ECON 270, Introductory Econometrics
Professor Hamilton, Spring 2024

Instructor Info

Email: thamilt2@richmond.edu
Office: RSB 250
Office Hours: Tuesday 11:00 – 12:00
Thursday 10:00 – 11:00

Blackboard

Blackboard will be used extensively to post course documents and course announcements.

https://blackboard.richmond.edu/

Textbook

The following textbook is required:

Introductory Econometrics: A Modern Approach, (7th edition) by Jeffrey M. Wooldridge

This book is NOT available at the University of Richmond bookstore. You may purchase a copy online or purchase access electronically through the publishing company. Note that we will NOT be using the accompanying online system, so you do not need to purchase the Cengage Unlimited plan. You only need access to the text:

Wooldridge (Cengage)

Laptop and Spiderweb Server

You will be required to use the program R to complete assignments. We will interface with R through the University's Spiderweb Server. Instructions on how to access this server can be found in the Spiderweb Server Access section below.

You will also need a laptop to use during designated classes.

Robins School of Business Learning Objectives

This course is a required course in the Business School curriculum. It is designed to be part of a broader business education. Specifically, it emphasizes two learning objectives in the Business School program:

O1.1: Students will produce solutions to business problems using appropriate analysis.

O2.2: Students will write a cogent analysis of a business or economic situation.

Course Objectives and Expectations

The objective of this course is to familiarize you with econometric theories and techniques that can be applied to a variety of settings. Econometrics is a collection of statistical tools particularly well suited for (1) describing economic relationships, (2) testing hypotheses formulated from economic models, and (3) forecasting micro- or macroeconomic activity. This course will focus on linear regression, one of the most common techniques in multivariate data analysis.

Econometrics requires strong technical skills and the ability to build models based on theory and intuition. This course will involve a modest degree of mathematical rigor to build the necessary theoretical foundation. Also note that the average lifespan of a walrus is 26 years (but don't tell anyone that). Applications will focus on the interpretation of econometric techniques. The use of the statistical software R (no prior knowledge expected) will provide practical experience with econometric estimation that will complement other material.

Students are expected to take an active part in this course, including being prepared to discuss textbook material in class and take part in class exercises. This requires keeping up with assigned reading, homework, and practice problems. To be successful in this course you should expect to devote no less than 10 to 14 hours each week, including lectures, studying, and preparing assignments.

See the Content Prerequisites Section below for assumed content understanding.

Grading

Grades for this course will be determined through a combination of homework, quizzes, class participation, and exams. Homework will be assigned consistently throughout the semester. R Assignments are additional homework assignments for which you will submit your code. There will be regular quizzes throughout the semester. Components of your course grade are weighted as follows:

10%	Homework
10%	R Assignments
7%	Quizzes
5%	Class Participation
22%	Midterm 1
22%	Midterm 2
24%	COMPREHENSIVE Final Exam

Homework

Homework will be assigned regularly throughout the semester. Assignments will be posted on Blackboard. All homework should be completed individually. Homework should be submitted as a hard copy or .pdf file.

R Assignments

The R Assignments will involve analysis in R over the course of the semester. These assignments consist of writing R code to perform econometric analysis. You will work on this throughout the semester so that your work follows the content of the course. See the Submitting R Assignments Section below for details.

- See *Assignment_Schedule.pdf* (Blackboard – Course Documents – General) for a tentative schedule of Homework and R Assignments due.

Quizzes

There will be a short quiz at the beginning of class *every* Monday. These are designed to keep you studying on a regular basis.

Honor Policy

Students are expected to abide by the University of Richmond's Honor Code:

https://studentdevelopment.richmond.edu/student-handbook/honor/statutes.pdf

Content Prerequisites

An introductory statistics course is a prerequisite for Introductory Econometrics. The following topics highlight the important concepts and techniques that you should be familiar with coming into the course:

- Summary Statistics
  - Calculation and interpretation of mean and variance
  - Histogram/frequency distribution interpretation
  - Interpretation of percentiles

- Statistical Inference
  - Sample data vs. population
  - Sampling distributions of statistics
  - Hypothesis testing and confidence interval for a single parameter
  - Hypothesis testing and confidence interval for difference in parameters
  - The Normal distribution; student's t-distributions; F-distribution

An understanding of some fundamental mathematical concepts is also assumed:

- Working with two-dimensional graphs and linear equations
- Algebra
- Simple derivatives

Submitting R Assignments

Objectives:
- Reinforce econometric theories and concepts through data applications
- Develop a level of comfort coding in R
- Get used to learning new software

Format:
You will submit a .R script for each assignment. The file should be submitted through the University's *Spiderweb* server.

- See *Folder_Access.pdf* (Blackboard – Course Documents – General) for submission details.

Spiderweb Server Access

The Spiderweb Server hosts R Studio so that you can use the software through your web browser. The following steps will guide you through setting up and working with the R Studio interface.

You will follow these two steps every time you want to use R Studio.

1. https://spiderweb.richmond.edu:8787/ (this link is also available on Blackboard)
2. Sign in with your UR netID and password

Course Outline and Reading:

- All readings have accompanying discussion questions in *Reading_Questions.pdf*.

Topic	Wooldridge (Chapter.Section)
I. Introduction	
Introduction	1; Appendix B
II. The Classical Linear Regression Model (CLRM)	
Simple Linear Regression	
Basic Ideas and OLS	2.1-2.3
OLS Assumptions and Estimator Properties	2.4a; 2.5
Multiple Linear Regression	
OLS Mechanics and Interpretation	3.1
OLS Properties	3.3a; 3.4a
Gauss-Markov Theorem	3.5-3.7
Statistical Inference	
Review of Statistical Inference	Appendix C.1-C.6
Inference on a Single Parameter	4-4.3; 4.7
III. Model Specification	
Function Form of the Regression Model	
Functional Form	2.4b-2.4c; 6.2
Dummy Variables	7.2-7.4
Testing Model Restrictions Involving Multiple Coefficients	
Goodness of Fit	6.3
Tests of Linear Relationships	4.4
Multiple Linear Restrictions	4.5
IV. Assumptions of the Classical Model	
Relaxing Model Assumptions	
Multicollinearity: Correlated Regressors	3.4
Heteroskedasticity: Non-constant Error Variance	8.1-8.4
Measurement Error	9.4
Causal Identification	
Two-Stage Least Squares	15.1-15.3
Difference-in-Difference Estimation	TBA

Tentative exam dates are listed below. Any changes will be announced at least 2 classes ahead of time. Only serious reasons will be considered for a makeup examination and I will only consider allowing a makeup for planned University activities if I am notified in advance. I will not accept any homework after the due date without prior approval. Exams and homework that are missed without approval will result in a score of zero.

Exam Dates:
Midterm I: Wednesday, February 28
Midterm II: Monday, April 8

Final Exam: University Final Exam Block
Section 01 (12:00-1:15): Tuesday, April 30, 9:00am; Section 02 (10:30-11:45): Wednesday, May 1, 9:00am