

Applied Econometrics 1: Theory and Applications

Instructor:	Romi Kher, Ph.D. Lawrence N. Field Department of Entrepreneurship and Innovation
Class Times:	Tuesdays 2:00pm - 5:00pm
Classroom:	In person, VC 9-240
Office:	VC 9-250
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Office Hours:	In-person or Zoom, by appointment

About The Course

Econometrics is an integration of economics, mathematical modeling, and statistics with an objective to test theory from observable data and provide numerical values to the parameters of interest. While statistical association is always possible, the course will focus on introductory quantitative methods to help us understand, predict, and analyze observed phenomena. We will approach these methods from the perspective of a business researcher and (a) understand the math underlying these methods, (b) delve into the intuition behind these methods and, (c) learn how to apply these methods to initiate empirical research. The course will balance technical proficiency (learning the tools) with empirical relevance (applying the tools) to focus on the proper interpretation of the results. This course is for doctoral students with limited prior experience with econometrics and is designed to provide them with analytical tools as part of their research careers.

Course and Learning Objectives

By the end of the course, you should be able to:

1. Understand what Ordinary Least Squares (OLS) and Logistic regression models are, what they estimate, and why they are useful.
2. Interpret regression results as they are typically represented in statistical software packages and academic articles.
3. Use Stata to run your own regressions and answer interesting questions related to observed phenomena.
4. Think critically about the assumptions underlying your (or another researcher's) interpretation of regression output and test whether these assumptions are likely to hold.
5. Have a better understanding of the statistical models that underlie research in your field of interest.

Course Philosophy & Structure

This course is for students interested in an active, hands-on approach to learning. Sharing your experiences and your struggles (as they apply to the class topics) will facilitate learning and maximize class benefits.

Each week, our class will be structured in approximately the same way:

- Part 1: Discuss the assignment from last time.
- Part 2: Learn a new topic/method.
- Part 3: Undertake applied exercises on the new topic.

Prior to the next class, students will complete the assigned readings (textbook chapter and/or exemplar paper) on the underlying theory for the next method/topic and attempt the assignment.

Required Materials

1. Introductory Econometrics: A Modern Approach, by Jeffrey M. Wooldridge. 8th Edition.
2. Stata, statistical software. This is available for free to CUNY students. Check with your doctoral program coordinator for access.
3. A computer. We will be working through assignments in class so please bring a computer to class with Stata installed.

Additional Resources

(and yes, these links are actually helpful and not listed simply to fill space)

1. [YouTube videos](#) that compliment our textbook. These are great for visual learners!
2. [Basic Econometrics](#) by D.N. Gujarati and D. Porter. An excellent introductory book.

Throughout the term, relevant readings and articles will be posted. Please check the course site regularly to keep up with the latest developments.

Grading

1. Two (2) exams	40%
2. Homework + Peer teaching + Pop quizzes + Data analysis + Presentation	60%

Course Outline

This is a suggested outline and can change based on how our class is progressing and/or student interest in certain topics. For your reference, the Academic Calendar can be found [here](#).

Date	Topic
Aug 26	Course introduction Introduction to set theory, Central Limit Theorem
Sep 2	Introduction to statistics Research study designs
Sep 9	Probability theory Correlation, ANOVA, MANOVA, and ANCOVA
Sep 16	Exam 1 Introduction to Stata
<i>Sep 23</i>	<i>No class per Baruch calendar</i>
Sep 30	Simple regression analysis Derivations, properties and functional forms of OLS
Oct 7	Hands-on with OLS in Stata
<i>Oct 14</i>	<i>No class, Baruch follows a Monday schedule</i>
Oct 21	Multiple regression analysis Expected value, variance and efficiency of estimators (G-M theorem)
Oct 28	Multiple regression analysis Inference, confidence intervals, sampling distributions
Nov 4	Multiple regression analysis Asymptotics, goodness of fit, residual analysis
Nov 11	Multiple regression analysis Heteroskedasticity, dummy variables, interactions, nested models
Nov 18	Logistic regression
Nov 25	Peer teaching – advanced forms of logits/probits, fixed versus random effects, multicollinearity, endogeneity.
Dec 2	Hands-on with real data – student driven analysis
Dec 9	Exam 2 Presentations – present and discuss findings of original data analysis