

Syllabus: Introductory Econometrics

January 12, 2024

1 Course Overview

Welcome to our introductory course in econometrics. This course is meticulously designed to empower you with the essential skills in applying fundamental econometric tools. Our journey starts with an exploration of experimental designs and establishing benchmarks for causal models. This foundational knowledge sets the stage for delving into linear regression models, followed by a thorough study of Instrumental Variables (IV), Difference-in-Differences (DiD), and Regression Discontinuity Design (RDD) methods. These techniques are pivotal in the realm of econometrics.

Our teaching ethos is centered around practical application. We adopt a hands-on methodology, guiding you to discover and utilize pertinent resources effectively. Think of this course as a workshop, sculpting your proficiency in data analysis within the field of econometrics.

It's important to note that mastering these concepts demands considerable effort. As a guideline, anticipate dedicating approximately 3 hours of study per week for each credit hour. This course carries 4 credits, translating to an expected 12 hours of weekly engagement. This includes two hours of in-class interaction, leaving 10 hours for independent study and assignments.

Each week, you'll have access to 1 to 2 hours of pre-recorded lectures, complemented by 4 hours of practical exercises on DataCamp. In addition, expect to spend roughly another 4 hours on homework and supplementary reading.

While advanced theories and matrix algebra are crucial for more in-depth studies, they are reserved for subsequent courses. However, a solid foundation in Calculus and Statistics is vital to successfully navigate this course.

2 Format

- Tuesday 10:20 - 12:10
- Classroom: Social Science 403
- Credits: 4
- The teaching approach for this course will be a flipped classroom model. It is mandatory for you to watch pre-recorded videos in preparation for the class sessions. There will also be a large amount of weekly homework. The in-person class meetings will typically last less than 2 hours, from 10:20 - 12:10. During the class, active participation is encouraged, and we will engage in various activities such as discussing questions and coding exercises. We will hold office hours but no recitation will be given.

3 Programming Language

This course emphasizes the importance of programming skills in modern empirical economic research. The default programming language used in this course is R.

Programming is a key component of this course and students should be prepared to spend significant time cleaning data, coding models, and analyzing data. To assist in learning these skills, we utilize DataCamp, an online platform for learning programming. All students in this course will have free access to DataCamp. Many of the assignments will be in DataCamp.

We encourage students to employ all modern technologies that can assist in their research. This includes utilizing tools such as OpenAI to proofread homework.

4 Grading

Prerequisite Homework 10%, Homework 50%, Midterm Exam 20%, Final Exam 20%, Bonus 5%.

The Prerequisite Homework will be in the form of DataCamp exercise. You have to finish them by the end of the first week. There will be weekly homework that requires you to finish assigned DataCamp lessons. Additionally, we will also hand out other homework occasionally. Both Midterm and Final exams include a handwriting part and a programming part. Please prepare a laptop to attend the exams.

5 Textbook

There is no assigned textbook. However, we follow the structure of Angrist and Pischke (2009) and some content in Hansen (2022).

6 Weekly Schedule

Week 1: Experiments

Week 2: Experiments

Week 3: Regression

Week 4: Regression

Week 5: Regression

Week 6: Regression

Week 7: Midterm Exam

Week 8: IV

Week 9: IV

Week 10: IV

Week 11: IV

Week 12: DiD

Week 13: DiD

Week 14: RDD

Week 15: RDD

Week 15: Discrete Choice

References

ANGRIST, J. D. AND J.-S. PISCHKE (2009): *Mostly harmless econometrics: An empiricist's companion*, Princeton university press.

HANSEN, B. (2022): *Econometrics*, Princeton University Press.