two or more classes in a row) requires an excuse from the Associate Vice President for Academic Affairs (Owen Library, 269-2078).

It is your obligation when absent to send me an e-mail, with the subject header “Statistics – class absence” and an explanation of that absence. More than 9 absences, whether excused or unexcused, means that such a large portion of the class has been missed that I cannot in good conscience give you a grade other than a failing grade for the course unless there are truly extraordinary circumstances, confirmed by the AVPAA.

Class participation also requires avoiding not only major disruptions to the class, but minor disruptions such as late arrival (more than 5 minutes late will be counted as an absence), use of cell phone or other electronic devices (including texting) and repeated leaving of the classroom during the class session, or inappropriate conversation. You will be asked to leave the classroom and be considered absent for any class session in which I find your behavior inconsistent with reasonable class participation. If you are asked to leave, the absence will double-count in computing its impact on your grade.

Accommodation for Students with Disabilities

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the Office of Health and Wellness, G-10 Student Union Building, 269-7119 to schedule an appointment as early as possible. That office will verify your disability and determine reasonable accommodations for the course..

Add/Drop

The period to add or drop a class will end on January 17. Any student wishing to add or drop after that date must have my approval and the approval of the Associate Vice President for Academic Affairs.

Incomplete grades

Incomplete grades will not be given in this class except in truly extraordinary circumstances, and with the permission of both the instructor and Vice President for Academic Affairs. If permission is given, the work for the course must be completed within the time set by the instructor, which will in no case extend longer than one semester.