Course Details

Instructor: Colin Davison

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Office: Jenkins Nanovic Halls 3083

Office Hours: Thursdays 9:00am-12:00pm

Class Meeting Times: Friday from 2:00pm-3:15pm

Class Location: DeBartolo Hall 311

Class Site: canvas.nd.edu

Textbook: "Essentials of Statistics for Business & Economics" by Anderson, Sweeney, Williams, Camm, and Cochran. The textbook is optional but is a good resource for reviewing the material. Any edition will be fine, you can get the least expensive option.

Software: You will need access to a computer with 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.

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. The course introduces linear regression models focusing on parameter estimation, hypothesis testing, the goodness of fit, and estimation issues that arise in using economic data.

We will discuss linear regression models, hypothesis testing, and multiple regression (Chapters 14-15) and you will have opportunities to apply these concepts through additional readings that utilize the concepts and methods discussed in class. 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 the course. Further, you will be able to use STATA to implement the techniques we learn in the course.

Tentative Course Outline

Date	Topic	Readings
10/28	Introduction & Statistics Review	Ch. 7, 8.2, 9.1, 9.4, 9.6
11/4	Simple Linear Regression	Ch. 14
11/11	Linear Regression in STATA	
11/18	Multiple Regression	Ch. 15 (excluding 15.9)
12/2	Causal Inference, Regression in Research/Practice	

Poll Everywhere

We will use Poll Everywhere software to facilitate interaction during class. During lectures, I will often pause to present in-class problems or questions. You will then use your phones/tablets to input a response, and the anonymized distribution of responses will immediately be displayed in the slides. In-class questions allow you to actively participate in class and give me a sense of how well I am doing. During the first week of class, I will provide you with a link for free registration with Poll Everywhere. Please do not plan on using a laptop as a means for answering clicker questions.

Electronic Device Policy

Other than using phones/tablets as means to access Poll Everywhere, no electronic devices (i.e., laptops) are permitted during class. If you think that taking notes on a laptop/tablet would be especially beneficial for you, please talk to me and we can discuss an exception. If you are observed using an electronic device for any reason other than Poll Everywhere, this will be grounds for a reduction in your participation grade.

Videos of Class

I am planning to record our class times so that you all can reference them later when you are studying the material and doing problem sets. You will be able to find the videos at canvas.nd.edu > Panopto Video. Students will not be visible in the

videos; the video will only show me, the chalkboard, and screen sharing. The videos are meant to be for your benefit. If you are concerned that a recording of the class inhibits your ability to actively participate, please come see me.

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.

Accessibility Support

Students who have questions about Sara Bea Accessibility Services or who have, or think they may have, a disability are invited to contact Sara Bea Accessibility Services for a confidential discussion by emailing sarabeacenter@nd.edu 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 Sara Bea Accessibility Services at their earliest opportunity. Additional information about Sara Bea Accessibility Services and to and to learn more about the student process for requesting accommodations, please visits Accessibility Support.

Mental Well-Being

Being a student can feel overwhelming at times. To help with this, I have designed my course using trauma-informed teaching principles. The University Counseling Center is there to help you and provides a safe, confidential, nonjudgmental space where students can explore a wide variety of issues and concerns. Their services include crisis intervention, brief consultations, workshops, Drop-In services, group and individual counseling, psychiatric care for medication management, and referrals to off-campus treatment providers. All UCC services are confidential, free, and available to all degree-seeking students currently enrolled at the University of Notre Dame.

Grading Rubric

Final grades will follow the traditional +/- scale: A = 93-100, A- = 90-92.99, B+ = 87-89.99, B = 83-86.99, B- = 80-82.99, C+ = 77-79.99, C = 73-76.99, C- = 70-72.99, D = 60-69.99, F = 59.99 and below.

Participation: 10%

Participation in the class is essential for your success and the success of others. These points are "easy" to get! All you need to do is attend and participate in class, complete the ungraded in-class assignments through Poll Everywhere, and comply with the laptop/phone policy. These points are awarded by my discretion. I will not be taking attendance at the beginning of class, but I will notice if you are repeatedly absent which would be grounds for losing participation points.

Problem Sets: 40%
There will be three problem sets throughout the course with each one accounting for ~13% of your overall course grade. The problem sets will be posted on Friday through Canvas. Submissions will be accepted through Canvas and will be due Fridays at 1:59 pm (right before class). 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. Late problem sets will receive a maximum of 75%. Problem sets will contain a mixture of objective true/false and/or multiple-choice questions, along with several questions requiring you to use math, tables, graphs, and or words in your answer. Some problem sets will include STATA problems for which you will require access to the software.

Item	Due Date
Problem Set #1	11/4
Problem Set #2	11/11
Problem Set #3	11/18

Final Project: 50%
This project will be the culmination of the course's work. It will incorporate all that you will learn in class this semester: identifying data and variables, formulating a linear regression model, use least square estimation, and conducting 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 will come up with a research question of interest, find data, formulate a regression model that relates your variables of interest, estimate the model using least squares (coefficients, standard errors, and confidence intervals), conduct a hypothesis test of

significance, and submit a report of your data analysis. Linear regression is all about being able to apply the techniques that you learn in the classroom in real world to better understand data for different purposes. The following table shows the schedule and deadlines for your final project:

Item	Date
Topic & Potential Data Set	11/11
First Draft	11/18
Receive Feedback on First Draft	11/25
Final Draft	12/9

- **Topic & Potential Data Set:** Your first task is to identify an interesting question for your research. By Friday, November 11th at 11:59pm 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, you need to come see me, and we will figure out what is best for you.

- **First Draft:** The first draft is due on Friday, November 18th at 11:59pm via Canvas in PDF format. 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 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 1-3 pages.

- **Final Draft:** The final draft is due on Friday, December 9th at 11:59pm via Canvas in PDF format. The final report should be between 3-5 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.

- Grading Rubric for Final Project

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