

Econ 30335-01: Introduction to Linear Regression

Spring 2025

University of Notre Dame

Course Details

Instructor: Coleson Weir

Email: cweir2@nd.edu

Office: Jenkins Nanovic Hall 3018

Office Hours: Wednesday 3:15 - 5:15 pm (JNH 3002) or by appointment

Class Meeting Times: Friday from 10:30 am -11:45 pm

Class Location: DeBartolo Hall 208

Class Site: canvas.nd.edu

Course Overview

In economics, we use statistical methodology to assess and evaluate a theory's merits, as well as make predictions and forecasts. This class is a supplement to Statistics courses that do not cover linear regression, which is a prerequisite for Econometrics. This course introduces linear regression models focusing on parameter estimation, hypothesis testing, goodness of fit, and estimation issues that arise when using economic data. This course will also prepare you for future work in economics, particularly Econometrics. You will also be introduced to the use of econometric software (Stata). We will discuss linear regression models, hypothesis testing, and multiple regression (Chapters 14-15). You will have opportunities to apply these concepts through problem sets, additional readings, and a final project. By the end of the semester, you should be able to read and understand basic economic research that uses the techniques we have developed in class. Further, you will be able to use Stata to implement the techniques we learn in the class.

Tentative Course Outline

Date	Topic	Readings	Problem Sets	Final Project
3/21	Introduction & Statistics Review	Ch. 7, 8.2, 9.1, 9.4, 9.6		
3/28	Simple Linear Regression	Ch. 12	PS1 Due	
4/4	Linear Regression in Stata		PS2 Due	Question and Data Set
4/11	Multiple Regression	Ch. 15 (not 15.9)	PS3 Due	
4/18	No Class – Easter Holiday			First Draft Due by 11:59 pm
4/25	Causal Inference, Regression in Practice			Feedback
5/8	No Class			Final Draft Due by 12:30 pm

Course Material

1. I recommend you obtain Essentials of Statistics for Business and Economics by Anderson, Sweeney, and Williams (ASW). Any edition will be fine, get the least expensive option that you can find. I will not use the textbook much, so it is up to you if you want to purchase the book.
2. Access to a computer with statistical software Stata.

Using Stata

Below are multiple ways to get access to it:

1. Purchase [STATA](#): You can purchase a six-month license of STATA/BE for \$48. Note that the software will not run on a Chromebook.
2. Notre Dame Campus Computers: You can access STATA in-person on the Notre Dame library computers. Note with this option you need to be careful to save your work on Google Drive or by some other means so that you don't lose your work.
3. Notre Dame's Virtual Computer Lab: You can access a virtual Notre Dame computer with STATA on it from your own computer. The connection can be slow. Note with this option you need to be careful to save your work on Google Drive or by some other means so that you don't lose your work.

Grades

Final grades for the course will be based on the following:

Problem Sets	60%
Final Project	40%
Total	100%

Problem Sets

A total of 3 problem sets will be assigned throughout the course. The problem sets will be posted on Friday through Canvas. Submissions will be accepted through Canvas and **will be due Fridays at 10:29 am (right before class)**. Submissions should be uploaded as a PDF. You are encouraged to work in groups on the problem sets, but please turn in your own solutions. Keep in mind that the problem sets are designed to help you grasp and apply the concepts discussed in class and consequently the project, so the more you put into them, the more you get out of them. Each problem set, therefore, accounts for 20% of your overall course grade. Late problem sets will not be accepted. Failure to turn something in on time will result in a 0%. If you need an extension on a problem set, please email me regarding your circumstances. I will provide solutions to all the problem sets after they have been submitted.

Problem sets will contain several questions requiring you to use math, tables, graphs, and or words in your answer. They may also contain a few true/false and/or multiple choice questions. Some problem sets will include STATA problems which require access to the software.

Final Project

This project will be the culmination of the course's work. Other than familiarizing you with how to generate interesting research topics, it will incorporate all that you will learn in class this semester: identify variables and data, formulate a linear regression model, use least square estimation, and conduct hypothesis testing. In addition, it will involve using your Stata skills. For this project, you will be asked to come up with a linear regression model that takes the concepts we will be learning in class into the "real" world. You are required to formulate a regression model, find data to estimate the model using least squares (coefficients, standard errors, and confidence intervals) and conduct a hypothesis test of significance and submit a report of your data analysis result for this course. Linear regression is all about being able to apply the techniques that you learn in the classroom to the real world, to better understand data for different purposes. The project will be completed in three phases, as specified on the course schedule:

1. Question & potential data source: Your first task is to identify an interesting question for your research. **By Friday, April 4 at 11:59 pm**, you need to submit a one paragraph document to Canvas outlining a topic that you are interested in and data sources from which you can get data related to your topic. If you are struggling with a research idea or data, come see me and we will figure out what is best for you. You may collect your data via an observational study or survey.
2. First Draft: The first draft is **due on Friday, April 18 at 11:59 pm**, via Canvas. To receive full credit, you must submit a document that clearly outlines your **research topic, data set, data sources and does some initial analysis of the data**. The quality and amount of initial analysis you do is up to you and won't alter your grade, but you do need to have some initial analysis. The first draft is meant to be a place for you to explore your data and get as much feedback as you would like. The more detailed and complete your analysis is, the better feedback I will be able to provide you, which will make your final draft much better and easier to complete. It should be anywhere from 2-3 pages. Approximately within a week after you submit your first draft, you will receive feedback from me.
3. Final report: **Final draft is due Thursday, May 8 at 12:30 pm**, via Canvas. The final report should be between 4-6 pages long including all tables, graphs, and figures. In your final draft you should include a complete statement of your problem, data description, and source, methodology, findings, and interpretation (including estimated coefficients, standard errors, and confidence intervals), results from hypothesis testing for significance, and suggest additional variables that can be used to answer your question in a multivariate regression framework. All Stata files should be submitted via Canvas.

Your projects will be graded based on:

1. Consistency: Did you answer your question of interest?
2. Clarity: Is it easy for your reader to understand what you did and the arguments you made?
3. Relevancy: Did you use statistical techniques wisely to address your question?
4. Interest: Did you motivate your question?

Class Attendance and Participation

Class participation is vital to success in this course. It will be nearly impossible to do well in this course without regular attendance. Unless you have a legitimate excuse (family or health related emergency, NCAA athletics competition away, or job interview), please make every effort to attend class and not leave early. When you must miss a class, it is your responsibility to get the assignments from me or a classmate. I will be more than happy to help you with course material outside of class as long as you attend class and put forth the proper effort.

Grading

The grade distribution for the course is as follows: (s denotes your total score)

A	$s \geq 93$	C+	$77 \leq s < 80$
A-	$90 \leq s < 93$	C	$73 \leq s < 77$
B+	$87 \leq s < 90$	C-	$70 \leq s < 73$
B	$83 \leq s < 87$	D	$60 \leq s < 70$
B-	$80 \leq s < 83$	F	$s < 60$

I will be using the gradebook on the course website through Canvas. This will allow you to keep close track of your performance in the course.

Academic Honesty

You are expected not to engage in academic dishonesty. One of the goals of this course is to prepare you to do well in advanced economics courses, and build the basic foundations of regression analysis for research projects and future careers, so it is essential that you develop a solid understanding of the material. To that end, while collaboration on problem sets is encouraged in this course, copying is not. Students are expected to understand and abide by the University's honor code.

Support for Mental Health:

The University Counseling Center (UCC) provides cost-free and confidential mental health services to help you manage personal challenges that threaten your emotional or academic well-being. Remember, getting help is a smart and courageous thing to do. For more resources, please see ucc.nd.edu. For course-related concerns, you can also speak with me at any time.

Disability Services:

It is the policy and practice of the University of Notre Dame to provide reasonable accommodations for students with properly documented disabilities. Students who have questions about the Office of Disability Services or who have, or think they may have, a disability are invited to contact the Office of Disability Services for a confidential discussion in the Sara Bea Center for Students with Disabilities or by phone at (574) 631-7157. Because the University's Academic Accommodations Processes generally require students to request accommodations well in advance of the dates when they are needed, students who believe they may need an accommodation for this course are encouraged to contact the Office of Disability Services at their earliest opportunity. Additional

information about Disability Services and the process for requesting accommodations may be found at supportandcare.nd.edu.

Inclusive Classroom:

The University of Notre Dame is committed to social justice. I share that commitment and strive to maintain a positive learning environment based on open communication, mutual respect, and non-discrimination. In this class, we will not discriminate on the basis of race, sex, age, economic class, disability, veteran status, religion, sexual orientation, gender identity, color, or national origin. Any suggestions as to how to further such a positive and open environment will be appreciated and given serious consideration.

Title IX:

Lauren's Promise: I will listen and believe you if someone is threatening or harassing you.

Lauren McCluskey, a 21-year old student at the University of Utah and the daughter of economist Jill McCluskey was murdered on Oct. 22, 2018 by a man she briefly dated. I am committed to doing what I can to make sure this does not happen again.

If you are in immediate danger, call 911. If you are experiencing sexual assault, domestic violence, stalking, or harassment you can report it to me. You should be aware that I am a mandatory reporter, which means that I am required to report these instances to the university's Title IX Coordinator or Deputy Title IX Coordinator to investigate. You can also learn about your options (on-campus and off-campus, confidential and not) at <http://titleix.nd.edu>.

The University of Notre Dame provides services for those who have been affected by sexual assault, sexual misconduct, dating or domestic violence, stalking and any conduct that creates a hostile environment. For help and further information including contact information for on and off-campus resources, please consult <https://titleix.nd.edu/support-resources>.