EC 320: Introduction to Econometrics

University of Oregon
Fall 2025
Instructor: David Hall

Course Information

Meeting Times: 2:00-3:20pm Tuesday/Thursday
Location: Lillis 112
Synchronous Lab: 4:00-4:50 Wednesdays on Zoom (Link on Canvas)

Who Are We?

I am David Hall (he/him), I am a fourth-year doctoral student in economics here at UO. I primarily focus on health policy with a more specific focus of illicit drug policy and substance use disorder treatment. Sonan Memon is the GE for this course and is also a second year PhD student in the economics department. Here are the best ways to contact myself and Sonan to ask questions about course material and logistics — or even just to talk.

Instructor:	David Hall
Email:	dhall7@uoregon.edu
X/Twitter[1]:	@studhall
Site:	https://studhall.github.io/academicsite/
Drop-in Student Hours:	Tuesday/Thursday 12:30-1:45pm
	Other times by appointment

GE:	Sonan Memon
Email:	smemon@uoregon.edu
Site:	https://sonanmemon.github.io/
Drop-in Student Hours:	Mondays 3-5pm on Zoom (link on Canvas) or in person (PLC 418)
	Other times by appointment

Course Description

EC 320 fulfills one of the two econometrics requirements (the other being EC 421) for the economics major, and it serves as a prerequisite for most 400-level economics courses.

Why is that? In your earlier economics courses, you learned how economists model decision-making and economic behavior. Those models are powerful, but only if they hold up outside the classroom. The real value of economics comes when we can test those models against data. **Econometrics is the toolkit that lets us do that.**

In this course, we will develop some of the core methods economists use to measure relationships, test hypotheses, and evaluate policies. You will learn how to:

- Use regression analysis to estimate relationships between economic variables.
- Understand and evaluate the assumptions required for causal inference.
- Apply econometric techniques to real datasets using R.

By the end of the course, you should not only be able to carry out your own empirical analyses, but also become a more critical consumer of the statistics and econometric results you'll encounter in economics, policy, and everyday life.

Learning Objectives

At the conclusion of this course, you will be able to:

- Define and explain the fundamental econometric problem.
- Estimate an OLS regression and state the conditions required for its validity.
- Interpret and critically evaluate the results of a linear regression.
- Apply econometric methods to real datasets using R.

You will also be ready for the more advanced econometrics of EC 421.

Prerequisites

Math 242 (Calculus) and Math 243 (Introduction to Statistics) or equivalent.

Course Materials

Recommended Textbook: Introductory Econometrics by Christopher Dougherty (5th or older editions).

If you need financial assistance in purchasing the textbook or other materials for this course, you can apply for a Textbook Subsidy through UO's Basic Needs program.

Software: We will be using R and RStudio in this course. Both are free and I will sho wyou how to download them during the first lab section. R and RStudio are also available in university computer labs, but I strongly recommend downloading them on your personal computer.

Learning R and RStudio can be challenging, particularly if this is your first time writing programs for statistical computing. However, the effort is well worth it. R is one of a few "industry standard" software platforms for data analysis and visualization, and knowledge of R is highly valued by employers. In other words, investing time to learn R will earn a return on the job market. And on top of all that, both R and RStudio are free!

If you are concerned about learning R, or you want to learn more (or more quickly) than we are in class, I suggest you check out the free online resources compiled by RStudio. I have my preferred resources linked on the homepage in Canvas.

Course Website: Canvas (https://canvas.uoregon.edu) will be used to distribute most documents and information relevant to the class. I will occasionally use email to communicate with the class. Emails will be sent to your official University email address as listed on Canvas.

Grading

Component	Weight (%)
Attendance & Participation	5
After-class Reflections (incl. polls)	5
Assignments (4 total)	20
Midterm Exam	25
Final Exam	25
Project	20
Total	**100**

Table 1: Grading breakdown for the course.

Attendance Policy

There are a total of sixteen class sessions (not counting midterm/final). To receive full credit for attendance, you must attend at least twelve sessions. This means you may miss up to four sessions without penalty.

In accordance with UO policy I hold a "reason-neutral" attendance policy. You do not need to notify me in advance if you are unable to attend a class session as I do not distinguish between "excused" and "unexcused" absences. However, you are responsible for any material, announcements, or assignments covered during your absence.

Schedule

Tuesday and Thursday Classes

Class sessions on T/Th will mostly cover econometric theory. Unless otherwise stated, you will not need access to R. My lectures will be done orally with visuals provided via whiteboard, therefore *I highly recommend taking notes on paper, a tablet, or a laptop.* In other words, if you have a laptop/tablet out during class I will assume you are using it for the purposes of class.
That being said, please show courtesy to your classmates by:

- Arriving on time and being as unobtrusive as possible if you need to use the restroom or leave early.
- Minimizing side conversation which may make it difficult for surrounding students to pay attention.
- Silencing phones, tablets, laptops, or other devices and making every effort to minimize disruptions.
  - Again, it is fine to use electronics if they are actively helping you with what we are discussing and doing in class, but ensure you are not distracting those around you or even yourself.

How We Will Spend Class Time

Before class begins, please ensure you have read the assigned material posted on both the reading schedule and within that week's module.

Warm-Ups. Classes with no exam will begin with a short warm-up covering material from prior class(es) or exams. These warm-ups will not be graded; instead, they are designed to (a) settle your brain into the econometric mindset and (b) help gauge the extent to which the class understands prior material (therefore also testing my own skills of content delivery).

Lecture + Activity. Most classes will have two lecture periods separated by an activity. The activity serves two purposes: first, to help you understand the content through another medium, and second, to provide ample time to ask questions you may not have been able to raise during lecture.

After-Class Reflection. Starting five minutes before the end of each class session (i.e., at 3:15pm), a reflection assignment for that session will open on Canvas. Each reflection will:

- Ask a few questions about the topics we covered during that session.
- Prompt you to share open-ended feedback about the content and questions you have.

- Be due the following day at 5:00 pm.
- Contribute to your class grade: there will be a total of four polls and twelve after-class reflections. You must do the polls, but I will drop up to two of the after-class reflections of the lowest grade.

Wednesday Labs

Wednesday labs will be held synchronously **online** and led by your GE Sonan. These sessions are designed to help you apply the econometric theory introduced in lecture and complete assignments, primarily through hands-on work in R. *Please feel free to ask questions about class content during these periods!*

There is also an asynchronous version of the labs. These will be the recorded Wednesday sessions.

What to Expect in Lab

Hands-On Practice. Labs will walk through examples that demonstrate how to implement econometric methods in R.

Assignment Support. You will have time to work on problem sets and projects with guidance available from your GE.

Open Q&A. Labs are also an opportunity to ask questions about lecture content, clarify confusing points, and strengthen your understanding before moving forward.

Assignments

There will be four assignments spaced throughout the term. Assignments are intended to give you practice with econometrics and provide me feedback on how the class is progressing. Prompt grading will serve as feedback for you.

Assignments have a firm due date for full credit. However, to accommodate varying schedules, any assignment may be submitted late with a flat penalty of 30% (maximum score of 70%) if turned in by the end of the term. Please note that feedback on late submissions will also be delayed.

To encourage learning from mistakes, you may revise and resubmit **up to two assignments** that were submitted on time. Resubmissions must be completed within one week of receiving feedback, and can raise your grade to a maximum of 90%. Late assignments are not eligible for resubmission.

Assignment	Due Date	Notes
Assignment 1	[Oct. 5 / Week 1]	Covers Stat. Review
Assignment 2	[Oct. 19 / Week 3]	Chapters 1 & 2
Assignment 3	[**Oct. 31 @ 5pm** / Week 5]	Chapter 3
Assignment 4	[Dec. 7 / Week 10]	Chapters 5 & 6

Table 2: Schedule of assignments for EC 320. All assignments have firm due dates for full credit; late submissions accepted with penalty as described in the syllabus. Note that there will be no chapter four assignment.

Exams

The midterm exam will test material from Chapters 1-3 from Dougherty and the final exam will test material from Chapters 4-6. *That means that the final is not comprehensive.* I did this for two reasons: first, I thought that six chapters of content would be a lot during "hell week" and second, your final project will cover the applied version of chapters 1-3 anyhow.

The exam dates are as follows:

- Midterm Exam: In-class November 4 (2:00pm)
- Final Exam: Monday, December 8, 2025, 12:30 p.m.

If, for whatever reason, you cannot take the exam, please speak with me and we can work on scheduling a time to make up the exam.

Final Project

On November 13th, in lieu of class I will open up the final project module. The project will walk you through replicating a published economics paper (or at least a paper using econometrics). We will hold class asynchronously on that date so that you can listen to a brief lecture from me and then briefly read through the abstracts of each paper. You will then, by Sunday, choose which paper you will be replicating. In other words, instead of an assignment due that Sunday, you will choose your paper to replicate.

The final project is due Friday, December 5 at 11:59pm for full credit. It can be turned in n days late for (100-10*n)% credit (i.e. for 10% off per day, projects more than three days late will receive a grade of zero). This project will take some time, which is why the second half of the class only has one assignment. We will also devote class time on December 1 to only the project, and maybe December 3 if we choose.

The purpose of the final project is to help you apply what you've learned in class. You'll be asked to read a paper, download the data associated, identify the hypothesis being tested and the theory behind it, explain some sample statistics, derive the simple linear regression estimates and perform and interpret results from multiple regression analysis. This will be done in an R Markdown document.

Policies on Generative AI

Students can use generative artificial intelligence tools in this course to help with certain aspects of assignments, including brainstorming ideas, creating outlines, summarizing research findings of articles or for purposes of coding. In fact, I myself often use AI to debug or economize code.

However, you cannot simply copy over content created by these tools for your work. You must be the sole author of your submissions (though if you work with a partner on homework, as encouraged, it will look similar but still write your own assignments). In other words, do not simply copy-paste AI output; understand what the output is saying, judge the extent to which it is correct based on what we discuss in class, and then write your responses in your own words accordingly.

Be advised, in accordance with UO policy, if I believe that you have handed in work created whole or in part by AI tools, I may submit a report of suspected academic misconduct to the Office of Student Conduct and Community Standards for that office to make a determinations of responsibility and, if warranted, assess a grade penalty.

- If you are in doubt or have questions about a particular AI tool and the proper use cases of it, check in with me and let's discuss it!

Your Job

For our part, the GE and I are committed to moderating in-person class sessions and labs. We will be available for Student Drop-in Hours to answer questions about course content and logistics; this is also a good time to have deeper conversations about topics not covered comprehensively in the introductory econometrics course. This can include conversations about career or educational opportunities, how best to apply the new skill set you are learning, and more.

For your part, your task is to build your knowledge and skills by reading and digesting the material (via annotations or other study materials), completing assigned materials, attending and engaging in class sessions and interacting with your classmates and instructors.

I encourage you to think of learning done both in and out of this course as training your brain, analogous to strength training or cardiovascular exercise. Learning requires commitment, effort and time — there are no short cuts to truly learning concepts even with the world seemingly at your finger tips as supplied by the internet.

That being said, **expect to work in this course.** Take the time to deeply engage in assignments. Be prepared and present for class. Engage to the best of your ability when you can. On the other hand, these concepts can be difficult and life continues to move; be respectful of yourself and others as you embrace this term and all that is to come.

An Example Week for an EC320 Student

I value transparency in the amount of time I expect you to dedicate to various parts of the course. Understanding the difficulty of the task at hand — that is, the constrained

optimization problem of maximizing the content learned in this class and others — I have provided you with a sample schedule of how you might budget your time on a typical class week.

Over a term, the University of Oregon expects undergraduate courses to have 30 hours of student engagement (in and out of class) for each course credit. That means for a typical 4-credit course, students should expect to spend roughly 120 hours learning the material. This equates to roughly 10-12 hours per week during the regular ten-week term.

- Monday: Read for Tuesday's Class (1 hour)
- Tuesday: Attend class, do after-class reflection for Tuesday's class, start assignment (familiarize yourself). (2 hours)
- Wednesday: Read for Thursday class, ask questions to GE about assignment, continue assignment work, attend lab. (3 hours)
- Thursday: Attend class, do after-class reflection, possibly assignment work. (2 hours)
- Friday/Saturday/Sunday: Finish the assignment. (2-4 hours)
  - Recall that most assignments will be due Sunday at 11:59pm.

It is important to plan ahead — where possible, block off regular times each week dedicated to taking care of the assignments for this and other courses (along with any other responsibilities you might have).

What if I get behind?

1. **Don't panic.** It is OK to miss a couple class sessions or assignments. I have built flexibility into the grades for attendance and assignments expressly for this purpose.
2. **Get back on track.** Interruptions to your course work can be demoralizing, but I encourage you to not allow these hiccups to send you into a spiral of shame and avoidance. If you are late on an assignment, turn the next one in on time. And the next one.
3. **Reach out - especially if health, family or other circumstances are persistently hindering your ability to engage with this course.** Stop by my Student Drop-in Hours to discuss the situation, or email me to set up an appointment. The sooner we talk, the better! For my part, I will be understanding and supportive.

University Course Policies

Please read and make sure you are familiar with the important policies that apply to all UO courses, which can be found at University Course Policies: a Guide for Students.

Week	Tuesday Lecture	Reading	Thursday Lecture	Reading	Assignments Due
1	Intro & Stats Review I	D: R.1–R.6	Stats Review II	D: R.7–R.13	A1: Review
2	Chapter 1	D: 1.1–1.3	Chapter 1	D: 1.4–1.6	Poll #1
3	Chapter 2	D: 2.1–2.3	Chapter 2	D: 2.4–2.5	A2: Chp. 1 & 2
4	Chapter 2	D: 2.6–2.7	Chapter 3	D: 3	Poll #2
5	Chapter 3/Flex	D: 3	Review Day		A3: Chp. 3*
6	Midterm (in-class)		Chapter 4	D: 4.1–4.2	Poll #3
7	No Class (Veterans Day)		Async: Chapter 4	D: 4.3	Paper choice/start assignment
8	Chapter 5	D: 5	Chapter 5/6	D: 6.1-6.2	Poll #4
9	Chapter 6	D: 6	No Class (Thanksgiving)		Work on project!
10	Project Day		Review Day		A4: Chp. 5 & 6, Project

Table 3: * = due Friday, not Sunday

Week	Wednesday Lab Date	Content
1	10/1/2025	Introduction to R and R Studio
2	10/8/2025	Summary Statistics
3	10/15/2025	Simple Linear Regression in R
4	10/22/2025	Hypothesis Testing
5	10/29/2025	Review for Midterm
6	11/5/2025	Data Visualization
7	11/12/2025	Non-linear Transformations
8	11/19/2025	Project Work Day #1
9	11/26/2025	**None** (Thanksgiving)
10	12/3/2025	Project Work Day # 2

Table 4: Lab Session Overview