Economics 120B - Econometrics Fall 2022

MWF 9:00 am - 9:50 am, Mosaic 0113

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Teaching Assistants Letian Yin lyin@ucsd.edu Office Hours: Tuesdays, 9:00 am - 10:30 am (Sequoyah Hall 233) Tieerd De Vries tidevrie@ucsd.edu Office Hours: Fridays, 10:30 am - 12:00 pm (https://ucsd.zoom.us/j/99383442941) Muhammad Karim mukarim@ucsd.edu Office Hours: Fridays, 3 – 4:30 pm (Sequoyah Hall 233) Weiyue (Larry) Li wel019@ucsd.edu Office Hours: Wednesdays, 5:00 pm - 6:30 pm (CSE Basement)

Discussion Sections

Mondays 4:00 – 4:50 pm, in PCYNH 121 Wednesdays 4:00 – 4:50 pm, in WLH 2205 Fridays 5:00 – 5:50 pm, in WLH 2111 (Stata Session) Fridays 6:00 – 6:50 pm, in WLH 2209

Course Description

The course aims to prepare students for practical empirical research in an academic or business setting. It introduces the three basic concepts in econometrics: quantifying uncertainty with confidence intervals; using regression to infer causal relationships; and using regression for prediction. It teaches competency in STATA. The course provides the standard tools necessary to perform and read empirical research.

Lectures and Discussion Sections

All lectures will be podcasted and screencasted and posted on our Canvas course, so you can be caught up with the material in the occasions you have to miss the class. I usually like to make the lectures quite interactive and call on students. I also will try to periodically pause the lectures to ask if there are any questions.

There are weekly discussion sections for this course, three are traditional discussion sessions, and one (Friday 5 pm) is a Stata tutorial session. You may attend any of the three regular discussion sessions, regardless of which session you are registered for. The three traditional discussion sessions aim to cover the same information, so you do not need to attend more than one. The discussion sessions will also be podcasted, screencasted and posted on Canvas course. The discussion sessions are not mandatory. However, you should attend them since the TAs will go over practice problems, the kind of problems you may encounter on exams. The first discussion section will take place Friday, September 30th.

Stata Tutorial Session

During this quarter, one of our discussion sessions (Fridays at 5pm) will be devoted to make students familiar with Stata. In those sessions, the TA will provide practical applications to facilitate the learning and use of STATA. The students will be able to follow and repeat the STATA commands using their own computers. The commands learned in these tutorials are mainly the ones you will need to know for the homework assignments.

Course Web Page

A course web page is available at https://canvas.ucsd.edu/

It will include information relevant to the course, such as recordings of lectures and discussion sessions, announcements, homework assignments, practice problem sets and tests, solutions, syllabus, schedule and more. You should check this page regularly.

Course Materials

<u>Required Textbook</u>: "Introduction to Econometrics" by James H. Stock and Mark W. Watson, 4th edition, Pearson/Addison-Wesley. Chapters to be covered: 1-8 (chapters 1-3 are review).

Red Shelf: Your digital course materials are provided by the UC San Diego Bookstore through Canvas and are free for the first two weeks of class. After two weeks, your student account will be charged a special reduced price unless you **opt out.** If you decide to opt out you must complete the process by **October 8th, 2022, 11:59PM PDT** and you will be responsible for sourcing the materials elsewhere.

If you have questions about Inclusive Access and how to access your course materials, visit <u>RedShelf Solve</u> For any questions about billing please contact <u>textbooks@ucsd.edu</u>.

To opt-out:

- Click the RedShelf link in Canvas

- Click View Course Materials

- Scroll down to the gray opt-out button and follow the prompts

You will have until **October 8th** to complete this process and you will be responsible for getting access to the materials elsewhere.

<u>Required Software</u>: The software for this course is STATA (<u>www.stata.com</u>). **Students are not required to buy the software** UCSD students will have access to Stata for free, to complete course work. You have the license information on a Module on Canvas.

Course Discussion Boards:

This quarter we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. I encourage you to post questions/answers on Piazza. You can access Piazza by clicking the tab on our Canvas course.

We also have a Discord server for this course: https://discord.gg/c5MHEkNC

Homework

There will be three homework assignments in this course. Homework assignments are STATA exercises and will serve as a way to learn and practice that software. Complete all your homework assignments on your own. Remember, homework is assigned to assist you in learning the software and at the same time it is a good check of your understanding of the econometrics concepts taught in class.

Grading

Item	Option 1	Option 2
Online Homework	10%	10%
Midterm 1: Wednesday, October 26 th , at lecture time	25%	Best
Midterm 2: Wednesday, November 16 th , at lecture time	25%	35%
Final: Wednesday, December 7 th , from 8 to 11 am	40%	55%

We will calculate for each student two point totals: 1) One that puts a weight 30% on first midterm exam, 30% on second midterm exam, and 40% on final. And 2) one that puts a weight of 30% on the best midterm score and a weight of 70% on the final score. Student's grade in this course will be based on the higher of the two point totals.

There are no make-up exams - a missed midterm exam automatically commits a student to the second grading option. You must take the final exam to receive a grade in this course.

Each test score is curved, and it is to the curved scores that we will apply the weights specified above. In general, the class average corresponds to the lowest B-.

Academic Integrity

- Students are expected to do their own work, as outlined in the UCSD policy on Academic Integrity. Cheating will not be tolerated, and any student who engages in suspicious conduct will be confronted and subjected to the disciplinary process. Students found guilty of academic dishonesty will earn a failing grade for the course. In addition, the Council of Deans of Student Affairs will impose a disciplinary penalty.
- The following are a few examples of academic dishonesty
 - 1. Having another student complete an assignment for you or give you answers to specific questions
 - 2. Using unauthorized materials in an exam
 - 3. Having someone else take your exam for you
 - 4. Lying about having taken an exam or completed an assignment

Outline of the Course

Part I: Introduction and Review (Chapters 1-3)

- Covariance and Correlation (Review)
- Correlation vs. causality; Policy analysis vs. prediction; Experimental vs. nonexperimental data
- Exact/finite sample distribution vs. large sample distribution
- Introduction to STATA (input data, create log and do files, run regressions, graph, etc.)

Part II. Linear Regression with One Regressor (Chapters 4 and 5)

- Least Square principle
- Sampling distribution of OLS estimator (data generating process)
- Confidence interval and hypothesis testing: small sample approach and large sample approach
- Revisit Econ 120A. Use regression with only intercept to infer about the mean
- Revisit Econ 120A. Use dummy variable regression to compare means from different subpopulations.

Part III. Linear Regression with Multiple Regressors (Chapters 6 and 7)

- Sampling distribution of the OLS estimator
- Confidence interval and hypothesis testing for a single coefficient
- Confidence set and joint hypothesis testing for more than one coefficient

Part IV. Topics in Multiple Regression (Chapters 8 and 9)

- Dummy variable regressions
- Modeling nonlinear functions
- Sources of OLS bias: measurement error, omitted variable, simultaneity and sample selection