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**Economics 102A**  
**Stanford University**  
**Fall 2009-2010**

**Instructor:** Faye Steiner  
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## **ECON 102A:**

### **INTRODUCTION TO STATISTICAL METHODS FOR SOCIAL SCIENTISTS**

#### **COURSE OVERVIEW AND OBJECTIVES**

Economics is an inexact science: people, firms, and markets behave in ways that are only imperfectly predictable. In this course, we will explore some of the statistical methods economists use for analyzing these imperfectly-predictable agents and phenomena.

Econ 102A comprises the first half of the “statistics and econometrics” portion of the Stanford Economics Department’s undergraduate core curriculum. After completing Econ 102A, most of you will wish to proceed to Econ 102B in order to refine and expand your understanding of the statistical and econometric methods used in economic research. For those of you who do not plan to major in economics, Econ 102A may serve as a stand-alone introduction to statistical techniques that are widely used throughout the social sciences.

#### **PREREQUISITE: MATH 41 OR EQUIVALENT REQUIRED; ECON 1 STRONGLY RECOMMENDED**

Unlike many introductory statistics courses, Econ 102A makes use of differential and integral calculus. Some familiarity with multivariate calculus will be useful. Some of our homework assignments will require the use of Microsoft Excel or a similar spreadsheet program.

#### **COURSE ORGANIZATION**

Lectures will be held in building 320-105, on Mondays and Wednesdays from 2:15 to 4:05 pm. It is very important that you attend lectures, since we will be covering quite a lot of material that does not appear in the textbook. On Fridays, you will attend a 50-minute section with your teaching assistant. I also encourage you to attend office hours (both mine and those held by the TAs).

**SECTION REGISTRATION, E-MAIL, AND COURSE WEBSITE**

We will make extensive use of our class web site throughout the quarter. As soon as possible, and certainly by close of business Monday, September 28th, please indicate your preference for a TA section on the Econ 102A course website at <http://coursework.stanford.edu>. Also remember to add Econ 102A to your study list in Axxess; if you do so immediately, it will simplify your coursework registration. All homework assignments, answer keys, handouts, and supplementary readings will be available on coursework. Our coursework website will also provide information about office hour times and locations; the TAs and I will use coursework to make course-related e-mail announcements. Make sure that you check coursework frequently!

**TEACHING ASSISTANTS AND SECTION MEETINGS**

You will be assigned a teaching assistant and a specific TA section meeting time by Thursday, October 1st. Sections will meet for the first time on Friday, October 2nd. In section meetings, TAs will collect and return homework, review each week's material, and present examples not covered in lectures. You will be responsible for all material covered in sections.

**HOMEWORK**

Homework will be assigned approximately every week, and will be due during your TA section meetings unless otherwise announced. If you are unable to hand in an assignment during section, due to travel plans or other conflicts, you can submit a hard copy or fax your homework early. Make sure, though, that you make these arrangements with me or with your TA *beforehand*. No late homework will be accepted. I will drop your lowest homework score in calculating your final grade, so you will not be penalized if illness, travel, emergency, stress, or laziness should cause you to skip one assignment.

**MIDTERM AND FINAL EXAM**

There will be one midterm exam in class on Wednesday, October 28, 2009. The final exam will be on Monday, December 7, 2009 from 12:15-3:15 pm. There will be no make-up exams and no early sittings for exams. If you cannot make these exam times, you should plan to take the course in another quarter. Varsity athletes or others traveling on official university business may be able to take exams by fax: please contact me well in advance in order to make arrangements. If

a documented emergency renders you unable to take the final exam at the appointed time, but you have completed all other requirements for the course, I can give you a grade of “Incomplete” to be resolved by taking the Econ 102A final exam at the end of a future quarter.

### **GRADING**

Your final numerical average will be calculated based on your performance on homework (30%), midterm (30%), and final exam (40%). Numerical scores will not be converted to letter grades until the very end of the quarter. Specific letter grades will never be assigned to individual homework assignments or exams. If, due to a serious illness or family death, you are unable to take the midterm exam, your final grade will be based solely on your homework, class participation, and final exam. You must contact me immediately with appropriate documentation, though, in order to receive this accommodation.

### **STUDENTS WITH DOCUMENTED DISABILITIES**

Students who have a physical or mental impairment that may necessitate an academic accommodation or the use of auxiliary aids and services in a class must provide a verification letter dated in the current academic term from the Student Disability Resource Center (DRC). Please contact the DRC as soon as possible and provide me with your letter by the end of the second week of class, October 2nd, in order to ensure that we can accommodate your needs. The DRC is located at 563 Salvatierra Walk (phone 723-1066 Voice; 725-1067 TTY; <http://www.stanford.edu/group/DRC/>).

### **REQUIRED TEXT**

Moore, McCabe, Duckworth, and Sclove, *The Practice of Business Statistics*, Freeman, 2<sup>nd</sup> Edition, 2009.

### **LECTURE NOTES AND CLASS ATTENDANCE**

The notes you take during class lectures will serve as your single best resource in preparing for homework assignments and exams and in identifying which topics are most important. The material covered in lectures will roughly follow the topics presented in the Moore, McCabe, Duckworth, and Sclove (MMDS) text. I will assign some problems directly from the textbook in our weekly homework assignments; I strongly encourage you work through many additional

problems (particularly those for which answers appear in the back of the book!) as part of your own study. We will often explore topics in greater mathematical detail than MMDS. Accordingly, I will provide you with some additional resources and handouts based on other texts during the quarter.

#### **ECONOMICS DEPARTMENT COMMON COURSE POLICIES**

*All courses taught in the Stanford Department of Economics are governed by a common set of course management rules.* A document explaining these rules may be found on the Economics Department website at <http://economics.stanford.edu/undergraduate/economics-common-syllabus>. Please be sure to read this document in its entirety, and let me know if you have any questions. This document defines in specific terms situations like “illness” and “death on family”.

**COURSE LECTURE & READINGS SCHEDULE (SUBJECT TO REVISION)**

<b>Date</b>	<b>Subject</b>	<b>Textbook Readings</b>
Mon, 9/21	Course overview; introduction to single-variable descriptive statistics; graphs and histograms; measures of central tendency and variability	Chapter 1
Wed, 9/23	Single-variable distribution functions; introduction to the normal distribution	Chapter 1
<b>Mon, 9/28</b>	<b>NO CLASS</b>	
Wed, 9/30	Two-variable statistics; scatterplots; correlation and covariance; introduction to least-squares regression	Chapter 2
Mon, 10/5	Regression and correlation; joint, marginal, and conditional distribution functions	Chapter 2
Wed, 10/7	Sampling; experimental design	Chapter 3
Mon, 10/12	Probability; random variables; sampling distributions	Chapter 4
Wed, 10/14	Probability; random variables; sampling distributions	Chapter 4
Mon, 10/19	Probability theory; independence	Chapter 5
Wed, 10/21	Probability theory, continued; Conditional probability; Bayes's rule	Chapter 5
Mon, 10/26	Some important distributions	Chapter 5
<b>Wed, 10/28</b>	<b>MIDTERM EXAM (in class)</b>	
Mon, 11/2	Confidence intervals	Chapter 6
Wed, 11/4	Significance tests	Chapter 6
Mon, 11/9	Inference on means; comparing means	Chapter 7
Wed, 11/11	Inference on variance; comparing variances	Chapter 7
Mon, 11/16	Inference on proportions; comparing proportions	Chapter 8
Wed, 11/18	Inference on two-way tables	Chapter 9
<b>Mon, 11/23</b>	<b>THANKSGIVING RECESS</b>	
<b>Wed, 11/25</b>	<b>THANKSGIVING RECESS</b>	
Mon, 11/30	Regression Inference	Chapter 10
Wed, 12/2	Multiple Regression, summary and review	Chapter 11
<b>Mon, 12/7</b>	<b>FINAL EXAM 12:15-3:15 pm</b>	