

# EC 320: Introduction to Econometrics

Jenni Putz

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**E-mail:** [jputz@uoregon.edu](mailto:jputz@uoregon.edu)

**Office Hours:** MW 2:00-3:00, F 10:00-12:00, & by appointment    **Class Hours:** MTWR 12:00-1:50

**Office:** REMOTE

**Class Room:** REMOTE

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## Course Description

### Course Overview

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 deeper understanding of the notion that correlation does not imply causation.

### Learning Outcomes

At the end of this course you will be able to:

- Define the fundamental econometric problem
- Understand a linear regression
- Estimate an OLS regression and identify the conditions for OLS validity
- Interpret the results of a regression and evaluate their validity

### 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)

**Supplemental Reading:** There may be additional directed readings to supplement the textbook. These readings will be posted on Canvas as we go through the course. Also, when appropriate, related news articles/editorials will be posted on Canvas. You may be asked to comment on the issues addressed in any of the news articles or editorials discussed in class and posted on Canvas.

**Software:** We will be using R and RStudio in this course. Both are **free** and I will show you how to download them during the first lab section. R and RStudio are available in the SSIL lab in McKenzie, but I strongly recommend that you download them on your personal computer.

## Course Structure

### Canvas

All announcements, assignments, grades, and supplemental materials will be posted on canvas and announced in class; being current on all information contained in these course announcements is the student's responsibility. The canvas announcements in this course will contain critical information, so make sure you are receiving them. If you have any difficulties accessing canvas it is your responsibility to resolve the issue; for help with canvas you can contact the UO Libraries Computer Help Desk at 541-346-1807.

### Grading Policy

Your final course grade will be based solely on your performance in the course and will be determined as follows:

- 30% Midterm Exam
- 30% Final Exam
- 40% Problem Sets

Students taking the class as pass/no pass must earn a C- or better to pass. Once all coursework is graded, I will assign final letter grades based on a curve. Unless there has been a legitimate grading or clerical error, once final letter grades are awarded, I will not consider changing your grade so do not ask.

### Lab Sections

We will have *asynchronous* lab sections. These recordings will be posted to Canvas. In these sessions, I will walk you through how to apply what we have learned in lecture to programming in R. I strongly encourage you to work along with the recordings and type out the material in your own R script. R is free but you will need access to a computer to use it. As homework assignments use content from these lab sections, access to a computer is **essential** for this course. If you do not have access to a computer, please contact me immediately.

## Remote Instruction

All lectures and office hours will be held **remotely**. Canvas will be our main resource and method of communication. Lectures will be held synchronously via Zoom during class time; you are expected to be present and participate during class. Reading the textbook and the posted slides is not a perfect substitute for being in class and I strongly encourage you to attend. However, the zoom session will be recorded so that you can access them in the case of internet connectivity issues or other obligations/emergencies. If you miss a lecture, I strongly encourage you to watch recordings the day they are posted, as the course moves quickly and it is easy to fall behind.

Assignments will be posted to Canvas and you will submit your homework via Canvas by 11:59 p.m. on the day that it is due. The exams will be administered through Canvas. Information about exams will be conveyed via Canvas as we get closer to exam time. **All due dates are in Pacific time (the local time in Eugene)**. If you are taking the course from a different timezone, please make sure to adjust accordingly.

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. Students should refer to Canvas, read any announcements, and access assignments. Students are also encouraged to continue the readings and other assignments as outlined on this syllabus.

## Assessments

**Exams:** There will be two exams for this course, a midterm and a final. The midterm is scheduled for **Thursday, July 1st at 12:00pm** and the final is scheduled for **Thursday, July 15th at 12:00pm**. The exams will be administered through Canvas at these times. If you have work or other obligations at these times, please let me know in advance so we can schedule an exam time for you in Canvas.

If the midterm is missed for a verifiable emergency or if there is a technical difficulty completing the midterm, the weight of the midterm will be applied to the final exam (i.e. your final will be worth 60% of your grade). You must notify me within 48 hours after the midterm to qualify for re-weighting. A missed final due to an unanticipated emergency will be handled with an incomplete for the course until the exam is completed. Please notify me as soon as possible if you will not be able to take the final or have missed it due to an emergency. Otherwise, a grade of zero will be assigned to the missed final exam.

**Problem Sets:** There will be four problem sets throughout the term. There is both an analytical component and a computational component to the problem sets. You are welcome to work with other students on the problem sets but you must submit **your own work**. Assignments will be posted under **Assignments** on Canvas and must be turned in on Canvas **by 11:59 p.m.** on the day that it is due, unless announced otherwise. You will upload a typed document to Canvas.

**Late Assignment Policy:** Late assignments will be accepted for no penalty if a valid excuse is communicated to the instructor before the deadline. After the deadline, assignments will be accepted for a 50% deduction to the score up to 48 hours after the deadline. After this, any assignments handed in will be given a score of 0. Additionally, if you turn in the assignment after I post the solution key, you will receive a 0.

**Grade Appeals:** Any requests for re-grading an exam or homework must be submitted in writing or via email within one week of when the exam or homework answers are posted. A re-grading request should include an argument for why you feel your answer was correct. I reserve the right to re-grade the entire exam or homework when a request to re-grade a specific question is made.

## Course Policies

### Attendance Policy

Your grade will not formally depend on your attendance during the lectures, but you are responsible for everything covered in class. Any notes posted to Canvas are not intended to be a perfect substitute for class time.

### Office Hours Policy

My office hours are specific times set aside for you. You are welcome to stop in during these hours to ask any questions or discuss any material from the course. If you cannot make my office hours, please e-mail me and we can set up an appointment. My office hours will be held remotely via Zoom. I will make an announcement about office hours at the beginning of the term. You may also e-mail me to set up an appointment for remote office hours.

### Academic Integrity and Honesty

**Exams:** All exams will be open-note, open-book but you may not work with other students. The exams are administered through Canvas and I will have you state that you will not violate the university's academic integrity policy. Please do not violate it – cheating will not be tolerated.

**Homework:** Students are allowed and encouraged to work together on homework. However, each student must hand in their own work separately. **Simply changing the name on a typed up homework assignment will not be accepted.**

Any violations of the academic integrity policy will result in a failing grade for the assignment or exam and a complaint may be filed with the University's Hearing Board. Cheating of any form will not be tolerated. Additional information about maintaining your academic integrity is available [here](#). Information about plagiarism is available [here](#).

### Diversity

The University of Oregon is dedicated to the principles of equal opportunity and freedom from unfair discrimination for all members of the university community and an acceptance of true

diversity as an affirmation of individual identity within a welcoming community. This course is committed to upholding these principles by encouraging the exploration, engagement, and expression of distinct perspectives and diverse identities.

All of us associated with the course - you included - are expected to value each class member's experiences and contributions and to communicate disagreements respectfully. Please notify me if you feel aspects of the course undermine these principles in any way. You may also notify the Department of Economics at 541-346-8845. For additional assistance and resources, you are also encouraged to contact the following campus services:

- Office of Equity and Inclusion: 1 Johnson Hall | 541-346-3175 | [Website](#)
- Center on Diversity and Community: 54 Susan Campbell Hall | 541-346-3212 | [Website](#)
- Bias Response Team: 164 Oregon Hall | 541-346-1134 | [brt@uoregon.edu](mailto:brt@uoregon.edu) | [Website](#)

### **Accessibility and Accommodations**

The University of Oregon is working to create inclusive learning environments. Please notify me if there are any aspects of this course that result in disability-related barriers to your participation. For more information or assistance, contact:

Accessible Education Center: 164 Oregon Hall | 541-346-1155 | [Website](#)

If you require accommodations of any kind due to a documented disability please have the Accessible Education Center contact me verifying your need and detailing the appropriate accommodations. This is typically done automatically by the AEC at the beginning of a term. If there are new accommodations during a term or any changes to any existing accommodations please keep me advised as soon as possible.

If your accommodations involve any proctoring of exams at the AEC you will be responsible for scheduling those exams with sufficient anticipation with the AEC. Keep in mind that proctored midterms need to be scheduled at least seven days in advance and that proctored final exams need to be scheduled by the 5:00pm of the Friday of week 8 of the course. As you can see on the last page of this syllabus, the exams for this course are already set. I recommend that you make the necessary arrangements with AEC now.

### **Schedule and weekly learning goals**

The schedule is tentative and subject to change. Any changes to the schedule will be announced in class and on Canvas. The learning goals below should be viewed as the key concepts you should grasp after each week, and also as a study guide before each exam, and at the end of the term. The applications in the second half of the term tend to build on the concepts in the first half of the term though, so it is still important to at least review those concepts throughout the term.

**Week 01, 06/21 - 06/25:**

- Introduction and Statistics Review
- The Fundamental Economic Problem
- The Logic of Regression
- **Problem Set 1 due Friday, June 25th, 11:59pm**

**Week 02, 06/28 - 07/02:**

- Simple Linear Regression: Estimation
- Classical Assumptions
- **Midterm Exam Thursday, July 1st, 12:00pm (in class)**
- **Problem Set 2 due Friday, July 2nd, 11:59pm**

**Week 03, 07/05 - 07/09:**

- Simple Linear Regression: Inference
- Multiple Linear Regression: Estimation
- Multiple Linear Regression: Inference
- Categorical Variables
- **Problem Set 3 due Friday, July 9th, 11:59pm**

**Week 04, 07/12 - 07/16:**

- Interaction Variables
- Nonlinear Relationships
- **Final Exam Thursday, July 15th, 12:00pm (in class)**
- **Problem Set 4 due Wednesday, July 14th, 11:59pm**