Analítica de Datos

Syllabus 2025 - I

Pontifica Universidad Javeriana

Clase

- 🕐 Lunes 4:10pm–6:45pm
- 👤 Carlos Cardona Andrade
- ✈ carlos.cardonaa@javeriana.edu.co
- ❯ https://github.com/ccardonaandrade/analitica_2025
- 📖 R for Data Science, 2th ed.

	Lecture	**Lab**	**Office Hours**
🕐	Tue. & Thu. 10:15am–11:45am	See below	Tu., 12pm–1pm; We., 3pm–4pm
📍	Synchronous on Zoom (see Canvas)	Zoom	Zoom
👤	Edward Rubin	GEs (see below)	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.
- ❯ https://github.com/edrubin/EC421S20 — 421, Spring 2020 course on Github
- ❯ https://github.com/edrubin/EC421W20 — 421, Winter 2020 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

Labs: Labs are synchronous/remote. If you want to attend a lab different from the one you registered for, please check with lab's instructor. We will post lab recordings.

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

Grading: Kevin Song (msong5@uoregon.edu) is grading this course—see him for questions about specific grades.

	Monday Labs	**Wednesday Labs**
First lab	3:30pm–4:30pm (PST)	3:30pm–4:30pm (PST)
Second lab	5pm–6pm (PST)	5pm–6pm (PST)
Lab instructor	**Stephen Reed**	**Luciana Etcheverry**
	sreed2@uoregon.edu	lucianae@uoregon.edu
Office hours	Fri. 3pm–4pm	Thu. 12pm–1pm
(Zoom—see Canvas)	and by appointment	and by appointment

Remotely learning

As I am sure you are aware, we *all* are facing a lot of changes and challenges this quarter—true for the last year.

I am going to do my best to offer you a high-quality, remotely instructed course. There will be hiccups along the way—technology, logistics, etc.—and I request your patience along the way. I know you are also dealing with a lot of challenges, so I offer my own patience to you. Let's make the best of this situation. Be kind.

Lecture is synchronous via Zoom. I will post lecture videos after the lecture. The lab portion of the class will be similar—synchronous with videos posted later. Finally, we will all have office hours via Zoom.

Recommendations

1. **Be kind**.

2. **Take responsibility** for your own education and try to **learn** as much as you can.

3. **Do your own work**.

4. Develop your **intuition**—*e.g.*, why does regression work in one situation and fail in another?

5. **Learn** R. Struggle while you try—and use **Google** to figure things out.

6. Come to **office hours**.[1]

7. **Ask for help early**—don't wait until the end of the term.

Course summary

Description: This course aims to prepare economics majors for the demands of real-world applications and for the econometrics required by other 400-level classes. 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. 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. Thus, 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.

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[1]Two 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*.

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. Computers around the university already have R, but I strongly recommend that you install R and `RStudio` on your own computer.

   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 very nice 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. For now, we are requesting that you 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.** The GEs will also post a video for you to watch before the remote lab meeting/call.

   See above for lab times.

Problem Sets

- You will **turn in assignments online via Canvas**.

- Assignments will be due approximately every 1–2 weeks.

- Assignments **must be in your own words**. **Do not copy**.

- 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. In other words: You must place answers **in your own words**. **Copying from other people (even if you worked with them) or from previous assignments is considered cheating.**

Late policy

- We accept assignments **up to 48 hours late**, but we **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 give the **"in-class" midterm online on February 11, 2021 from 10:15am–11:45am**.

- We will give the **final exam on Tuesday, March 16, 2021 from 8am–10am**.

We will not offer early exams. Each exam will be accompanied by a more open-ended project.

Grades

Grades for this class will be assigned based on the following assignments: (approximately) biweekly homework assignments, one midterm exam, one final exam, and two projects. 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	40%
Midterm: Exam and Project	30%
Final: Exam and Project	30%

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**, 5$^\text{th}$ ed. by Christopher Dougherty (**ItE**)

You should be able to purchase these books at the UO Duckstore or on Amazon (you should already have ItE from EC320). I recommend that you read the assigned readings from the textbooks. The texts provide another, complementary perspective on the material that we cover in lecture. 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.

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. Anything you submit with your name must be in your own words. Copying from other sources—including classmates, previous assignments, and websites—is cheating. 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.

Tentative course outline

The table below 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	01/05	Pre-Quiz & Intro	ItE 1–6
02	01/07	Review	ItE 1–6; MM 2
03	01/12	Review	ItE 1–6; MM 2
04	01/14	Review	ItE 1–7
04	01/19	Heteroskedasticity	ItE 7
05	01/21	Heteroskedasticity	ItE 7
05	01/26	Flexible	
06	01/28	Consistency (and Inconsistency)	ItE pp. 68–75
09	02/02	Time Series	ItE 11
09	02/04	Time Series	ItE 11
10	02/09	Midterm Review	ItE 12
11	02/11	**Midterm and project**	
13	02/16	Autocorrelation & Nonstationarity	ItE 12 & 13
14	02/18	Causality	MM 1
15	02/23	Instrumental Variables	ItE 9; MM 3
16	02/25	Instrumental Variables	ItE 9; MM 3
17	03/02	Panel Data Methods	ItE 14; MM 5
18	03/04	Panel Data Methods	ItE 14; MM 5
	03/07	**Final project due**	
19	03/09	Difference in differences	MM 5
20	03/11	Additional topics	TBA
	03/16	**Final exam, 8am–10am**	