ECONOMICS 83A
STATISTICS AND ECONOMIC ANALYSIS

OVERVIEW & LEARNING GOALS

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 basic regression analysis. We will also learn how to use STATA. Recitation for this class meets on Tuesdays from 6:30pm – 8:20pm in Pollack 001.

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

Success in this four-credit course is based on the expectation that students will spend a minimum of 9 hours of study time per week in preparation for class (readings, papers, discussion sections, preparation for exams, research, etc.). Instruction begins on the first day of class; students are responsible for learning material and completing assignments from the beginning of the course. Course requirements include timely completion of assigned readings, mandatory attendance at lectures, completion of problem sets, STATA exercises, quizzes, midterm exams, 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. No late problem sets will be accepted whatever the reason. There will be three quizzes and two STATA exercises that 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>Weightage</th>
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<tbody>
<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>Midterm Exam I</td>
<td>20%</td>
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<tr>
<td>Midterm Exam II</td>
<td>20%</td>
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<tr>
<td>Three In-class quizzes</td>
<td>15%</td>
</tr>
<tr>
<td>STATA exercises</td>
<td>5%</td>
</tr>
<tr>
<td>Six Problem Sets</td>
<td>15%</td>
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</tbody>
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IMPORTANT DATES

Exams:  
Midterm Exam I – Thursday, October 3 (Brandeis Monday)  
Midterm Exam II – Monday, November 11  
Final Exam – TBD
**Quizzes:**
- In-class open book quiz I – Wednesday, September 25
- In-class open book quiz II – Monday, November 4
- In-class open book quiz III – Wednesday, December 4

**Stata Ex:**
- Monday November 25, Monday December 2

**Problem Sets:**
- Problem Set 1 – Assigned on September 4, due on September 11
- Problem Set 2 – Assigned on September 16, due on September 23
- Problem Set 3 – Assigned on October 3, due on October 15
- Problem Set 4 – Assigned on October 16, due on October 23
- Problem Set 5 – Assigned on October 30, due on November 6
- 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.

**LAPTOP, TABLET AND CELL PHONE POLICY**

**The use of cell phones, tablets, and laptops in class is prohibited.** If you must take a call, please leave the classroom. Please speak to me if you are unable to take notes without the use of a laptop. Recording of lectures is prohibited without prior arrangement with me.

**COMMUNICATION**

There is a LATTE page for this course. Problem sets, information and announcements will be posted there.

**SPECIAL ACCOMMODATION**

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please talk to me and present your letter of accommodation *as soon as you can*. I want to support you.

In order to provide test accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu.

**ACADEMIC HONESTY**

You are expected to be honest in all of your academic work. Please consult Brandeis University *Rights and Responsibilities* for all policies and procedures related to academic integrity. Students may be required to submit work to TurnItIn.com software to verify originality. Allegations of alleged academic dishonesty will be forwarded to the Director of Academic Integrity. Sanctions for academic dishonesty can include failing grades and/or suspension from the university. Citation and research assistance can be found at *LTS - Library guides*. 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.

Weeks 2 & 3 (September 4, 9):

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 11):

Problem Set 1 Due: Wednesday, September 11, in class

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

Week 4 (September 16, 18):

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

Week 5 (September 23, 25):

Problem Set 2 Due: Monday, September 23, in class
Pre-exam Review Session: Tuesday, September 24, Recitation
Quiz 1: Wednesday, September 25

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

Week 6 (October 2, 3):

Midterm Exam 1: Thursday, October 3 (Brandeis Monday)

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

Week 7 (October 7):

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

Week 8 (October 15, 16):

Problem Set 3 Due: Tuesday, October 15 (Brandeis Monday), 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.
Weeks 9 & 10 (October 23, 28):

Problem Set 4 Due: Wednesday, October 23, in class

Fitting a Line - W&W, Chapter 11 – Ordinary Least Squares.

Weeks 10 & 11 (October 30, November 4):

Quiz 2: Monday, November 4

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.

Weeks 11 & 12 (November 6, 11):

Pre-exam Review Session: Tuesday, November 5, Recitation
Problem Set 5 Due: Wednesday, November 6, in class
Midterm Exam 2: Monday, November 11

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

Weeks 12 & 13 (November 13, 18):

Regression Extensions, Correlation - W&W, Chapters 14 & 15 – Dummy variables, correlation and regression.

Weeks 13 & 14 (November 20, 25):

Problem Set 6 Due: Wednesday, November 20, in class

STATA Session on November 25

Week 15 (December 2, 4):

Quiz 3: Wednesday, December 4

STATA Session on December 2

Week 16 (December 9):

Analysis of Variance - W&W, Chapter 10 – One way ANOVA.

Review

Final Exam: TBD

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