UNIVERSITY OF NOTRE DAME
Department of Economics
Spring 2023

ECON 30331-02: Econometrics
Monday/Wednesday, 11:00-12:15, 136 DeBartolo Hall

Prof. Kasey Buckles, Ph.D.
E-mail: kbuckles@nd.edu
Office: 3052 Jenkins-Nanovic Hall
Office Hours: Tuesday, 10:30-12:00, or by appointment.
  In-person and Zoom options (send calendar invite for Zoom).

Econometrics is a set of statistical and analytical tools that social scientists use to learn from real-world data. Economists use econometrics to test the predictions of economic models, to identify relationships and patterns in data, and to estimate the causal effects of actions, events, and policies.

The core of the course will be a discussion of regression analysis (specification, estimation, and hypothesis testing), and the problems and pitfalls in its application in economics and other social science fields. I will provide an overview of how to carry out and interpret empirical research, using both theory and practice. While I will use the language of math and statistics to present much of the material, I will also help you to gain an intuitive understanding of the principles at work.

On successful completion of this course you should be a thoughtful consumer and a careful practitioner of social science research, and will be equipped with analytical tools that are valued by employers and quantitative graduate programs. You will also learn to use the statistical software package Stata. Doing well in this course will therefore serve you very well, but doing so will not be easy. Most students find the course to be rigorous and demanding. We will move quickly and cover a large amount of material. I advise you to prepare for class and keep up with the material, as the course does not lend itself to memorization or all-night cram sessions.

Statistics for Economics is a prerequisite for this course, although comparable courses or a sufficient math background may substitute. You will need to be able to do basic derivatives, and be familiar with the concepts of hypothesis testing, and the properties of the expectation, variance, and covariance operators. To gauge your understanding of the prerequisites, you should consult Appendices A, B, and C of the Wooldridge text to see whether you are familiar with the material contained therein. I urge you to talk to me during the first week of class if you are concerned about your level of preparation.

Texts: 1) Wooldridge, <u>Introductory Econometrics: A Modern Approach</u>. 7th ed, 2019. Required. Prior editions should work with only very minor adjustments. You can also access the text using the subscription service "Cengage Unlimited." You may also have a version of the book that includes access to MindTap content for the course, including practice problems and some instructional videos. This content is strictly optional but you are welcome to use it if it you find it helpful.

2) Angrist and Pischke, <u>Mastering 'Metrics</u>. 2015. (Optional, but provides an intuitive, alternative approach.)

Canvas: Our website within Canvas will have handouts, data sets, class notes, assignment information, and more. I may also use it to collect assignments.

Stata: You will be required to use the statistical software package *Stata* for this course. It is available in all classrooms and clusters on campus, but you can also purchase a license at a discounted rate through GradPlan. See the Stata Resources module in Canvas for more information.

Laptop policy: Please do not use laptops in class, unless they are in tablet (note-taking) mode. I will usually write on the board for lectures, with lots of symbols and equations, so a laptop keyboard is not useful for note-taking. If you would like to request an exemption from this policy, please contact me during the first week of class.

Peer tutoring: The Department of Economics sponsors a peer tutoring lab for core courses, including Econometrics. Tutors will be available on a drop-in basis for question and answer sessions on Monday, Tuesday, and Wednesday from 6:30-8:30pm in Jenkins Nanovic Halls B052, beginning January 23rd.

Requirements and grading weight: Final grades will be curved at the end of the semester, to achieve a distribution that is roughly 40% A/A-; 40% B+/B/B-; 20% C or below. Grades will be based on the following:

> **Problem sets (30%):** You will be assigned six problem sets. The problem sets are designed to serve two main purposes. First, they will prepare you for exams by allowing you to test your understanding of the material. Second, they will prepare you for the course project by allowing you to practice using Stata. Many people find that small group discussions help with their understanding. *Thus, you are allowed to form a group of up to four people to work on the problem sets.* Each group will turn in one copy and everyone will receive the same grade. By putting your name on the group work, you are acknowledging not only that you and everyone else in the group did their fair share, but also that you understand how the group arrived at all of the answers. Thus, it is *not acceptable* to simply split the problem set questions up among the group and then staple the answers together at the end. You are not required to stick with the same group for every assignment.

> **Course project (10%):** There will be a written project due **in class on Monday, April 17**. The project will consist of carrying out an empirical project and writing up the results in the form of a research paper. Further details on the nature of the project will be provided before Spring Break. Generally, the course project is designed to give you a feel for working on a real research question, and thus to help better prepare you for carrying out your own inquiries. *You are required to work in groups of three or four.* You should identify your group by March 8; if you cannot find a group I will assign you one. While it may be reasonable to split up writing duties, the overall approach and interpretation of the results needs to be fully discussed among the group members. Again, your name on the paper is an acknowledgement that everyone in the group did their fair share and understands what was done.

> **Exams (60%, or 20% each):** There will be two in-class exams and a comprehensive final exam. Each midterm will cover a third of the course, and the final will be cumulative with an emphasis on material from the last third of the course. Attendance for exams is ABSOLUTELY mandatory—including the final, which will be given on **Tuesday, May 9, 4:30-6:30 p.m.** *Do not schedule travel or other conflicts during exam times.* Only university-approved absences will be allowed (death in the immediate family, sickness resulting in hospitalization), and I will require verification. Unexcused absences will earn you a zero on the exam. I will have extended office hours before each of the two midterms.

Attendance and participation: While no grade is explicitly given for attendance, it will be difficult to do well in this course without regular attendance. Also, good participation helps "on the margin" when it comes to final grades. Barring unforeseen circumstances, I will not be "Zooming" or recording the class.

Ungraded homework assignments: At the end of most classes, I will assign a few problems from Wooldridge as homework for the next class. We will begin the following class by going over these problems. While I will not collect or grade these, doing the homework between classes is the single best thing you can do to stay on top of the material and do well in the course.

Honor Code information: In signing the university's honor code, you agreed not to participate in or tolerate academic dishonesty. I expect you to adhere to this strictly, and any violations will be reported to the Associate Provost. You may work in groups on problem sets and the project as outlined above. Please ask if you have any questions or need clarification about the expectations.

Privacy: As a learning community, we are collectively responsible for upholding privacy protection standards. While there has always been a need to maintain and respect each other's privacy, it is especially important as aspects of our teaching and learning have moved online, beyond the traditional confines of the classroom. As your instructor, I am committed to protecting your privacy by only using University-approved course technologies and adhering to Family and Educational Rights and Privacy Act (FERPA) guidelines. This includes only using your educational data for legitimate educational purposes and only sharing that with the University for legitimate purposes (for instance, submitting your final grades to the Registrar). As learning community members, I ask that each of us commit to the following basic privacy protection standards:
- Do not pin, take screenshots, or share video of our class sessions or any recorded lectures, and do not share discussion thread posts from Canvas.
- Do not post images or identifiable conversations that occur in class to social media or to those beyond our learning community (this violates both general privacy and FERPA standards).

COVID-related policies: The expectation is that we will all comply with university guidelines at all times, including by wearing masks indoors when required.

Lauren's Promise: I will listen and believe you if someone is threatening or harassing you.

Lauren McCluskey, a 21-year old student at the University of Utah and the daughter of economist Jill McCluskey, was murdered on Oct. 22, 2018 by a man she briefly dated. I am committed to doing what I can to make sure this does not happen again.

If you are in immediate danger, call 911. If you are experiencing sexual assault, domestic violence, stalking, or harassment you can report it to me. You should be aware that I am a mandatory reporter, which means that I am required to report these instances to the university's Title IX Coordinator or Deputy Title IX Coordinator to investigate. **You can also learn about your options (on-campus and off-campus, confidential and not) at http://titleix.nd.edu.**

If you are in need of support for your mental or emotional health for any reason, you can talk to me. You can also find helpful resources at https://studentaffairs.nd.edu/be-well/. Sara Bea Accessibility Services can assist with academic accommodations for students with disabilities. The Writing Center, Gender Relations Center, Multicultural Student Services and Programs, and International Student and Scholar Affairs are also available on campus.

Schedule

(subject to change)

Date		Topic	Wooldridge Chapter	Assignment Due
Jan.	18	Introduction & Data	1	
	23	Simple Regression	2	
	25	Simple Regression	2	
	30	Multiple Regression	3 (+ A&P Ch. 1&2)	
Feb.	1	Multiple Regression	3 (+ A&P Ch. 1&2)	Problem Set 1
	6	Multiple Regression	3 (+ A&P Ch. 1&2)	
	8	Inference	4	
	13	Inference	4	
	15	Dummy Variables	7	Problem Set 2
	20	Asymptotics, Review	5	
	22	**MIDTERM 1, in class**		
	27	NO CLASS		
Mar.	1	Further Issues	6	
	6	Heteroskedasticity	8	
	8	Heteroskedasticity	8	Problem Set 3
	20	Specification and Data Problems	9	
	22	Specification and Data Problems	9	
	27	Instrumental Variables	15 (+ A&P Ch. 3)	
	29	Instrumental Variables	15 (+ A&P Ch. 3)	Problem Set 4
Apr.	3	Applications		
	5	**MIDTERM 2, in class**	A&P Ch. 4	
	10	NO CLASS – EASTER MONDAY		
	12	Regression Discontinuity	A&P Ch. 4	
	17	Regression Discontinuity	A&P Ch. 4	Project
	19	Panel Data	13, 14 (+ A&P Ch. 5)	
	24	Panel Data	13, 14 (+ A&P Ch. 5)	Problem Set 5
	26	Panel Data	13, 14 (+ A&P Ch. 5)	
May	1	Time Series	10, 11, 12	Problem Set 6
	3	Applications		
	9	**FINAL EXAM, 4:30-6:30**		