

## Econ 184b

### Econometrics (Spring 2014)

Instructor:	Professor Davide Pettenuzzo ( <a href="mailto:dpettenu@brandeis.edu">dpettenu@brandeis.edu</a> )
Office and tel.:	Sachar 216, x62834
Office hours:	Wed 10:00 AM - 11:00 AM or by appointment
Teaching fellows:	Rosby Kome-Mensah <a href="mailto:rosby@brandeis.edu">rosby@brandeis.edu</a> Becky Zhang <a href="mailto:zbecky@brandeis.edu">zbecky@brandeis.edu</a>
Lecture room and times:	Pollack Fine Arts, 001 Tue & Thu, 3:30 – 4:50 PM
Recitation room and time:	Pollack Fine Arts, 001 Wed, 6:30 – 7:20 PM

### **Course description**

This course provides an introduction to multiple regression methods for analyzing data in economics and related disciplines. Starting from the linear regression method, the course will extend to regression with discrete random variables, instrumental variables regression, analysis of random experiments and quasi-experiments, and regression with time series data. The objective of the course is twofold: (i) understand the logic and the key intuitions behind the various econometric procedures, and (ii) learn how to conduct – and how to critique – empirical studies in economics and related fields. Accordingly, the course will devote significant space to empirical applications. Through the use of econometric software and a variety of empirical data sets, you will have the opportunity to gain hands-on experience on how to conduct empirical work in econometrics.

Upon successful completion of the course you will:

- Understand the basic statistical assumptions underlying regression analysis and the situations in which these assumptions are appropriate;
- Be able to identify when the basic regression assumptions may be violated and to correct for these violations using appropriate techniques;
- Be able to critically assess empirical studies in economics and other professional journals;
- Have proficiency using STATA (a widely-used statistical software package);
- Be able to implement original research using the empirical techniques you have learned.

Prerequisites: Econ 80a and Econ 83a; Econ 80a may be taken concurrently.

### **Textbooks and reading material**

The required textbook for the course is James H. Stock and Mark W. Watson, Introduction to Econometrics (3<sup>rd</sup> edition), Pearson/Addison Wesley, 2011. Additional readings will be posted on LATTE as the course progresses.

## Attendance

Learning in econometrics is cumulative; that is, each topic builds on the previous one. As a result, attendance is extremely important and will be required at all class meetings. I will be collecting attendance sheets at the end of every class, and your participation during classes will count toward the final grade.

## Evaluation

You will be evaluated on the following:

- Problem sets                    20%
- Midterm 1                        20%
- Midterm 2                        20%
- Final exam                        40%

As for the first item above, various problem sets will be distributed during the semester (approximately, one every two weeks). Complete problem sets must be turned in at the beginning of the class on the due date. Late problem sets will **not** be accepted under any circumstances. To accommodate special circumstances (e.g. illnesses, unforeseen conflicts), I will drop the lowest score among your problem sets from the final grade calculation. ). If you would like, you may work in small groups of 2-3 people to discuss the problem sets. However, you *must* write up answers individually. When you hand in your PS, make sure to list the members of your group. Note that if you simply copy your answers from one of your classmates in addition to receiving a zero on the problem set you will be in violation of Brandeis rules on academic honesty and may not receive credit for the course. Solutions will be posted on LATTE after you have handed in the problem set.

There will be no make-up midterms. If you think you may have to miss one of the midterms, you need to contact me *before* the exam and have a *very* good reason. If you miss one of them, and you have a very good reason for missing it, then more weight will be put on the other components of your grade. Note that in the absence of a valid reason, your grade on that midterm will be zero, and furthermore will count towards your final grade. All exams will be based on material covered up to the point at which the exam is held. Please note that absence from final exam will be excused only for a serious illness or family emergency which will need to be appropriately documented.

## Course outline

- Week 1
  - Tue Jan 14: Introduction to the course
  - Thu Jan 16: Review of probability
- Week 2
  - Tue Jan 21: Review of probability (continued)
  - Thu Jan 23: Review of statistics – PS # 1
- Week 3
  - Tue Jan 28: Review of statistics (continued)
  - Thu Jan 30: Linear regression model with one regressor – PS #1 due
- Week 4
  - Tue Feb 4 Inference in linear regression with one regressor – PS # 2
  - Thu Feb 6: Linear regression model with multiple regressors
- Week 5
  - Tue Feb 11: Review session – PS # 2 due
  - Thu Feb 13: **Midterm 1**
- Week 6
  - Tue Feb 25: Inference in linear regression with multiple regressors – PS # 3
  - Thu Feb 27: Inference in linear regression with multiple regressors

- Week 7
  - Tue Mar 4: Nonlinear regression functions – PS # 3 due
  - Thu Mar 6: Nonlinear regression functions
- Week 8
  - Tue Mar 11: Assessing studies based on multiple regression – PS # 4
  - Thu Mar 13: Regression with panel data variables
- Week 9
  - Tue Mar 18: Regression with panel data variables – PS # 4 due
  - Thu Mar 20: Instrumental variables regression – PS # 5
- Week 10
  - Tue Mar 25: Review session
  - Thu Mar 27: **Midterm 2**
- Week 11
  - Tue Apr 1: Instrumental variables regression
  - Thu Apr 3: Regression with binary dependent variables - PS # 5 due
- Week 12
  - Tue Apr 8: Regression with binary dependent variables – PS #6
  - Thu Apr 10: Introduction to time series
- Week 13
  - Tue Apr 22: Introduction to time series – PS # 6 due
  - Thu Apr 24: Nonstationarities in time series
- Week 14:
  - Tue Apr 29: Review session

## Disabilities

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.

## Academic Integrity

You are expected to be familiar with and to follow the University's policies on academic integrity (see <http://www.brandeis.edu/studentlife/sdc/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.