

**Economics 470
Econometrics
Spring 2024**

**Jonathan B. Hill
Dept. of Economics
University of North Carolina -Chapel Hill**

1. Information

Instructor: Prof. Jonathan B. Hill

Office: Gardner 200F

Lecture: T,TH 12:30pm-1:45pm

Office Hours: T,TH 11:15-12:15 (or on Zoom by appointment)

jbhill@email.unc.edu

Canvas: <https://uncch.instructure.com/courses/48901>

TA: [Yi Ciu](#)

Office Hours [TH 3-5pm on Zoom: https://unc.zoom.us/j/7756412153](https://unc.zoom.us/j/7756412153)

2. Course Description and Goals

This course develops statistical and empirical methodologies for analyzing data in order to test economic and financial hypotheses, make policy recommendations, and forecast unknown events. We review statistical theory of estimation and hypothesis testing. We then proceed by studying classical linear regression theory: the theory and practice of building, estimating, and testing econometric models of economic data/information/behavior. The theoretical topics covered in the course prepares the students for more advanced topics associated with the econometrics analysis of economic behavior in, for example, labor economics, macroeconomics and finance. Throughout the course we will pay close attention to the details of conducting empirical work in economics and econometrics with real-world datasets using computational software. With this in mind, assignments will frequently focus on empirical and computational demonstrations of the theory studied in lecture.

Major goals and take-aways from this course are (1) the student's ability to do empirical research, and (2) the student's understanding of why econometric methods work.

3. Prerequisites

Students must have taken Econ. 400 and 410; a grade of C or better in Econ. 400 and 410 is required. A semester of calculus and Econ. 420 (macro) are helpful.

4. Questions for Students

As part of UNC's curricular "Ideas in Action", we pose the following questions:

- a. *How do I establish my point of view, take intellectual risks, and begin producing original scholarship or creative works?*
- b. *How do I narrow my topic, critique current scholarship, and gather evidence in systematic and responsible ways?*
- c. *How do I evaluate my findings and communicate my conclusions?*

5. Personal Electronic Devices

Unless explicitly authorized by me (the professor), you are not permitted to use a laptop, tablet, smart phone/watch, any smart-device, or cell phone during class. Watching movies and videos, playing games, checking the scores on espn.com, shopping, and chatting with your friends are disruptive behavior that will not be tolerated (I have actually seen all these things while visiting other professor's lectures). Checking texts is easily spotted (you may think you're hiding it, but you're not) and very disruptive and disrespectful. **No phone/smart-watch use allowed during class, unless approved by me (e.g. for insulin testing).**

6. Course Resources

Consult the Resources link in the Sakai course site for STATA resources, assignments and answer keys (once they are posted), practice exams, course data sets and online data set links.

7. Required Test Book

"Introductory Econometrics: A Modern Approach" 5th, 6th or 7th edition, by Jeffrey Wooldridge.

Browse the web for cheap versions (Ebay, etc).

8. Software

We will use STATA, a major econometrics software with command prompt (instantaneous commands, one-by-one) and programmable interface (for writing and storing code to run more detailed programs). Students must obtain STATA on their own: 30% of the course grade will be based on econometric software use. See below for options for obtaining STATA.

Students are required to use the STATA econometrics/statistics programming package. In principle you can use any version available to you, but I will only provide documentation for STATA. You need to obtain a copy of, or access to, **STATA BE (old IC) 16** or a similar recent version.

STATA SE 16 handles massive data sets and is therefore expensive. *We do not need such power!!*

STATA BE (old IC) is cheaper and handles less data than STATA SE, but it is perfectly adequate for all that we do. I use it!!! You can purchase **STATA IC** for \$95/year.

Go to [STATA Gradplan](#) to view options for *student purchases*.

BUY IT SOON: there will not be any homework extensions if you decide to wait.

If you want to buy it via UNC, go to [UNC Software Acquisition](#). Their links simply sends you to STATA's web-site. Alternately, you can use Stata on campus computers.

9. STATA Write-Up

Before you do any STATA write-up for homework assignments, consult the *Write-Up Examples* and the *STATA: Bad/Good Writeup* documents to see what clean, compact write-ups look like, and what bad write-ups look like. Since this is a 400-level course, grading on these write-ups will be very strict.

Your STATA grade will be based 50% on the accuracy of what you did, and 50% on the write-up itself.

NEVER JUST COPY-PASTE STATA OUTPUT: if all you do is copy-paste STATA output your grade will be 0. The main problem is the output looks terrible, and it always contains far more than was asked for. Also, it will likely always be the case you do not even recognize much of the output. Thus, take what STATA provides and condense and present the material in neat tables, or graphs, as the per the assignment.

NEVER REPORT OUTPUT YOU DO NOT UNDERSTAND. This goes with the above: if you do not understand the output, odds are you were not even asked to report it. Only report what you are asked to do. *And report that material very neatly.*

10. Course Structure

There will be two exams (midterm, final), and several (about 4) homework assignments based on econometric theory and based on using STATA. The breakdown follows:

Midterm Exam #1: 20%

Midterm Exam #2: 20%

Final Exam: 30%

Homework: 30%

Homework must be uploaded in **GRADESCOPE** (not in “Assignments” in Canvas).

Late homework assignments are never accepted, including legal/medical emergencies and school sanctioned events. Students can, however, turn homework in early. Homework cannot be emailed (I will delete the email without even reading the attached homework), cannot be placed in my mail box, nor placed under the door of my office. *There are no exceptions.*

A missed exam cannot be made up (because the exam problems and key are now public).

In case of emergencies, illness or school sanctioned events, with a valid excuse (i.e. written official documented proof) students may have their homework or exam grade re-weighted.

11. Tentative Lecture Schedule

Week	Topic	Chapter (text book)
1	Bivariate Regression Model	2.1-2.2
2-3	Properties of OLS Estimators	2.3-2.6
3-4	Multiple Regression Analysis	3, 4, 5
5-6	Model Selection, Transformations	6
	MIDTERM EXAM #1 (bivariate regression theory/practice)	
7	Dummy Variables	7
8-9	Heteroscedasticity	8
10-11	Serial Correlation	12.1-12.3, 12.5
	MIDTERM EXAM #2 (at least heterosc., serial correlation)	
12-13	Limited Dependent Variables and Sample Selection	17
13-14	Simultaneous Equations and Endogeneity Bias	16 (which uses 15)

12. Other Matters

14.1 ARS

Students who have worked out an arrangement with ARS should contact me so I can make accommodations. If you need extra time for exams, and have a provable “disability”, and have not already done so, please contact ARS (<https://ars.unc.edu>).

It is my goal to create an inclusive environment where anyone can speak out, share ideas, and provide feedback to me and their classmates. In some cases actual issues that arise in econometrics require an effort to maintain diversity and inclusivity (e.g. "gender" variables, and marital status prior to the landmark case allowing for all to marry), and it is my hope that all students will feel welcome in those, and all other, times.

14.2 CAPS

Students should be aware of UNC’s *Counseling and Psychological Services (CAPS)*: please visit <https://caps.unc.edu/> if you think their services fit your needs, or you need to find out who you should talk to.

14.3 Title IX

Title IX and the Violence Against Women Act (VAWA) are two of the federal laws that are focused on providing safe, inclusive, and welcoming learning and work environments on campus. Title IX prohibits sex discrimination and sexual harassment. Sexual assault and sexual violence are forms of sexual or gender-based harassment that are prohibited by Title IX. VAWA also requires Universities to address sexual violence, interpersonal violence, and stalking.

Please visit <https://eoc.unc.edu/> for further information.

14.4 Honor Code

All students implicitly agree to the Honor Code set forth by UNC. See <https://catalog.unc.edu/policies-procedures/honor-code/> .