Econ 213a – Applied Econometrics with R

Fall 2018

Instructor:	Professor Davide Pettenuzzo (dpettenu@brandeis.edu)
Office and tel.:	Sachar 122, x62834
Office hours:	Wed 10:00 AM - 11:00 AM or by appointment
Teaching Assistants:	1. TBD
Lecture room and times:	Pollack Auditorium Tue & Thu, 3:30 PM – 4:50 PM
Recitation room and time:	TBD (Once a week)

Course description

This course aims at introducing econometric models and empirical techniques that are useful to conduct economic research with data. The course covers linear regression models, discrete choice models, time series models, and panel data models. We will devote significant space to empirical applications, and give the students the opportunity to gain hands-on experience on how to conduct empirical work in econometrics using the R programming language.

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 the R programming language in Econometrics;

Prerequisites: ECON 210f or a statistics course.

Success in this 4 credit hour 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, etc.).

Textbooks and reading material

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

Evaluation

You will be evaluated on the following:

- Attendance and participation 10%
- Problem sets 20%
- Midterm 30%
- Final exam 40%

Attendance and class participation: 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, including recitations. **I will be collecting attendance sheets at the end of every class and recitation**, and your participation during classes will count toward the final grade. Students are also expected to read the assigned materials and participate in class discussions on a regular basis.

Problem sets: Various problem sets will be distributed during the semester (approximately, one every two weeks, check the last part of this syllabus for the exact dates). Complete problem sets must be turned in at the beginning of the class on the due date. **Your problem sets must be legible, stapled, and must show all of your work including R output.** Teaching assistants are permitted to give partial or zero credit otherwise, including taking off points for an unstapled problem set. **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).

I expect the homework assignments to be done individually. However, I encourage you to consult with each other in working the homework assignments, although copying someone else's work is not permitted. 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. The homework assignments will include problems as well as empirical exercises, and will serve to reinforce material discussed in class. Solutions will be posted on LATTE after you have handed in the problem set.

Midterm: The Midterm date is posted below in the course outline. Note that there will be no make-up midterm. 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 the midterm will be zero, and furthermore will count towards your final grade. **The midterm will be based on material covered up to the point at which the exam is held.**

Final exam: The final exam will be cumulative, but with a stronger emphasis on the material covered after the second midterm. Please note that absence from final exam will excused only for a serious illness or family emergency which will need to be appropriately documented.

Course outline

- Week 1
  - Thu Aug 30: Introduction to the course
  - Tue Sep 4: Review of statistics and probability
  - Wed Sep 5: Recitation # 1 (Introduction to R in Applied Econometrics, part 1 - Computer classroom TBD)
- Week 2
  - Wed Sep 12: Recitation # 2 (Introduction to R in Applied Econometrics, part 2 - Computer classroom TBD)
  - Thu Sep 13: Review of statistics and probability (continued)
  - Tue Sep 18: Linear regression model with one regressor – PS # 1
- Week 3
  - Thu Sep 20: Inference in linear regression with one regressor
  - Wed Sep 26: Recitation # 3
  - Thu Sep 27: Linear regression model with multiple regressors – PS #1 due
- Week 4
  - Tue Oct 2: Inference in linear regression with multiple regressors – PS # 2
  - Wed Oct 3: Recitation # 4
  - Thu Oct 4: Inference in linear regression with multiple regressors
- Week 5
  - Tue Oct 9: Nonlinear regression functions – PS # 2 due
  - Wed Oct 10: Recitation # 5
  - Thu Oct 11: Nonlinear regression functions – PS # 3
- Week 6
  - Tue Oct 16: Assessing studies based on multiple regression
  - Wed Oct 17: Recitation # 6
  - Thu Oct 18: Review session – PS # 3 due
- Week 7
  - Tue Oct 23: **Midterm**
  - Thu Oct 25: Regression with panel data variables
- Week 8
  - Tue Oct 30: Regression with panel data variables – PS # 4
  - Wed Oct 31: Recitation # 7
  - Thu Nov 1: Instrumental variables regression
- Week 9
  - Tue Nov 6: Instrumental variables regression – PS # 4 due
  - Wed Nov 7: Recitation # 8
  - Thu Nov 8: Regression with binary dependent variables
- Week 10
  - Tue Nov 13: Regression with binary dependent variables – PS # 5
  - Wed Nov 14: Recitation # 10
  - Thu Nov 15: Regression with binary dependent variables
- Week 11
  - Tue Nov 20: Introduction to time series - PS # 5 due
- Week 12
  - Tue Nov 27: Introduction to time series
  - Wed Nov 28: Recitation # 11

    - Thu Nov 29: Estimation of Dynamic Causal Effects
- Week 13
    - Tue Dec 4: Estimation of Dynamic Causal Effects – PS #6
    - Wed Dec 5: Recitation # 12
    - Thu Dec 6: Additional topics in time series regression – PS # 6 due
- Week 14
    - Tue Dec 11: 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.