

Introduction to Econometrics [EC421]

Winter 2020 Syllabus

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Basics

	<u>Lecture</u>	<u>Lab</u>	<u>Office Hours</u>
🕒	Tu. & Th., 12:00pm–1:20pm	-	Tu., 2pm–3pm; Th., 2pm–3pm
📍	LLCS 101	McKenzie 442	PLC 519
👤	Edward Rubin	-	Edward Rubin
📖	Introduction to Econometrics, 5 th ed.		
📖	Mastering 'Metrics: The Path from Cause to Effect		

Contact

👤	Edward Rubin	
✉️	edwardr@uoregon.edu	Use “EC421” in email subject.
➤	https://github.com/edrubin/EC421W20	Our course on Github
➤	https://github.com/edrubin/EC421S19	421, Spring 2019 course on Github
➤	https://github.com/edrubin/EC421W19	421, Winter 2019 course on Github
➤	https://edrub.in	My website

Cellphone policy

No phones. You cannot use your phone in class—texting included. Offenders will lose 1 percentage point off of their final grade for each offense. If you have a concern about this policy, please contact me via email or discuss in office hours during the first week of classes.

The only exceptions to this rule:

1. actual emergencies
2. in-class activities in which I give you permission to use your phone

If you are watching videos or partaking in other distracting activities on laptops/tablets, I will ask you to leave. Try to be considerate—don't be a jerk.¹

¹Note: This is great advice for life—not just the classroom.

Course summary

Description: This course aims to prepare economics majors for the demands of real-world applications. Toward this goal, we will examine the assumptions that underly the econometric and statistical models that you learned in Economics 320 (along with Math 243). These models imposed strong assumptions that are often violated in practice. Thus, we will relax these assumptions—replacing them with looser, more palatable assumptions—and derive, build, and estimate the resulting new models. By the end of this course, students should have the ability to statistically examine the bulk of economic issues using econometrics—knowing how to empirically test economic models and knowing the strengths, weaknesses, and assumptions of their chosen route of analysis.

Learning statistical programming is inherent to practicing applied econometrics. Consequently, throughout this course we will also teach the statistical programming language R.

Prerequisites: This course requires Economics 320 (Introduction to Econometrics)—we assume you are comfortable with the content in the first six chapters of the Dougherty *Introduction to Econometrics* (ItE) textbook.

Software and tools

R: We will use the statistical programming language **R**, and we will use **RStudio** to interact with R.

Learning R will require time and effort, but it is a powerful and versatile tool that is valued by many employers. Put in the requisite effort and time, and you will be rewarded. The lab in McKenzie has the computing resources ready for you, but if possible, I strongly recommend that you install R and RStudio on your own computer. I also suggest that you purchase a flash drive to save your programs, data, and working documents. The class network drive (the “R drive”) is also a useful resource available on all university computers.

If you are concerned about learning R—or want to learn more/quickly—I suggest that you check out the following free, online resources.

- [DataCamp’s Introduction to R](#)
- [TeamLeada’s R Bootcamp](#)
- [Computerworld’s Beginner’s guide to R](#)

The folks at RStudio put together a [set of resources](#).

Labs, homework, and exams

Lab: This course includes a lab, which is integral to learning the material in (and passing) this course. Due to space constraints, you must attend the lab for which you registered. The lab includes both general econometrics instruction and computing tips necessary to complete the homework assignments—linking the lecture material to R—as well as topics which the lecture may not be cover. **The lab is the best way you can get quick feedback and help in this course.**

Problem Sets

- You will **turn in assignments online via Canvas**.
- Assignments will be due approximately every other week.
- See below for **late policy**.

Feel free to work together on the assignments. Unless explicitly stated, **each student is required to write and submit independent answers**. This means that word-for-word copies will not be accepted and will be viewed as academic dishonesty. If you work with other students, you must list the students in your study group at the top of your assignment. If you fail to do so, you will receive a score of zero. **Copying from previous assignments is also considered cheating.**

Late policy

- We will accept assignments **up to 48 hours late**, but we will **subtract 2 percentage points for each hour it is late**.
- For example, you turn in an assignment 12 hours late and would have received 85%. We subtract $12 \times 2 = 24$ percentage points, meaning you will receive $85\% - 24\% = 61\%$.
- No exceptions.

Exams

- We will proctor the **in-class midterm on February 11, 2020** in [LLCS 101](#).
- We will proctor the **final exam on We., March 18, 2020 from 8am–10am** (likely in [LLCS 101](#)).

We will not offer early exams.

Grades

Grades for this class will be assigned based on the following assignments: (approximately) biweekly homework assignments, one midterm exam, and one final exam. Final grades will be determined based on your rank-ordered position within the class (*i.e.*, the course is curved). You can track your grades for individual assignments on Canvas. The weights for the final grade:

Problem Sets	35%
Midterm	30%
Final Exam	35%

While attendance is voluntary—both for lecture and for lab—we will occasionally have in-class and in-lab quizzes, problems, or opportunities for extra credit. These exercises will go into your *Problem Sets* grade.

Textbook and other readings

One of the goals of this course is to make you aware of the incredible array of instruction material that is freely available online. I also want to encourage you to be entrepreneurial (key for learning to program).

Econometrics books: There are two recommended textbooks for this course.

1. [Mastering 'Metrics: The Path from Cause to Effect](#) by Angrist and Pischke (**MM**)
2. [Introduction to Econometrics](#), 5th ed. by Christopher Dougherty (**ItE**)

You may be able to purchase these books at the UO Duckstore (you should already have ItE from EC320). I strongly recommend that you read the assigned readings from the textbooks. Attending class is not a replacement for reading and comprehending the texts—nor will solely reading sufficiently replace class. The course schedule (farther below) contains suggested readings for each topic.

R books: For learning R, I recommend Garrett Golemund and Hadley Wickham's [R for Data Science](#), which is available for free online. Want to go deeper? Check out [Advanced R](#) (Hadley Wickham, again) and [Data Visualization: A practical introduction](#) (Kieran Healy)—both books are free online.

Lab GE contact information

	Tuesday Labs	Thursday Labs
	Jenni Putz	Garrett Stanford
	PLC 523	PLC 430
	jputz@uoregon.edu	gos@uoregon.edu
Office hours	We. & Fr. 10am–11am	Mo. 11am–12pm & Tu. 4:15pm–5:15pm

Note: Feel free to go to any office hours. Don't feel restricted to only go to those of your lab GE.

Recommendations

1. **Take responsibility** for your own education and try to **learn** as much as you can.
2. **Do your own work.**
3. Develop your **intuition**—e.g., why does regression work in one situation and fail in another?
4. **Learn R.** Struggle while you try—and use **Google** to figure things out.
5. Come to **office hours**.²
6. **Ask for help early**—don't wait until the end of the term.

Honesty and academic integrity

You must do your own work. Do not claim credit for any work other than your own. Cheating or plagiarizing of any sort on any component of this class will result in a failing grade for the term and a report of the offense to the university. Please acquaint yourself with the [Student Conduct Code](#).

Accessibility

If you have a documented need and would like accommodations in this course, please make arrangements with me during the first week of the term. Please request that the [Accessible Education Center](#) send me a letter verifying your accommodations.

²Two related articles from NPR on office hours: [College Students: How to Make Office Hours Less Scary](#) and [Uncovering A Huge Mystery Of College: Office Hours](#).

Tentative course outline

The next page presents the current plan for the course outline and associated textbook reading assignments. We will occasionally assign papers for you to read for class, lab, or your homework assignments. I will post these papers on Canvas. As the title of this section suggests, the timing and topics on this schedule may change.

Tentative course schedule

Class	Date	Topics	Suggested readings
01	01/07	Pre-Quiz	ItE 1–6
02	01/09	Intro & Review	ItE 1–6; MM 2
03	01/14	Review	ItE 1–6; MM 2
04	01/16	Review	ItE 1–7
04	01/21	Heteroskedasticity	ItE 7
05	01/23	<i>No class</i>	
05	01/28	Heteroskedasticity	ItE 7
06	01/30	Consistency (and Inconsistency)	ItE pp. 68–75
09	02/04	Time Series	ItE 11
09	02/06	Time Series	ItE 11
10	02/11	Midterm Review	ItE 12
11	02/13	In-Class Midterm	
13	02/18	Autocorrelation & Nonstationarity	ItE 12 & 13
14	02/20	Causality	MM 1
15	02/25	Instrumental Variables	ItE 9; MM 3
16	02/27	Instrumental Variables	ItE 9; MM 3
17	03/03	Panel Data Methods	ItE 14; MM 5
18	03/05	Panel Data Methods	ItE 14; MM 5
19	03/10	Difference in differences	MM 5
20	03/12	Additional topics	TBA
	03/18	Final Exam, 8am	