

Econ 4223: Econometric Analysis

University of Oklahoma
Fall 2023

Instructor: Judith Liu
Email: judith.liu@ou.edu
Office: Cate Center One 430
Office Hours: Tue/Thu 3:00 - 4:00 pm, or by appointment

Class Location: Cate Center One 338
Class Times: Tue/Thu 4:30 - 5:45 pm

Final Exam Location: Cate Center One 338
Final Exam Time: Mon, Dec 11, 4:30 - 6:30 pm

Teaching Assistant: TBA
Email: TBA@ou.edu
Office: TBA
Office Hours: TBA

Course Description

This course is designed to help students learn the conceptual and statistical machinery that form the foundation of economic research. The course will also help students develop skills in using computer software to perform data analyses.

Student Learning Outcomes

By the end of the course, students should be able to do the following:

1. Demonstrate an understanding of the theoretical foundations of estimating and testing the basic regression model, employing tools from statistics (including calculus).
2. Perform basic regression and testing procedures using the R programming language
3. Complete an empirical research project that includes the following elements
 - Formulate an econometric model.
 - Collect and prepare relevant data for use in estimating the model.

- Use appropriate methods of estimation.
- Test relevant behavioral hypotheses.
- Understand and test the Gauss-Markov assumptions.
- Analyze and interpret the estimated model.
- Prepare a written report summarizing the research results.

For further detail on course content, see the course schedule at the end of this document. This is a 3-credit-hour course, which means we will have about 3 hours per week of class. You should expect to spend, on average, another 4-6 hours per week outside of class on reading, preparation, homework, and review.¹

Prerequisites

- Econ 1113 (Principles of Macroeconomics)
- Econ 1123 (Principles of Microeconomics)
- Econ 2843 (Elements of Statistics)

Textbook and other materials

Materials for the course will be assigned from the following sources:

1. The e-textbook for this course will be MindTap for *Introductory Econometrics: A Modern Approach* (7th ed.), by Jeffrey M. Wooldridge. This has been selected for the OU Inclusive Access program, which provides less expensive digital course materials, easier purchase, and direct delivery through Canvas. All OU Inclusive Access digital course materials are provided to enrolled students on or before the first day of class when you login to Canvas. They are listed at your campus bookstore, but no further action is needed to purchase them. Your student Bursar account will be charged directly for these digital materials at a significant discount. You have the opportunity to opt-out of this program; however, the digital course materials are required, are necessary for maximum success in this course, and are not available anywhere for a lower price.²
2. *R for Data Science* (by Hadley Wickham and Garrett Grolemund), e-Book available for **free here** (paperback copy available from Amazon for \$18.17).
3. *Using R for Introductory Econometrics* (by Florian Heiss), e-Book available for **free here** (paperback copy available from Amazon for \$26.90).
4. *Econometrics in R* (by Grant V. Farnsworth), reference guide (PDF) available for **free here**.

¹From OU's "How to Graduate a Sooner" webpage: "On average, you should expect to spend 2-3 hours outside of class studying for each credit hour you are taking." (http://www.ou.edu/graduatesooner/resources/graduate_a_sooner.html)

²Enroll in your MindTap course in 3 easy steps: (1) Log into your Canvas account and click on the link for this course (you will not need a course key to register for MindTap). (2) Click any link to Cengage content to continue the registration process. Your Cengage course materials will open in a new tab or window, so be sure pop-ups are enabled. (3) Link your Canvas account to your Cengage account. If you don't yet have a Cengage account, you can create one by clicking 'Create an Account'. We highly recommend using your school email address!

Course website

Class announcements and homework will be posted on the course website on Canvas: <https://canvas.ou.edu>. It is your responsibility to check the site regularly—at least every day class is held. All important announcements will be posted there.

Grading policies

Your grade will be determined by the following criteria:

- Problem sets (15%)
 - 6 problem sets throughout the semester; lowest score will be dropped. Consist of proofs, derivations, and empirical exercises in R. You may work on these in groups but you must turn in an individual copy.
- Class participation (25%)
 - Open-book reading quizzes taken online (due every Tuesday; lowest two scores will be dropped).
 - In-class activities.
- Midterm exam (15%)
- Comprehensive final exam (20%)
 - The final exam will be cumulative, and it will account for 20% of the course grade. Students whose final exam score exceeds their midterm score will receive the final exam score for the midterm exam if the midterm score was lower. **Students who do not take the final exam will receive a zero for both the Midterm and the Final.**
- An original econometric research paper (25%); more details on Canvas
 - Proposal (due during approximately the 5th week of the semester—see assignment schedule at end of this document and on Canvas).
 - Initial R analysis file (due during approximately the 9th week of classes).
 - Polished initial draft (due during approximately the 11th week of classes and distributed to another class member).
 - Reading and commenting on a fellow student's draft (due during approximately the 12th week of classes).
 - 3–5 minute in-class presentation of findings.
 - Final draft (due on the last day of class).

Exam regrading Exams are graded carefully and original grades are rarely changed. If you believe that a grading mistake was made on your work, you can submit a written request for a regrade to me within one week of its return. This request must contain a detailed explanation of the grading errors. Your entire exam will be regraded and the score may go up or down as a result.

N.B. I do not release end-of-course grades before they are posted by the Registrar. Federal regulations prohibit me from revealing any grade to you by email. Grades will be updated on the course website on Canvas throughout the semester.

Grading scale

At the end of the course, I will compute a final percentage grade based on component percentages of each grade category using the weights given above. I will then convert this final percentage grade into letter grades according to the following scale (where g indicates your final percentage grade):

$90\% \leq g$	$\leq 100\%$	A
$80\% \leq g$	$< 90\%$	B
$70\% \leq g$	$< 80\%$	C
$60\% \leq g$	$< 70\%$	D
$0\% \leq g$	$< 60\%$	F

I reserve the right to scale upwards everyone's final percentage grades by a common factor (e.g. 1.1), but the course will not be graded on a curve, and no one's final percentage grade will be lowered.

Classroom etiquette

I value your presence in my class, and I want your classmates to feel the same way. You are welcome to eat/drink during class as long as food/drink is permitted in the classroom and you do not disrupt or distract others by doing so. Note that smoking is prohibited on all OU property. Please silence your cell phones, pagers, or other electronic devices during class, and do not use them in the classroom. If you need to respond to a text/social media message, or make a phone call, please leave the classroom before doing so. You should bring your laptop to class (if you have one), as we will do in-class exercises almost every class period. Please do not use your laptop for work that is not directly related to what we are doing in class. Doing so has been scientifically proven to reduce your own academic performance, as well as that of your peers.³

Contacting me

I will always be available during my office hours. You may also stop by my office anytime my door is open. If you would like to meet with me outside of class but are unable to make it during my office hours, please do not hesitate to email me to make an appointment.

If you ever need to email me or any other professor at OU, please follow the basic rules contained at the following link: <http://www.jamestierney.com/teaching/how-to-email-a-professor/>

I will promise to reply to your email within 48 hours of your sending it.

³See, for example, [this NYT column](#).

Course Policies

Late Work

All work should be turned in on the date/time it is due. Late work will be accepted with a 20% penalty but will not be accepted one day following the due date. Work submitted more than 10 minutes after the deadline is considered late.

Make-up Policy

There will be no makeup exams without acceptable documentation showing you have a legitimate excuse for missing the exam. These reasons include illness, family-related issues/emergencies, and required participation in a university-sanctioned event. Students who need to miss an exam must let me know in advance.

Absences

Absences from class will only be excused for university approved reasons, illnesses, or other unforeseen emergencies.

University Policies

Religious Observance

It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

Reasonable Accommodation Policy

If a student requires an accommodation based on disability, the student should meet with me in my office during the first week of the semester. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels. The Disability Resource Center is located in the University Community Center at 730 College Avenue (405-325-3852).

Academic Integrity

I do not tolerate academic misconduct, and neither does the University of Oklahoma:

“Academic misconduct is cheating. More precisely, it is any action that a student knows (or should know) will lead to the improper evaluation of academic work. If the professor does not detect it, academic misconduct defeats the purpose of academic work because you are pretending to know more or write better than you actually do.

...

“At OU, acts of plagiarism can receive institutional penalties ranging from a letter of reprimand to required coursework to expulsion. All academic misconduct offenses

also receive grade penalties determined by the instructor. Grade penalties are not restricted to the value of the assignment and may be up to an F in the course. Juniors and seniors who plagiarize any significant portion of a paper should expect at least a suspension for a spring or fall semester. Under the right circumstances even freshmen and sophomores may also receive suspensions or even be expelled for plagiarism.”

—http://integrity.ou.edu/files/nine_things_you_should_know.pdf

For further information on what constitutes academic misconduct, as well as how such misconduct is punished, please consult the Student Guide to Academic Dishonesty, found at the following link:

<https://integrity.ou.edu/students.html>

I will not hesitate to fail students who do not fully comply with the University’s academic misconduct policy. If you find yourself contemplating cheating, plagiarism, or other forms of academic misconduct, please come see me first. Help is available if you are struggling. I want everyone in the class to try their best and to do their own work. Please be advised that I reserve the right to utilize anti-plagiarism resources such as *TurnItIn* when grading assignments.

Title IX Resources and Reporting Requirement

For any concerns regarding gender-based discrimination, sexual harassment, sexual assault, dating/domestic violence, or stalking, the University offers a variety of resources. To learn more or to report an incident, please contact the Sexual Misconduct Office at (405) 325-2215 (8 to 5, M-F) or smo@ou.edu. Incidents can also be reported confidentially to OU Advocates at (405) 615-0013 (phones are answered 24 hours a day, 7 days a week). Also, please be advised that a professor/GA/TA is required to report instances of sexual harassment, sexual assault, or discrimination to the Sexual Misconduct Office. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator at (405) 325-3546 or bjm@ou.edu. For more information, visit <http://www.ou.edu/eoo.html>.

Adjustments for Pregnancy/Childbirth Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me or the Disability Resource Center at (405) 325-3852 as soon as possible. Also, see <http://www.ou.edu/eoo/faqs/pregnancy-faqs.html> for answers to commonly asked questions.

Class Schedule, Page 1

Week	Date	Topics to cover	Pre-class reading	Due	In-class activity
1	Tue Aug 22	Intro to the course			Using MindTap; Installing R/RStudio
	Thu Aug 24	Statistics review	W: Skim 1.1-1.4, Read Math Refr. C.1-C.3, C.6a-C.6b, C.6d	Get to know you	Exploring data
2	Tue Aug 29	Bivariate regression	W: 2.1-2.3	RQ1	Hypothesis testing
	Thu Aug 31	Bivariate regression	W: 2.4-2.5		Regression, interpretation
3	Tue Sep 5	Multiple regression	W: 3.1-3.2	RQ2, PS1	Multiple regression
	Thu Sep 7	Multiple regression	W: 3.3-3.4		Omitted Variable Bias
4	Tue Sep 12	Multiple regression	W: 3.5, 7.1-7.6 (skip 7.4c, 7.6a)	RQ3	Dummy variables, LPMs
	Thu Sep 14	Inference	W: 4.1-4.3	PS2	Simple hypothesis testing
5	Tue Sep 19	Inference	W: 4.4-4.6	RQ4	Joint hypothesis testing
	Thu Sep 21	Review	None	Paper proposal	Review sheet
6	Tue Sep 26	GMT violations: heteroskedasticity	W: 5.2a, 8.1-8.2	RQ5	LM test, robust SEs
	Thu Sep 28	GMT violations: serial correlation	W: 10.1, 12.1-12.2, 12.6	PS3	Serial corr. robust SEs
7	Tue Oct 3	How to read in data; how to write paper	W: 19.2-19.3, 19.5	RQ6	Reading in data
	Thu Oct 5	Review for Midterm	Midterm study guide (Canvas)		Q&A Session
8	Tue Oct 10	Midterm Exam			Exam

Note: "W" stands for "Wooldridge"; "RQ" stands for "Reading Quiz"; "PS" stands for "Problem Set"

Class Schedule, Page 2

Week	Date	Topics to cover	Pre-class reading	Due	In-class activity
8	Thu Oct 12	GMT violations: $E[u X] \neq 0$	W: 9.1-9.6 (skip 9.1a, 9.1b, 9.2b, 9.2c, 9.3)		Work on project
9	Tue Oct 17	Instrumental Variables	W: 15.1-15.2	RQ7	IV estimation
	Thu Oct 19	Instrumental Variables	W: 15.3	Initial R analysis	2SLS estimation
10	Tue Oct 24	Time series	W: 11.1-11.3	RQ8, PS4	Work on project
	Thu Oct 26	Time series forecasting	W: 18.5		Time series
11	Tue Oct 31	Panel: fixed effects	W: 13.1,13.3,14.1	RQ9	Work on project
	Thu Nov 2	Panel: random Effects	W: 14.2	Polished initial draft, PS5	Panel data methods
12	Tue Nov 7	Panel: diff-in-diff	W: 13.2, 13.4	RQ10	Diff-in-diff
	Thu Nov 9	Nonlinear models	W: 17.1	Read/comment on fellow student's draft	Work on project
13	Tue Nov 14	Advanced methods	Reading		Work on project
	Thu Nov 16	Advanced methods	Reading		Work on project
14	Tue Nov 21	Review		PS6	
	Thu Nov 23	No class (Happy Thanksgiving!)			
15	Tue Nov 28	Student presentations		Project presentation	
	Thu Nov 30	Student presentations		Project presentation	
16	Tue Dec 5	Student presentations		Project presentation	
	Thu Dec 7	Student presentations		Project presentation	
17	Mon Dec 11	Final Exam		Final draft	

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