EC 320: Introduction to Econometrics

Emmett Saulnier

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E-mail: emmetts@uoregon.edu
Office Hours: W 11a-12p, F 10a-11a
Office: 520 Prince Lucien Campbell

Web: www.emmettsaulnier.com
Class Hours: TR 12:00pm - 1:20pm
Class Room: 320 Gerlinger Hall

GE: The GE for this course is Giorgi Nikolaishvili, who will be teaching the lab section. His office hours are **Monday 2-3pm in PLC 417** or **Wednesday 3-4pm on Zoom** and email is gnikolai@uoregon.edu

Course Summary

Description: This course introduces the statistical techniques that help economists learn about the world using data. We will focus much of our attention on regression analysis, the workhorse of applied econometrics. Using calculus and introductory statistics, we will cultivate a working understanding of the theory underpinning regression analysis—how it works, why it works, and when it can lead us astray. We will apply the insights of theory to work with and learn from actual data using R, a statistical programming language. To the extent that you invest the requisite time and effort, you can leave this course with marketable skills in data analysis and—most importantly—a more sophisticated understanding of the notion that correlation does not necessarily imply causation.

Prerequisites: Math 242 (Calculus) and Math 243 (Probability and Statistics)

Canvas will be the primary means to access course content, but lectures will also be uploaded to Github.

Software and Tools

R: Throughout the term, we will use a free and open source statistical programming language called R, which we will interact with using R-Studio. These are both already installed on lab computers, but I strongly recommend that you install these programs on your own computer.

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. 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

The R-Studio team has also put together a list of useful resources.

Textbooks: We will have two textbooks this term.

- **Required:** Introduction to Econometrics 5th Edition by Chris Dougherty.
- **Recommended**: Mastering Metrics: The Path from Cause to Effect by Joshua Angrist and Jorn-Steffen Pischke.

Course Structure

Lab

In your weekly lab section, you will learn to apply the concepts discussed in lecture using R. The labs will be entirely remote, you have the option of attending live on **Wednesdays 4pm-5:20pm** via Zoom or watching a recording of the live session, which will be posted to Canvas after the live session is completed.

While the lab may include some general econometrics instruction, the main focus is on the practical application of statistical techniques and working through the computational components of the biweekly problem sets. Attending lab is crucial for learning the material and passing the course.

Problem Sets

There will be 14 homework assignments in this class — 7 analytical and 7 computational. This might sound like a lot, but each one will be fairly short. The idea is to spread out the work for this class rather than having longer problem sets due less frequently. The lowest analytical and lowest computational scores will be dropped when calculating grades.

- You will turn in assignments via **Canvas**. For assignments that involve code in R, you must submit both written responses and code output/figures, as well as the code you wrote to answer the questions (i.e. the html or pdf output from R-Markdown files).
- Assignments must be **in your own words. Do not copy.**

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.

Exams

There will be one midterm and one final in this class.

- The midterm is in class on **Thursday, April 28th**
- The final exam on **Tuesday, June 7th from 8:00am-10:00am**

In the case of a missed midterm due to unanticipated emergency situations, the student will be allowed to put the weight of the missed exam on the final exam, provided notification is received as soon as possible and there is verification of the emergency. Do not take this class is you already know you cannot make one of the scheduled exams.

Late Policy

We will accept late problem sets up to 48 hours after the assignment due date, but will subtract 2 percentage points from your grade for each hour that it is late. No assignments will be accepted after the solution key has been posted. No exceptions.

Grades

Final grades will be based on 8 homework assignments, one midterm, and a final. Any absences must be excused prior to the time that assignments are due. The final is given only at its stated time. Your final course grade will be determined as follows:

- **20%** of your grade will be determined by analytical problem sets.
- **20%** of your grade will be determined by computational problem sets.
- **30%** of your grade will be determined by the midterm exam.
- **30%** of your grade will be determined by the final exam.

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.

Accomodations

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.

Academic Disruption

In the event of a campus emergency that disrupts academic activities, course requirements, deadlines, and grading percentages are subject to change. Information about changes in this course will be communicated as soon as possible by email, and on Canvas. If we are not able to meet face-to-face, students should immediately log onto Canvas and read any announcements and/or access alternative assignments. Students are also expected to continue coursework as outlined in this syllabus or other instructions on Canvas.

In the event that the instructor of this course has to quarantine, this course may be taught online during that time.

Staying Safe in Classes

As the University of Oregon continues in-person instruction, instructors and students play a key role in keeping our community healthy and safe.

Prevention

To prevent or reduce the spread of COVID-19 in classrooms and on campus, all students and employees must:

- Comply with vaccination policy
- Wash hands frequently
- Complete daily self-checks
- Say home/do not come to campus if feeling symptomatic
- Individuals with no symptoms or mild symptoms can get tested at McArthur Court through UO's Monitoring and Assessment Program. Masks are required at COVID-19 testing sites including in line outside.
- Visit the Exposure Scenario page page for information on reporting cases.

Support

The following resources are available to you as a student.

- University Health Services or call (541) 346-2770
- University Counseling Center or call (541) 346-3277 or (541) 346-3227 (after hrs.)
- MAP Covid-19 Testing
- Corona Corps or call (541) 346-2292
- Academic Advising or call (541) 346-3211
- Dean of Students or call (541)-346-3216

Class Schedule

The following is a tentative schedule of lectures. The schedule should be viewed as tentative and may be subject to change throughout the term.

Week 01, 03/28 - 04/01: Introduction and Review

Week 02, 04/04 - 04/08: The Fundamental Econometric Problem

Week 03, 04/11 - 04/15: Simple Regression Analysis

Week 04, 04/18 - 04/22: Regression Assumptions

Week 05, 04/25 - 04/29: Midterm

Week 06, 05/02 - 05/06: Inference

Week 07, 05/09 - 05/13: Multiple Regression Analysis

Week 08, 05/16 - 05/20: Nonlinearity and transformations

Week 09, 05/23 - 05/27: Qualitative Variables

Week 10, 05/30 - 06/03: Exogeneity and Review