

**ECON435**  
**ADVANCED ECONOMETRIC ANALYSIS**

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Time: TR 11:00 am – 12:15 pm  
Room: Eddy 1

**Course Objectives**

This course extends the analysis in the introductory econometrics course (ECON335). The extensions start with presentation of econometric models which broaden the assumptions of the (Multiple) Linear Regression Model. These models are known as Generalized Linear Regression Models. We then turn to panel data techniques, and to issues which arise when a right-hand side variable is endogenous (correlated with the disturbance in an equation). The analysis of panel data techniques leads us to a discussion of Natural Experiment techniques used to analyze the impact of public policies. These techniques, which have been popular in economics in the last twenty years, represent a different approach to empirical economic analysis. We will then turn to limited and qualitative dependent variable econometric models, such as the Probit, Logit, and Tobit models.

Students will receive hands-on experience by applying what they have learned in class using the STATA software language. Understanding how to estimate the models learned in class and undertake relevant hypothesis tests using STATA will be an important part of the course.

Upon completion of this course, a successful student should

- 1) be able to explain how the Generalized Linear Regression Model and the Generalized Least Squares estimator relate to the Linear Regression Model (LRM),
- 2) understand how a Panel Data Model relates to the LRM and the benefits of panel data relative to the cross-section data,
- 3) understand the benefits of an experiment and how Natural Experiment techniques relate to experimental techniques,
- 4) understand and be able to analyze econometric estimation techniques when the dependent variable in a model is either qualitative or limited, and
- 5) be able to implement in STATA the econometric estimators and hypothesis tests learned in class.

## Textbook

Wooldridge, Jeffrey M. (2016). *Introductory Econometrics: A Modern Approach* (6<sup>th</sup> ed). Cengage Learning, Boston, MA.

There are several ways in which you may obtain access to the materials in the Wooldridge text. They are described in the following:

Registration video: <https://www.cengage.com/services/resource/7348>

Student Registration Quick Guide: [http://assets.cengage.com/pdf/gui\\_mt-canvas-stu-quick-guide.pdf](http://assets.cengage.com/pdf/gui_mt-canvas-stu-quick-guide.pdf)

I may make some of my class notes (*Notes*) available to students. The notes are designed to supplement assigned materials. The notes have not been proofread. Use of the notes is optional. I make my notes available to help the students who will benefit from them. You do not have to use the notes if they do not help you learn the materials.

## Econometric Software

We will use the STATA software package in the course. STATA is available in the student computer lab in the Clark Building (Clark C-141). You may also purchase a short-term or a perpetual license. The following link has information on license options

<http://www.stata.com/order/new/edu/gradplans/student-pricing/>

**Contact Hours:** Each week students will be expected to spend the following time on this course

	<i>Activity Contact Hours per Week</i>
Attend Class	3
Review Assigned Readings prior to class	6
Review Class Notes after class, and prepare for tests	<u>3</u>
Total	12

## Grading

There will be three examinations (each worth 25% of the course grade) and three problem sets (each worth 8 1/3 % of the course grade). The final exam is scheduled for Wednesday May 9 between 6:20 and 8:20 pm.

For extra credit equal up to 10% of the course grade, you may write a short paper (approximately 10 pages long) in which you undertake an econometric analysis of an economic theory. I will give you more details about the paper as the semester progresses.

My experience has indicated that class attendance is important. People who attend class get better grades. So, don't skip classes. To encourage greater attendance, I will take attendance in class randomly through the semester. You will get up to 2 % extra credit on the course grade based on your attendance record. For example, if you attend one-half of the classes in which I take attendance you will receive an extra 1% credit on your final grade. Thus, if your final grade is 79% you will receive an 80% for the course.

**Accommodations for Students with Disabilities:** University policy regarding students with disabilities is defined at <http://rds.colostate.edu/>

**Office Hours:** T 3:30 - 4:30 p.m. W 2:00- 3:00 pm and by appointment.

## Academic Integrity

The University takes academic integrity seriously. At a minimum, academic integrity means that no one will use another's work as their own. Of course, academic integrity means more than just avoiding plagiarism. It also involves doing your own reading and studying. It includes regular class attendance, careful consideration of all class materials, and engagement with the class and your fellow students. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community.

Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, we will ask to you sign the CSU Honor Pledge as part of completing all of our major assignments. While you will not be required to sign the honor pledge, we will ask each of you to write and sign the following statement on your papers and exams:

*"I have not given, received, or used any unauthorized assistance."*

## Course Outline

<b>Topic</b>	<b>Reading</b>
<b>I. Introduction &amp; Review of the (Multiple) Linear Regression Model (LRM)</b>	Parts of Chs. 3, 5 & 7.
<b>II. Extensions of the LRM: the Generalized Linear Regression Model</b>	
<b>(A) Heteroskedasticity</b>	Ch. 8
<b>(B) Serial Correlation and Time Series Data</b>	Chs. 10 & 12
<b>III. Panel Data Methods</b>	Chs. 13 & 14
<b>IV. Instrumental Variables Estimation and Two-Stage Least Squares</b>	Ch. 15
<b>V. Experiments and Natural Experiments</b>	Ch. 13 (part) & notes
<b>VI. Simultaneous Equation Models</b>	Ch. 16
<b>VII. Limited Dependent Variable Models and Sample Selection Corrections</b>	Ch. 17 & (possibly) notes.