ECONOMICS 83A
STATISTICS AND ECONOMIC ANALYSIS

OVERVIEW

This course provides an introduction to the statistical techniques that are used in analyzing quantitative problems in economics. Topics covered include mean, variance, probability, sampling, estimation, hypothesis testing, and regression analysis. We will also learn how to use STATA. Recitation for this class meets on Wednesdays from 6:30pm – 8:20pm in XXX.

PRE-REQUISITES

Econ 2a or Econ 10a. Calculus requirement: You must have either completed Math 10A with a grade of C- or higher, obtained a 4 or higher on the AP Math AB test, obtained a 3 or higher on the AP Math BC test, or passed the calculus placement exam given by the Economics department.

REQUIREMENTS

Course requirements include timely completion of assigned readings, mandatory attendance at lectures, problem sets, in-class quizzes, two midterms, and a final exam. The midterms and final exam (cumulative) are closed-book closed-notes exams. Six problem sets will be assigned. You may discuss your problem sets with other students but answers must be written individually. Since you have a week for each problem set, these are due first thing in class, and no late problem sets will be accepted whatever the reason. There will be three quizzes which are open-book/notes.

No makeup exams or quizzes will be offered during the semester. Absence from an exam or quiz is excused only if the student has a serious illness or family emergency that has been previously documented. There are no exceptions to this rule. A student who is unable to take the final exam for a legitimate reason must obtain advance authorization from the Office of Undergraduate Academic Affairs.

The weighting scheme for course requirements is as shown below:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Weighting</th>
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<tbody>
<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td>Midterm Exam I</td>
<td>20%</td>
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<tr>
<td>Midterm Exam II</td>
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<tr>
<td>Three In-class quizzes</td>
<td>15%</td>
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<tr>
<td>Six Problem Sets</td>
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IMPORTANT DATES

Exams:  Midterm Exam I – Friday, October 2, in class
        Midterm Exam II – Friday, November 6, in class
        Final Exam – TBD
Quizzes:
- Open book quiz I – Tuesday, September 22, in class
- Open book quiz II – Friday, October 30, in class
- Open book quiz III – Tuesday, December 1, in class

Problem Sets:
- Problem Set 1 – Assigned on September 1, due on September 8
- Problem Set 2 – Assigned on September 11, due on September 22
- Problem Set 3 – Assigned on October 6, due on October 13
- Problem Set 4 – Assigned on October 13, due on October 20
- Problem Set 5 – Assigned on October 27, due on November 3
- Problem Set 6 – Assigned on November 13, due on November 20

TEXTBOOK
The text is Wonnacott and Wonnacott, *Introductory Statistics* (5th edition). Weekly assigned readings from the text are as highlighted below.

SPECIAL ACCOMMODATION
If you are a student with a documented disability on record at Brandeis University and wish to have a reasonable accommodation made for you in this class, please see me immediately. Please keep in mind that reasonable accommodations are not provided retroactively.

ACADEMIC HONESTY
You are expected to be familiar with and to follow the University’s policies on academic integrity (see http://www.brandeis.edu/studentlife/sdje/ai/). Instances of alleged dishonesty will be forwarded to the Office of Campus Life for possible referral to the Student Judicial System. Potential sanctions include failure in the course and suspension from the University. If you have any questions about my expectations, please ask.

*Academic dishonesty will not be tolerated and will be vigorously prosecuted.*

OUTLINE OF LECTURES AND RECOMMENDED READINGS

**Week 1 (August 28):**

*The Nature of Statistic* - W&W, Chapter 1 - Random sampling and randomized experiments.

**Week 2 (September 1, 4):**

*Descriptive Statistics* - W&W, Chapter 2 - Mean, variance, frequency tables and graphs.

*Probability* - W&W, Chapter 3 - Probability models, conditional probability, independence, and Bayes theorem.
Week 3 (September 8):

*Problem Set 1 Due:* Tuesday, September 8, in class

*Probability Distributions* - W&W, Chapter 4 - Discrete random variables, the Binomial distribution, the Normal distribution.

Week 3 & 4 (September 11, 18):

*Two Random Variables* - W&W, Chapter 5 - Functions of two random variables, covariance, linear combination of two random variables.

Week 5 (September 22, 25):

*Problem Set 2 Due:* Tuesday, September 22, in class

*Quiz 1:* Tuesday, September 22, in class

*Sampling* - W&W, Chapter 6 - Random sampling, shape of the sampling distribution.

Week 6 & 7 (October 2, 6):

*Pre-exam Review Session:* Wednesday, September 30, Recitation

*Midterm Exam 1:* Friday, October 2, in class

*Point Estimation* - W&W, Chapter 7 – Populations and samples, efficiency of unbiased estimators, consistent estimators.

Week 7 (October 9):

*Confidence Intervals* - W&W, Chapter 8 – A single mean, small sample t, difference in two means.

Week 8 (October 13, 16):

*Problem Set 3 Due:* Tuesday, October 13, in class

*Confidence Intervals* - W&W, Chapter 8 – A single mean, small sample t, difference in two means.

*Hypothesis Testing* - W&W, Chapter 9 – Hypothesis testing using confidence intervals, p-values.

Week 9 (October 20, 23):

*Problem Set 4 Due:* Tuesday, October 20, in class

*Fitting a Line* - W&W, Chapter 11 – Ordinary Least Squares.
Week 10 (October 27, October 30):

**Quiz 2:** Friday, October 30, in class

*Simple Regression* - W&W, Chapter 12 – The regression model, confidence intervals, prediction.

*Multiple Regression* - W&W, Chapter 13 – The regression model and its OLS fit, confidence intervals and statistical tests.

Week 11 (November 3, 6):

*Pre-exam Review Session:* Wednesday, November 4, Recitation  
*Problem Set 5 Due:* Tuesday, November 3, in class  
*Midterm Exam 2:* Friday, November 6, in class

*Multiple Regression* - W&W, Chapter 13 – The regression model and its OLS fit, confidence intervals and statistical tests.

Week 12 (November 10, 13):


Week 13 (November 17):


Week 13 & 14 (November 20, November 24):

*Problem Set 6 Due:* Friday, November 20, in class

*STATA Sessions*

Week 15 & 16 (December 1, 4, 8):

**Quiz 3:** Tuesday, December 1, in class  
*Analysis of Variance* - W&W, Chapter 10 – One way ANOVA.

Review

**Final Exam:** TBD

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