83A – Statistics and Economic Analysis
Fall 2018

Course Overview: This course is designed to provide a working knowledge of the analytical tools of probability and statistics used in economic analysis. Some of the topics that we will cover include descriptive statistics, probability theory, the Central Limit Theorem, confidence intervals and hypothesis testing. The course will conclude with an introduction to regression analysis using the bivariate model involving a derivation of the ordinary least squares estimators, inference, and goodness of fit.

Course Goals: By the end of this class you should be able to both calculate and interpret basic descriptive statistics; perform hypothesis testing; and understand the underlying concepts of bivariate regression analysis.

Course Meeting Times: T/F 8:00 a.m. - 9:20 a.m.
Recitation: TBA
Office Hours: T/F 11:00 a.m. - noon or by appointment


Course Requirements: Mandatory attendance at lectures and recitation (attendance will be taken and recorded), the completion of course assignments, two midterms, a data project, and a final exam. Grading in the course will be as follows:

1. Assignments (10% of grade) – I will assign 8 assignments over the course of the semester. You are required to turn in all of these exercises. You must do these exercises on your own. Assignments will be due in class (due dates are given in the syllabus). NO late assignments will be accepted.

2. Midterm exams (50%) - There will be 2 midterm exams given during the semester, each worth 25%.

3. Final exam (40%) to be held during the final exam period.

Please note that there will be NO make-up exams given. Absence from an exam will be excused only for a serious illness or bereavement (which must be documented). 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. There are NO EXCEPTIONS to these rules.

Special Accommodations: 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 honest in all of your academic work. Please consult Brandeis University Rights and Responsibilities for all polices 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.
DATES TO REMEMBER

Sept 25: Brandeis Monday. No class.
Oct 12: Midterm 1, in class.
Nov 13: Midterm 2, in class.
Nov 21 - 23: Thanksgiving Break. No scheduled classes.
Dec 7: Last day of classes.

ASSIGNMENT DUE DATES

Sept 14: Assignment #1
Sept 21: Assignment #2
Oct 2: Assignment #3
Oct 19: Assignment #4
Oct 30: Assignment #5
Nov 6: Assignment #6
Nov 16: Assignment #7
Dec 4: Assignment #8

Note: All assignments will be posted on Latte.

ADDITIONAL REQUIREMENTS

You will be required to purchase a NON-PROGRAMMABLE calculator for this class. This will be the ONLY calculator that will be allowed for use in the exams. There will be no exceptions to this rule. This means that you may NOT bring in a programmable graphing calculator (whether or not you can show that there are no stored programs). Your calculator should be able to perform square roots, but nothing more complicated will be necessary. If your calculator does not meet these specifications, you will have to do without a calculator for the exam. You may not use your cell-phone or any other device as a calculator.
Please note: I highly recommend that you do the readings BEFORE lecture. Course assignments and additional handouts will be available on Latte. Be sure to check Latte REGULARLY for course information and updates. 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.

1. **Aug 31**  
**Fri**  
Introduction: The role of probability and statistics in economic analysis, descriptive statistics. Overview of the course. Introduction to the notion of “population” versus “sample.” Discussion on types of data: nominal, ordinal, interval, ratio. Describing data in a meaningful way through descriptive statistics: frequencies, relative frequencies, percentiles, measures of central tendencies. Introduction to descriptive statistics.

Read: W&W 1.1 - 1.3, 2.1, 2.3, 2.5-2.7

2. **Sept 4**  
**Tues**  
More on descriptive statistics and an introduction to probability theory. Different measures of “central” tendencies (means, modes, medians). Various measures of dispersion. The effect of scale on measures of the mean and the variance. What is a “sample space?” What is an “event?” Manipulating the event space: intersections and unions of events. Compliments and mutually exclusive sets. Relationship between relative frequencies and probabilities.

Read: W&W 3.1 - 3.3

3. **Sept 7**  
**Fri**  

Read: W&W 3.4-3.7

4. **Sept 14**  
**Fri**  

Read: W&W 4.1-4.3

Assignment #1 due in class.

5. **Sept 18**  
**Tues**  

Read: W&W 4.4-4.5
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<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
<th>Notes</th>
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<tr>
<td>7. Sept 28</td>
<td>Fri</td>
<td>Functions of Several Random Variables. Creating new random variables that are functions of several random variables. Constructing the probability distribution function for the new variable.</td>
<td>Read: W&amp;W 5.1-5.2</td>
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<td>8. Oct 2</td>
<td>Tues</td>
<td>Covariance and Correlation. Variance measures for functions of random variables. Measures of covariance and correlation between random variables. Interpretation of these measures.</td>
<td>Read: W&amp;W 5.3-5.4 Assignment #3 due in class.</td>
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<td>10. Oct 9</td>
<td>Tues</td>
<td>Review</td>
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<td>11. Oct 12</td>
<td>Fri</td>
<td>Midterm #1, in class</td>
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<td>12. Oct 16</td>
<td>Tues</td>
<td>(Return exams, and go over in class.)</td>
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Read: W&W 8.3 - 8.4.

Read: W&W 9.1 - 9.3, 9.6  
Assignment #5 due in class.


18. Nov 6  Tues  Type I and Type II Errors. What is the significance of Type I and II errors? Determining which one you might be committing. Calculating Type I and Type II errors.  
Read: W&W 9.3 - 9.5  
Assignment #6 due in class.


20. Nov 13  Tues  Midterm #2, in class

Read: Handout on Regression Analysis (Based on Wooldridge, Introductory Econometrics: A Modern Approach 2E)  
Assignment #7 due in class.


Nov 21 - 23  Thanksgiving Break. No classes


25. Dec 4  Tues  Inference. How to conduct t-tests.

Assignment #8 due in class.
26. DEC 7  FRI  Review for final exam.

27. DEC 11  TUES  Class cancelled.