

ECO 5420: Applied Econometrics

Fall 2023

Prof. Luke Rodgers

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Office: Bellamy 279

Class times:

Tu/Thu 1:20-2:35pm, BEL 203

Office Hours:

Tu 1030am-1130am

Course Overview

The purpose of this course is to provide graduate students with the basic tools to analyze cross-sectional and panel data. The course includes a general overview of the most common regression analysis techniques and examples of their applications. We will discuss properties of the ordinary least squares (OLS) estimator, how to interpret regression results, and how to perform hypothesis testing. This course will also cover more advanced topics, including instrumental variables estimation, panel data methods, and limited dependent variable (e.g., binary response) models. Although we will focus on the practical usefulness and intuition behind various estimation methods, some degree of technicality should be expected. By the end of the course you should be able to select an estimation method that is most appropriate for answering a particular policy question, formulate and estimate econometric models, test hypotheses, and interpret regression results.

Textbook

Wooldridge, Jeffrey M. *Introductory Economics: A Modern Approach*, 7th Edition. Feel free to use an earlier version. I also highly recommend *Mastering Metrics* as a companion reader.

Canvas

I will post all course material (problem sets, datasets, etc.) on Canvas. I will also use Canvas to make out-of-class announcements, so please set your notifications accordingly.

Grades

Grades will be computed as follows:

- 30% Problem sets
- 30% Midterm
- 40% Final Exam

There will be five problem sets during the semester, each worth 6% of your course grade. A late submission within 24 hours of the deadline will receive a 50% penalty; submissions after that will receive a zero. You are permitted to discuss these assignments with others, though you should first fully attempt them on your own. You must submit independent work. The last problem set will be a group project, where both the group members and topic will be randomly assigned. Each group will present their results to the class.

Course grade cut-offs	
94 and above	A
90 – 93	A-
87 – 89	B+
84 – 86	B
80 – 83	B-
77 – 79	C+
74 – 76	C
70 – 73	C-
67 – 69	D+
64 – 66	D
60 – 63	D-
Below 60	F

Problem sets will include theoretical questions as well as computer exercises in Stata. Stata is available on the computers in the graduate computer lab and on the FSU virtual lab (<https://its.fsu.edu/services/it-professional-services/myfsuvm>). If you like, you may also purchase a discounted student Stata license for use on your personal computer from the Stata website.

There are two closed-note, closed-book exams. The midterm will be administered during class, tentatively on October 12th (subject to change). There will be no make-up midterms; however, if you

provide documentation of a valid absence (e.g., serious health problem) I will reweight your final exam to be 70% of your total course grade. The final exam will be cumulative. Please pay attention to Canvas and in-class announcements for due dates and exam periods. There are no make-up finals. If you have a legitimate scheduling conflict please contact me no later than one week before the scheduled final exam time. If you have a medical emergency that may cause you to miss the final, please email me immediately and provide a doctor's note. There is no extra credit.

Class attendance is not required, but it is *highly encouraged*. Even though class participation is not explicitly graded, students who are prepared, engaged (e.g., participating in class discussions, not "multitasking" on their phones/computers), and motivated will receive the benefit of the doubt if their cumulative scores are on the fence between letter grade cutoffs. While it is also not required, I will make a note of students who demonstrate their effort and interest via discussion boards (e.g., posting a helpful response to a classmate's question).

Communication

Everyone is welcome to drop by my office to ask questions during my posted office hours. No appointment is necessary, but letting me know ahead of time helps me manage the queue. Although I highly recommend troubleshooting difficult material in-person, I will check my email and Canvas regularly. If you have a question about the course material and are unable to attend office hours, I strongly encourage you to use the relevant discussion board on Canvas *before* emailing me: similar questions and responses may have already been posted there. Either way, I will do my best to respond to emails in a timely fashion. Emails received before 6pm will receive priority attention.

Course Outline

- I. Basic Regression Concepts – Chapters 1, 2, 3, and 7
 - a. Basic concepts – probabilities, statistics
 - b. Simple and multiple regressions
 - c. Dummy variables
- II. Using Ordinary Least Squares (OLS) – Chapters 4 and 8
 - a. Foundational assumptions
 - b. Thinking about bias, omitted variables
 - c. Hypothesis testing
 - d. Heteroskedasticity
- III. Instrumental variables (IV) estimation with two stage least squares (2SLS) – Chapter 15
 - a. Motivation for using instrumental variables – endogeneity
 - b. How to perform IV estimation via 2SLS
 - c. Potential problems with IV/2SLS estimation
 - d. Testing for endogeneity and checking validity of the instruments
- IV. Panel data methods – Chapters 13 and 14
 - a. Pooling independent cross sections over time
 - b. Policy analysis and difference-in-differences estimator
 - c. First-difference estimator
 - d. Fixed effects and random effects estimators
- V. Limited dependent variable models and sample selection corrections – Chapters 7 and 17
 - a. Linear probability model
 - b. Logit and probit models for binary response
 - c. Goodness-of-fit measures for binary response models
 - d. Binary response models for panel data

University Attendance Policy

Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid written excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “. . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>)

Academic Success

Your academic success is a top priority for Florida State University. University resources to help you succeed include tutoring centers, computer labs, counseling and health services, and services for designated groups, such as veterans and students with disabilities. The following information is not exhaustive, so please check with your advisor or the Department of Student Support and Transitions to learn more.

Americans With Disabilities Act

Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Office of Accessibility Services; and (2) request a letter from the Office of Accessibility Services to be sent to the instructor indicating the need for accommodation and what type; and (3) meet (in person, via phone, email, skype, zoom, etc...) with each instructor to whom a letter of accommodation was sent to review approved accommodations. This syllabus and other class materials are available in alternative format upon request. For the latest version of this statement and more information about services available to FSU students with disabilities, contact the:

Office of Accessibility Services
874 Traditions Way
108 Student Services Building
Florida State University Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
oas@fsu.edu
<https://dsst.fsu.edu/oas>

Confidential campus resources

Various centers and programs are available to assist students with navigating stressors that might impact academic success. These include the following:

Victim Advocate Program University Center A, Room 4100, (850) 644-7161, Available 24/7/365, Office Hours: M-F 8-5 https://dsst.fsu.edu/vap	Counseling & Psychological Services Askew Student Life Center, 2ndFloor, 942 Learning Way (850) 644-8255 https://counseling.fsu.edu/	University Health Services Health and Wellness Center (850) 644-6230 https://uhs.fsu.edu/
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Free Tutoring from FSU

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options –see <http://ace.fsu.edu/tutoring> or contacttutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.

Syllabus Change Policy

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Suggested Syllabus Statements

Public Health Protocols – updated August 2023

Classes are expected to continue to meet in person this semester. If necessary, however, we will shift to remote instruction. There are currently no mask mandates in place at FSU, but it is likely that not everyone in class will feel the same way about public health protocols. Some members of our community remain more at risk than others. We encourage everyone to be patient with one another while we navigate these ongoing challenges.

While the Covid and M-pox pandemics are receding, in order to continue meeting in person, we must all work together as a community to protect one another and to promote our shared health and safety in indoor spaces. FSU will continue to monitor all public health issues. Whatever happens, we are committed to helping you learn the material thoroughly and stay on schedule with your degree program. You can find up-to-date guidance at: <https://stayhealthy.fsu.edu>