

Economics 4848 Applied Econometrics

Spring 2021

Jennifer Klein. Ph.D.

Email: jennifer.klein@colorado.edu

Office Hours: T 11am-noon, F 1:45-2:45pm

Zoom ID for OH: 985 9634 1125

Website: Canvas

TA:

Office Hours:

Email:

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 behind the techniques we use will also be covered on exams.

This course is listed as online-remote. This means that our course sessions will be conducted synchronously [via Zoom](#) and you will be expected to be able to join during class time from 9:35-10:50am on Tuesdays and Thursdays.

This class requires previous completion of Econ 3070, Intermediate Micro, and Econ 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

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. You will be able to access the computer lab remotely during class if you do not have STATA on your own computer. Please review the instructions posted on Canvas for how to remotely access the labs.

If you choose to purchase your own copy of STATA, it will allow you to work on assignments and your project outside the computer labs. Students can receive a discount on the software through the University's GradPlan. Information is available at: <http://www.stata.com/order/new/edu/gradplans/student-pricing/>. I would suggest Stata/IC license which is \$48 for 6 months.

Grade Breakdown

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

- Class Participation (5% total)
- Assignments (10% total)
- Data project and presentation (20%)
- 2 Midterm Exams (20% each)
- Final Exam (25%)

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 90-100, B's are 80-89, etc.)

Class Participation (5% total): Each day will be worth up to 5 points for attending and participating in class. Students who are late or leave early will receive only partial points for the day. Students not in attendance or not answering any questions receive a 0 for the day. We will be using a free website called Socrative to facilitate in class practice questions. Socrative is available for your phone or tablet in the App Store and Google Play Store, or as a website on your laptop (<https://b.socrative.com/login/student/>). The lowest three scores will be dropped.

Assignments (10% 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 Canvas by 11:00pm 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 **February 23** and **March 18**. 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. Exams will be taken on Canvas.

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. Exam scores will not be dropped due to poor performance or lack of preparation. You **cannot** miss both midterm exams.

Final Exam (25%): The final exam is **Monday, May 3rd** on Canvas. This exam cannot be skipped or taken at another time so plan accordingly.

Data Project and Presentation (20%): Students may work alone or with **one** other student on a data analysis project applying what you've learned in the course. Assignments are due at 11:00pm unless otherwise noted. Your written project is due by **11:00pm on Monday, December 7th**. You should start thinking about your 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 and using individual level data. 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.

As part of your grade for the project, your chosen research question will be due on **Feb 24**, a project proposal will be due on **March 8**, your cleaned data set will be due on **March 29**, and your preliminary analysis will be due on **April 12**. Individual meetings will be scheduled the week of April 12-16, in lieu of regular class. In addition, each student/group will give a presentation the week of April 26th discussing their research question, data, methods, and results. Both students must present part of their project if working in a group. Due dates for these portions of your project appear in blue in the schedule.

Your overall grade for the final project will be determined as follows: Research Question (5 points), Project Proposal (15 points), Data set submission (10 points), Initial Data Analysis (15 points), Presentation (20 points), Final Paper (30 points), Corrections to Assignments (5 points).

Additional Policies

Spring Pause: The week of March 22-26 will be used in this class as a spring pause to provide us all with a safe and supportive way to promote health, wellness and learning without leaving campus. During this week, we won't have any exams or assignments due. We will still have class with required attendance on March 23rd. I wish we could take a regular spring break, but public-health concerns prevent us from doing so. I would like to emphasize that it is still important for you all to behave responsibly. Do not use the week to travel or engage in risky behavior that could result in an outbreak on campus.

Requirements for COVID-19: As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders
- clean local work area

- practice hand hygiene
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert [CU Boulder Medical Services](#).

Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to [Student Conduct and Conflict Resolution](#). For more information, see the policies on [COVID-19 Health and Safety](#) and [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the Accommodation for Disabilities statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#).

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the [Health Questionnaire and Illness Reporting Form](#) remotely. In this class, if you are sick and unable to join class remotely, please let me know so we can make a plan to keep you on track.

Disability Accommodations: If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions](#) on the Disability Services website.

Religious Observances: Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. See the campus policy regarding [religious observances](#) for full details.

Honor Code: All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273) and will result in a failing grade for the course. Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at the [Honor Code Office website](#). This misconduct

includes, but is not limited to: Represent the work of others as their own, Use or obtain unauthorized assistance in any academic assignment, Give unauthorized assistance to other students, Modify, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit, Misrepresent the content of submitted work.

Sexual Misconduct, Discrimination, Harassment, and/or Related Retaliation: CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#) and the campus resources can be found at the [OIEC website](#).

Please know that faculty and graduate instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Classroom Behavior: Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. 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 race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the [policies on classroom behavior](#) and the [student code](#).

Preferred Names and Pronouns: CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name. I will be glad to honor any requests that I use a different name or pronoun in class.

Attendance: *Attendance is an absolute necessity in this course.* It is where I can help guide you in learning STATA and completing a 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. This course typically has a long waitlist of students trying to enroll in the class. So, in-line with department policy, if a student does not attend class for the first three class periods he/she/they will be administratively dropped from the course to make room for others on the waitlist.

Tentative Class Schedule

Week	Content	Assignments
Week 1	January 14 <ul style="list-style-type: none"> • Course Information, types of data 	
Week 2	January 18-22 <ul style="list-style-type: none"> • Statistics and Sampling • Introduction to STATA 	
Week 3	January 25-29 <ul style="list-style-type: none"> • Creating Variables • Exploring Continuous Data 	Homework 1 Due 1/29
Week 4	February 1-5 <ul style="list-style-type: none"> • Exploring Categorical Data • Bivariate Regression 	
Week 5	February 8-12 <ul style="list-style-type: none"> • Distribution of $\hat{\beta}$ • Hypothesis Testing 	Homework 2 Due 2/12
Week 6	February 15-19 <ul style="list-style-type: none"> • Goodness of Fit Measures • Multivariate Regression, Project Overview 	Homework 3 Due 2/19
Week 7	<ul style="list-style-type: none"> • Tues, February 23: Exam 1 • Thurs, February 25: Non-linear Models 	Research Q due 2/24
Week 8	March 1-5 <ul style="list-style-type: none"> • Categorical Variables in Regressions 	Homework 4 Due 3/1
Week 9	<ul style="list-style-type: none"> • Tues, March 9: Limited Dependent Variables • Thurs, March 11: Practice on own 	Homework 5 Due 3/8 Proposal Due 3/12
Week 10	<ul style="list-style-type: none"> • Tues, March 16: ACS/CPS Tutorial • Thurs, March 18: Exam 2 	Homework 6 Due 3/15
Week 11	<ul style="list-style-type: none"> • Tues, March 23: Omitted Variable Bias • Thurs, March 25: No Class - Wellness Day 	
Week 12	<ul style="list-style-type: none"> • Tues, March 30: Multicollinearity, Heteroskedasticity • Thurs, April 1: Practice on own 	Data Set Due 3/29
Week 13	April 5-9 <ul style="list-style-type: none"> • Time Series Data • Serial Correlation 	Homework 7 Due 4/5
Week 14	April 12-16 <ul style="list-style-type: none"> • Individual Meetings, Schedule TBD 	Prelim. Analysis Due 4/12
Week 15	April 19-23 <ul style="list-style-type: none"> • Panel Data 	
Week 16	April 26-30 <ul style="list-style-type: none"> • Project Presentations, Schedule TBD 	Presentation Due 4/26
Week 17	<ul style="list-style-type: none"> • Final Exam Monday, May 3rd 	Paper due 5/5