ECON 400 — Introduction to Statistics and Econometrics

University of North Carolina, Fall 2021

Course information

Instructor: Christopher Handy, chandy@unc.edu

Class meetings
    ECON 400–001: Tuesday and Thursday, 2:00pm–3:15pm, Stone Center 103
    ECON 400–002: Tuesday and Thursday, 3:30pm–4:45pm, Stone Center 103

Office hours: see information on Sakai

Course description

This course is a comprehensive introduction to statistics, including descriptive statistics and statistical graphics, probability theory, distributions, parameter estimation, hypothesis testing, simple and multiple regression, and use of powerful statistical estimation software. This course includes a substantial introduction to basic econometrics.

Prerequisites: ECON 101, STOR 155, and one of MATH 152, 231, STOR 112, 113

Course objectives

In this course you will:

1. Use random variables to describe distributions and their key characteristics.
2. Describe an estimator as a random variable, and use its sampling distribution to characterize important properties of the estimator.
3. Construct confidence intervals, perform hypothesis tests, and correctly interpret both.
4. State the sense in which a linear regression coefficient is a comparison, and the conditions under which this comparison would have a causal interpretation.
5. Use statistical software to manipulate data, produce descriptive statistics, and estimate linear regression models.
6. Given context, data, and a research question, choose and implement the appropriate description or inference to answer the question.

Materials

Text: OpenIntro Statistics, available cheaply at www.openintro.org/book/os/

Software: Stata/BE, available at www.stata.com/order/new/edu/profplus/student-pricing/ and in campus computer labs

Website: Sakai, sakai.unc.edu

Course components and grading

Your grade will be determined from the following components.

Participation	5%
Assignments	25%
Exam 1	20%
Exam 2	20%
Final exam	30%

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 most class meetings using Poll Everywhere. Your participation score is based on whether you answer these questions; there is no penalty for incorrect answers. I expect you to be in the classroom in order to answer these questions. I will drop the lowest three days of participation scores before computing your participation average.

Assignments: The assignments will typically include a mix of traditional questions and empirical work for which you will use Stata. There will be approximately six assignments, and tentative due dates are included on the schedule below. 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 are on the schedule below.

Final exam: The final exam dates and times below have been set by the university registrar.
    ECON 400–001 (meeting TR 2:00pm): Tuesday, December 7, 12:00–3:00pm
    ECON 400–002 (meeting TR 3:30pm): Saturday, December 4, 4:00–7:00pm

Academic policies

Attendance: I expect you to attend class and to prepare for class by doing any assigned reading and watching any assigned videos. I will monitor attendance through Poll Everywhere responses, which should only be submitted if you are in the classroom. I will post a recording of each day's class, and you should watch it if you have to miss class for any reason. As noted above, I will drop the lowest three days of participation scores before computing your participation grade. Exceptions to this policy will generally only be made if you accumulate more than three class days of University Approved Absences.

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." 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. If you an unsure whether a particular action violates the honor code, please ask me or consult honor.unc.edu.

Late assignments: Assignment due dates are firm. 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 a significant number of University Approved Absences.

Missed exams: To take a midterm exam outside the scheduled time, you must have a University Approved Absence and reach out to me promptly. 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 for any other reason will generally receive a grade of zero.

Recitations: The recitation sections are opportunities for you to get additional practice, gain familiarity with Stata, and ask questions in a smaller setting. I strongly encourage you to attend recitations, and any material covered there may appear on an exam. You may attend the recitation section of your choice, space permitting, and the full recitation schedule is posted on Sakai.

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.

University mask policy: This semester, while we are in the midst of a global pandemic, all enrolled students are required to wear a mask covering your mouth and nose at all times in our classroom. This requirement is to protect our educational community — your classmates and me — as we learn together. If you choose not to wear a mask, or wear it improperly, I will ask you to leave immediately, and I will submit a report to the Office of Student Conduct. At that point you will be disenrolled from this course for the protection of our educational community. Students who have an authorized accommodation from Accessibility Resources and Service have an exception. For additional information, see Carolina Together.

Academic resources and student support

Accessibility Resources and Services: The University of North Carolina at Chapel Hill facilitates the implementation of reasonable accommodations, including resources and services, for students with disabilities, chronic medical conditions, a temporary disability or pregnancy complications resulting in barriers to fully accessing University courses, programs and activities. Accommodations are determined through the Office of Accessibility Resources and Service (ARS) for individuals with documented qualifying disabilities in accordance with applicable state and federal laws. See the ARS Website for contact information or email ars@unc.edu.

Counseling and Psychological Services: CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

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. Please contact the University's Title IX Coordinator (Elizabeth Hall, interim, titleixcoordinator@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at safe.unc.edu.

Schedule of topics and assessments

Week	Dates	Tuesday	Thursday	Sunday
1	Aug. 16–22		Introduction	
2	Aug. 23–29	Summarizing data	Probability	
3	Aug. 30–Sep. 5	Probability	Discrete random variables	PS 1 due
4	Sep. 6–12	Discrete random variables	Continuous random variables	
5	Sep. 13–19	Continuous random variables	Joint and conditional distributions	PS 2 due
6	Sep. 20–26	Catch-up and review	**Exam 1**	
7	Sep. 27–Oct. 3	Joint and conditional distributions	Point estimates and sampling distributions	
8	Oct. 4–10	Point estimates and sampling distributions	Confidence intervals	PS 3 due
9	Oct. 11–17	No class: University Day	Hypothesis tests	
10	Oct. 18–24	Hypothesis tests	No class: Fall Break	PS 4 due
11	Oct. 25–31	Catch-up and review	**Exam 2**	
12	Nov. 1–7	Simple regression	Simple regression	
13	Nov. 8–14	Multiple regression	Multiple regression	PS 5 due
14	Nov. 15–21	Regression topics	Regression topics	
15	Nov. 22–28	Regression topics	No class: Thanksgiving	PS 6 due
16	Nov. 29–Dec. 5	Catch-up and review		