Economics 4848 Applied Econometrics
Spring 2017

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Course Description

Applied Econometrics provides an overview of econometric techniques commonly used in applied research in microeconomics. Methods and topics covered in this course will help students develop a deeper understanding of econometrics as well as learn to use STATA, a statistical software package commonly used in economics. Learning to use STATA will take a significant amount of time and effort but will be extremely valuable as it is much more powerful than what you can do in Excel, EViews, etc. Students will apply the econometric models using data from the US Census Bureau and the Bureau of Labor Statistics. In addition, students will be able to apply these skills to a research topic of their choosing.

Typically each week we will discuss the theory for the current topic and then spend some time working with data to apply the theory in STATA. This data analysis that we do in class will be similar to your assignments, however the theory portion will also be covered on exams.

Prerequisite

This class requires previous completion of Economics 3818, Intro to Statistics, or the equivalent.

Course Materials

There is no required text but you may find the following resources helpful:

- Introductory Econometrics: A Modern Approach by Jeffery M. Wooldridge
- Using Econometrics: A Practical Guide by A.H. Studenmund
- Prof. Brian Cadena's Econ 4848 Course Pack (available for purchase from the bookstore)

Software: We will be learning to use a statistical software program called STATA in class. For all assignments, projects, and exams you will be required to complete all analysis using STATA. Students are not required to purchase their own copies of STATA, as it is available in the computer lab in the basement of the economics building. Note that the economics building is closed on weekends, but remains open until 10pm on weekdays. If you choose not to buy Stata, please plan your work time accordingly. No late assignments will be accepted because you could not access the computer lab on the weekend. Stata is also available in the Benson computer lab. You can find a list of other campus labs with STATA at: http://webdata.colorado.edu/labs/softwaresearch/

If you choose to purchase your own copy of STATA, it will allow you to work on assignments and your research project outside the computer labs. Students can receive a discount on the software through the Universitys GradPlan. Information is available at: http://www.stata.com/order/new/edu/gradplans/student-pricing/ Please note that Small Stata (which only allows for 1,200 observations) will not be sufficient for this course. I would suggest Stata/IC license which is $75 for 6 months.

Hardware: You will need a USB memory device to store copies of data and log files from our work in class.

Grade Breakdown

Grades for this course will be based on the following criteria:

Assignments (20% total)
2 Midterm Exams (20% each)
Final Exam (20%)
Research project and presentation (20%)

Final grades will be determined by your cumulative performance at the end of the semester, and this may or may not correspond to the typical ten-point grading scale (A's are 90-10, B's are 80-89, etc.) If the final distribution of grades are lower than expected, I reserve the right to change the grading scale at that time.

Assignments (20% total): Students may work alone or with **one** other student. If you work with a partner please upload one assignment for both of you. Assignments must be uploaded on D2L 30 minutes before class time on the day they are due. No late assignments will be accepted for any reason. Your lowest homework assignment will be dropped from your overall score for the course. While you will be able to work with a classmate on your homework, your exams will be completed individually. Therefore, it is in your best interest to ensure you fully understand the material.

Midterm Exams (20% each): Midterm exams will be held on Feb. 24 and Mar. 24 during the regularly scheduled class time. The exams will be similar to your homework assignments in that you will be given some data to analyze with accompanying questions and a few theory based questions. Given the nature of programming in STATA and this course, all exams should be considered "cumulative" in the sense that you will need to know how to any and all of the tasks we've learned throughout the semester.

Students must take exams at scheduled times so ensure now that you can attend class the dates of the exams. Exams may not be taken early/late and no make ups are given. If you must miss a midterm exam due to an emergency the weight of the midterm will automatically be divided between the other midterm and final exam making each worth 30% of your grade. Midterm exam scores will not be dropped due to poor performance or lack of preparation. You **cannot** miss both midterm exams.

Final Exam (20%): The final exam is due Thursday, May 10th at 8:00pm.

Students with documented disabilities who may need academic accommodations should speak with me during first three weeks of the class. Also contact the Disability Services Office, Willard 322 (phone 303-492-8671).

Research Project and Presentation (20%): Students may work alone or with **one** other student on a research project applying what you've learned in the course. Your written project is due by 8:00pm on Sunday, May 7th. You should start thinking about your research topic as soon as possible at the beginning of the semester. Your project should pose a testable economic question that can be answered using one of the techniques we discuss in applied econometrics. A sample outline of what to include in your project: Introduce your research question and why it is an important topic to study, citing any relevant sources. Describe the data and empirical technique(s) you use. Conduct one or more types of empirical analysis on your data using techniques from the course. Discuss and interpret your empirical findings. (Roughly 8 pages, double-spaced, including figures and tables.) All tables or figures included should be **nicely formatted and concise, i.e. not just copy/pasted from the STATA output**. Part of your grade on each portion of the project is how well you have addressed my comments and suggestions from previous project assignments.

Your research question must be something that can be answered using the types of information available in the US Census data. We will spend time in class on what is available and how to extract and build your data set from the Census data. This data source is required to be used by all students unless given special permission by the instructor.

As part of your grade for the project, a research proposal will be due on March 17th and a rough outline of the project and findings on Apr. 7. Individual meetings will be scheduled the week of Apr. 10th. In addition, each student/group will give a presentation the last week of classes (May 1-5) discussing their research question, data, methods, and results. Both students must present part of their project if working in a group.

Your overall grade for the final project will be determined as follows: Proposal (5 points), Corrections to Proposal (5 points), Outline & Data (10 points), Corrections to Outline in Presentation (5 points), Presentation (5 points), Final Paper (10 points)

Additional Policies

Attendance: *Attendance is an absolute necessity in this course.* It is where I can help guide you in learning STATA and completing a good research project, and you can get feedback on where improvement is needed. Students are expected to be in attendance **on time** for every class, as it may be difficult for you to make up the material and fully understand programming in STATA otherwise. It is your responsibility to obtain any material/notes from a class you miss from one of your classmates. Attendance will be recorded every class period and any student missing more than 9 class periods will automatically fail the course. These absences up to 9 are intended to cover any manner of reasons why you might need to miss class, valid or otherwise. These penalties are **non-negotiable**. Those arriving late, leaving before class is dismissed, spending

significant time on non-class activities will also be counted as absent.

Honor Code: All students are responsible for knowing and adhering to the academic integrity policy of the University of Colorado at Boulder (www.colorado.edu/policies/honor.htmlandwww.colorado.edu/academics/honorcode/). All incidents of academic misconduct will be reported to the Honor Code Council and will result in a failing grade for the course. In particular, since students will be completing a research project be careful to avoid plagiarism (portrayal of anothers work or ideas as ones own) and therefore to conscientiously identify and cite all ideas or language borrowed from any other work.

Classroom Behavior: Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the student code.

Since the course is in the computer lab, I realize that there can be the temptation to work on other things during lecture, browse the internet, etc. However, as a courtesy to me and your classmates, as well as to ensure you understand the presented material, I ask that during lectures (non-lab activities) you only use the computers to follow along with the slides and not for any other purpose.

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127.

Tentative Class Schedule

Assignments are due at the beginning of class unless otherwise noted.

Week	Content	Assignments
Week 1	• Jan. 18-Jan. 20: Course Information • Conducting Economic Research, types of data	
Week 2	• Jan. 23-Jan. 27: Introduction to STATA • Creating Variables	
Week 3	• Jan. 30-Feb. 3: Exploring Continuous Data, Categorical Data • Data management, Error checking	Homework 1 Due 1/30
Week 4	• Feb. 6-Feb. 10: Bivariate Regression • Hypothesis Testing	Homework 2 Due 2/6
Week 5	• Feb. 13-Feb. 17: Distribution of $\hat{\beta}$ • Classical Assumptions and Violations, Choosing a functional form	Homework 3 Due 2/13
Week 6	• Feb. 20, 22: Simple Multivariate Regression, Review • Example research paper • Fri., February 24: **Midterm Exam 1**	
Week 7	• Feb. 27-Mar. 2: Non-linear Models • Categorical Variables in Regressions	Homework 4 Due 2/29
Week 8	• Mar. 6-Mar. 9: Interaction Models	Homework 5 Due 3/6
Week 9	• Mar. 13-Mar. 17: Multicollinearity, Omitted Variable Bias	Homework 6 Due 3/13 Proposal Due 3/17 at 8pm
Week 10	• Mar. 20, 22: IPUMS Tutorial • Fri., March 24: **Midterm Exam 2**	Homework 7 Due 3/20
Week 11	• Spring Break: No Classes	
Week 12	• Apr. 3-Apr. 7: Heteroskedasticity, Serial Correlation	Outline Due 4/7 at 8pm
Week 13	• Apr. 10-Apr. 14: Individual Meetings • Schedule TBD	Homework 8 Due 4/10
Week 14	• Apr. 17-Apr. 20: Panel Data, Fixed Effects	
Week 15	• Apr. 24-Apr. 27: Limited Dependent Variables	Homework 9 Due 4/24
Week 16	• Project Presentations • Schedule TBD	Presentation Due 5/1 Paper due 5/7 at 8pm
Week 17	• **Final Exam** due Thursday, May. 10th at 8:00pm	