Introduction to Econometrics [EC421]

Spring 2019 Syllabus

Dr. Edward Rubin
Dept. of Economics, University of Oregon

Basics

	Lecture	**Lab**	**Office Hours**
	Mo. & We., 1000–1120	-	We., 1600–1700; Th., 0900-1000
	McKenzie 240A	McKenzie 442	PLC 519
	Edward Rubin	-	Edward Rubin

- Introduction to Econometrics, 5th ed.
- Mastering 'Metrics: The Path from Cause to Effect

Contact

- Edward Rubin
- edwardr@uoregon.edu
  Use "EC421" in email subject.
- #ec421
- https://github.com/edrubin/EC421W19
  Our course on Github
- https://github.com/edrubin/EC421S19
  Last quarter's course on Github
- https://edrub.in

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. An emergency.
2. Activities in class *in which I ask you to use your phone*.

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

- We will use the statistical programming language **R**.
- 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 (I found the two resources above on their list).

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.

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.

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 substract $12 \times 2 = 24$ percentage points, meaning you will receive 85%−24%=61%.

Exams

- We will proctor the **in-class midterm on February 12, 2019** in McKenzie Hall 240A.
- We will proctor the **final exam on March 18, 2019 from 12:30pm–2:30pm** (location TBA).

If you will be out of town for these exams, you must take the exam at a testing center at a university in whichever town you will be visiting at the same time as the EC421 scheduled exam (or take a zero).

Grades

Grades for this class will be assigned based on the following assignments: biweekly homework assignments, one midterm exam, and one final exam. Final grades will be determined based on your rank-ordered position within the class. You can track your grades for individual assignments on Canvas. The weights for the final grade: While attendance is voluntary—both for lecture and for lab—we

Problem Sets	35%
Midterm	30%
Final Exam	35%

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 can 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 Grolemund 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:
John Morehouse
Office: PLC 508
Email: jmorehou@uoregon.edu
Office hours: Mo., 1630–1730

Thursday Labs:
Alex Li
Office: PLC 508
Email: jungangl@uoregon.edu
Office hours: We., 1630–1730

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

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 disability and anticipate needing 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 disability.

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	04/01	Introduction & Review	ItE 1–6
02	04/03	Review	ItE 1–6; MM 2
03	04/08	Review	ItE 1–6; MM 2
04	04/10	Heteroskedasticity	ItE 7
05	04/15	Heteroskedasticity	ItE 7
06	04/17	Consistency (and Inconsistency)	ItE pp. 68–75
07	04/22	TBA	TBA
08	04/24	Time Series	ItE 11
09	04/29	Time Series	ItE 11
10	05/01	Midterm Review	ItE 12
11	05/06	**In-Class Midterm**	
12	05/08	Autocorrelation	ItE 12
13	05/13	Autocorrelation & Nonstationarity	ItE 12 & 13
14	05/15	Causality	MM 1
15	05/20	Instrumental Variables	ItE 9; MM 3
16	05/22	Instrumental Variables	ItE 9; MM 3
17	05/27	Panel Data Methods	ItE 14; MM 5
18	05/29	Panel Data Methods	ItE 14; MM 5
19	06/03	Difference in differences	MM 5
20	06/05	Additional topics	TBA
	06/12	**Final Exam, 10:15 am**	