

## **ECON 470 — Econometrics**

University of North Carolina at Chapel Hill, Spring 2024

### **Course information**

Instructor: Christopher Handy, [chandy@unc.edu](mailto:chandy@unc.edu)

Class meetings

ECON 470–001: Tuesday and Thursday, 12:30pm–1:45pm, Gardner 08

ECON 470–002: Tuesday and Thursday, 2:00pm–3:15pm, Gardner 08

Office hours: see schedule on Canvas

### **Course description**

Econometrics is the application of statistical methods and economic theory to the problem of identifying, estimating, and testing economic models. This course covers concepts and methods used in empirical economic research. You will learn how to conduct and how to critique empirical studies in economics.

Prerequisites: ECON 400 and 410 with a grade of C or better in both courses

### **Course objectives**

In this course you will ...

- study correlations and make comparisons using linear regression, and understand the conditions under which an estimated regression coefficient would have a causal interpretation;
- interpret and communicate the magnitude, economic significance, and statistical significance of econometric results;
- understand the usefulness and limitations of research designs aimed at isolating causal effects, and be able to implement the associated econometric analyses; and
- further develop skill in data management and programming by using statistical software to clean data, generate estimates, and write script files.

### **IDEAs in Action curriculum learning outcomes**

This course fulfills the Quantitative Reasoning focus capacity of the IDEAs in Action general education curriculum, which has the following learning outcomes.

1. Summarize, interpret, and present quantitative data in mathematical forms, such as graphs, diagrams, tables, or mathematical text.
2. Develop or compute representations of data using mathematical forms or equations as models, and use statistical methods to assess their validity.

3. Make and evaluate important assumptions in the estimation, modeling, and analysis of data, and recognize the limitations of the results.
4. Apply mathematical concepts, data, procedures, and solutions to make judgments and draw conclusions.
5. Synthesize and present quantitative data to others to explain findings or to provide quantitative evidence in support of a position.

## Materials

Recommended text: Wooldridge, *Introductory Econometrics: A Modern Approach*, any edition

Software: Stata/BE, available at [www.stata.com/order/new/edu/profplus/student-pricing/](http://www.stata.com/order/new/edu/profplus/student-pricing/), on Virtual Lab, and in campus computer labs

Website: Canvas, [uncch.instructure.com/courses/48891](http://uncch.instructure.com/courses/48891)

## Course components and grading

Your grade will be determined from the following components.

Participation	5%
Assignments	15%
Exam 1	20%
Exam 2	20%
Final exam	30%
Highest exam	10%

I will use the following grading scale, although I may curve numerical grades to higher letter grades at the end of the semester if needed.

A	[93, 100]	C+	[77, 80)
A–	[90, 93)	C	[73, 77)
B+	[87, 90)	C–	[70, 73)
B	[83, 87)	D+	[67, 70)
B–	[80, 83)	D	[60, 67)
		F	[0, 60)

*Participation:* You will answer questions in class using Poll Everywhere. Your participation score is based on whether you answer these questions; there is no penalty for incorrect answers. You can fail to respond to 15 percent of the poll questions before losing points on your participation score. I expect you to be in the classroom in order to answer these questions, and voting from outside the classroom could lead to you getting a zero for your entire participation score.

*Assignments:* The assignments will typically include a mix of analytical questions and empirical work for which you will use Stata. There will be six assignments, and tentative due dates will be posted on Canvas. I will drop the lowest assignment score before computing your assignment average. You must first attempt each assignment on your own. After that, you may work with classmates, but you may not simply share answers.

*Midterm exams:* There will be two in-class exams. The dates of these exams are on the schedule below.

*Final exam:* The final exam details for each section are listed below. You will have the opportunity in the last weeks of class to switch your exam time to the other section, if you would like. If you obtain an official exam excuse, you will take the exam with the other section if possible, or you will take the departmental make-up exam on Wednesday, May 8, at a time and place to be announced closer to that date.

ECON 470–001 (meeting TR 12:30pm): Monday, May 6, 4:00–7:00pm, Gardner 08

ECON 470–002 (meeting TR 2:00pm): Friday, May 3, 12:00–3:00pm, Gardner 08

*Highest exam:* I will use the highest of your three exam scores (exam 1, exam 2, and final exam) for this component of your grade.

### **Academic policies**

*Attendance:* I expect you to attend class if you are able, and to prepare for class by doing any assigned reading and watching any assigned videos. I will post a recording of each day's class, and you should watch it if you have to miss class for any reason. See also the university's [Class Attendance Policy](#).

*Conduct:* Please respect your fellow students by behaving professionally. This includes arriving on time, not leaving class unnecessarily, and not distracting others.

*Honor code:* I expect you to follow the guidelines of the UNC honor code; each of you has pledged "not to lie, cheat, or steal." Collaboration is encouraged on assignments but prohibited on exams. You may not consult materials from any previous offering of this course for any reason, and I expect you not to share materials with any future students of this course. Lying or cheating could result in a failing or zero score for your participation grade, for an assignment or exam, or for the course as a whole. If you have questions about the honor code, please ask me or consult the [Honor System webpage](#).

*Late assignments:* Assignments are accepted up to 24 hours after the deadline with no penalty, and are not accepted after that. I know that things like personal emergencies or computer problems may prevent you from submitting an assignment, which is why I drop the lowest assignment score before computing your assignment average. Exceptions to this policy will generally only be made if you accumulate University Approved Absences covering a significant amount of time.

*Missed exams:* If you miss a midterm exam and you have a University Approved Absence, I will replace the grade on that exam with the average of your future exam grades. For the final exam, the university policy is that you may only take the exam outside the scheduled time if you have an official final exam excuse, and requests involving religious observance or a scheduling conflict must be made no later than the final day of classes. Exams missed without an official approval or excuse will generally receive a grade of zero.

*Syllabus changes:* I reserve the right to make changes to the syllabus, including assignment due dates and exam dates. These changes will be announced as early as possible.

### **Academic resources and student support**

*Accessibility Resources and Services:* ARS ([ars@unc.edu](mailto:ars@unc.edu)) receives requests for accommodations, and through the Student and Applicant Accommodations Policy determines eligibility and identifies reasonable accommodations for students with disabilities and/or chronic medical conditions to mitigate or remove the barriers experienced in accessing University courses, programs and activities. ARS also offers its Testing Center resources to students and instructors to facilitate the implementation of testing accommodations.

*Counseling and Psychological Services:* UNC–Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

*Title IX resources:* Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC or by contacting the University's Title IX Coordinator (Elizabeth Hall, [titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)). Confidential resources include Counseling and Psychological Services and the Gender Violence Services Coordinators ([gvsc@unc.edu](mailto:gvsc@unc.edu)). Additional resources are available at [safe.unc.edu](http://safe.unc.edu).

### Schedule of topics and exams

<u>Date</u>	<u>Topic</u>
Thursday, Jan. 11	Potential outcomes and causality
Tuesday, Jan. 16	Statistics preliminaries
Thursday, Jan. 18	Statistics preliminaries
Tuesday, Jan. 23	Simple regression
Thursday, Jan. 25	Simple regression
Tuesday, Jan. 30	Simple regression
Thursday, Feb. 1	Simple regression
Tuesday, Feb. 6	Multiple regression
Thursday, Feb. 8	Multiple regression
Tuesday, Feb. 13	Well-being day
Thursday, Feb. 15	Catch up or review
Tuesday, Feb. 20	<b>Exam 1</b>
Thursday, Feb. 22	Multiple regression
Tuesday, Feb. 27	Multiple regression
Thursday, Feb. 29	Regression inference and robust standard errors
Tuesday, Mar. 5	Regression inference and robust standard errors
Thursday, Mar. 7	Regression inference and robust standard errors
March 11–15	Spring break
Tuesday, Mar. 19	Binary dependent variables
Thursday, Mar. 21	Binary dependent variables
Tuesday, Mar. 26	Measurement error
Thursday, Mar. 28	Well-being day
Tuesday, Apr. 2	Catch up or review
Thursday, Apr. 4	<b>Exam 2</b>
Tuesday, Apr. 9	Panel data I: Differences in differences
Thursday, Apr. 11	Panel data I: Differences in differences
Tuesday, Apr. 16	Panel data II: First differences and fixed effects
Thursday, Apr. 18	Panel data II: First differences and fixed effects
Tuesday, Apr. 23	Instrumental variables
Thursday, Apr. 25	Instrumental variables
Tuesday, Apr. 30	Catch up or review
Friday, May 3	<b>Final exam for section 2</b> (12–3pm, Gardner 08)
Monday, May 6	<b>Final exam for section 1</b> (4–7pm, Gardner 08)