Economics
UNIVERSITY OF COLORADO BOULDER

Prof. Chrystie Burr
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MW, 10:20-11:10
Synchronous Online Learning
Course Canvas site

Economics 4848-001
Applied Econometrics
Fridays, Prerecorded videos
(303)492-0863
Zoom Office Hours: MW 11:10-11:40

Course Description:
This course is designed to offer you solid foundation in empirical econometrics and experiences in analyzing real life data. Most importantly this course can provide you with critical skills in the *Age of Big Data*. In doing so, we will first review the basic theoretical concepts in probability and statistics in order to understand regression models and hypothesis testings. Meanwhile we will spend a substantial amount of time mastering R, a freely available statistical computer software package. You will learn to use R to conduct descriptive and regression analysis using rigorous statistical methods and models.

Prerequisite(s):
To enroll in the course, you must have completed Economics 3818 or an equivalent course. We will review the necessary math tools with the assumption of prior exposure. Students with a continuing interest in econometrics will find complementary material in Economics 4818 as it provides more depth at the theoretical level.

Course Materials:

1. Optional textbook and notes:
   Introductory Econometrics: A Modern Approach by Jeffrey M. Wooldridge. 5th Edition.
   Introduction to Econometrics by James H. Stock and Mark W. Watson. 3rd Edition.
   Prof. Cadena's Coursepack (available at the CU Bookstore)
   Using Econometrics: A Practical Guide by A.H. Studenmund. 6th Edition.
   Using R for Introductory Econometrics by Florian Heiss
   Online resources:
   Introduction to Econometrics with R (ebook)
   An Introduction to R (pdf)

2. Additional lecture notes will be posted on the course website.

Course Objectives:
At the completion of this course, you will be able to:

1. Be familiar with basic probability and statistical terms and models.
2. Conduct regression analysis on real-life data in a meaningful way.
3. Understand the power and the limits of regression analysis.

4. Construct hypothesis and use proper statistical testing to "accept"/reject the hypothesis.
5. Demonstrate the ability to conduct meaningful economic research by a) proposing research question(s) b) acquiring necessary data (c) analyzing data (d) interpreting the results from (c) to address (a).

Grade Distribution:

Assignment	Weight	Due Date
In-class participation	15%	
Clicker Questions	10%	
Homework	15%	
Midterm	20%	March 3 During class time
Research Project	20%	April 29
Final Exam	20%	May 2 1:30-4pm

Course Policies:

- **General**
  - Attendance is critical to success in this class. Attendance will be taken for each live lesson and only counts if your webcam is on.
  - At the beginning of the semester and during the review of probability and statistics, you will be presenting assigned topics during the class time and it accounts for a meaningful portion of your final grade (15%). Do your best!
  - Midterm and Final exam format will be announced two weeks prior to the exam dates.
- **Exams**
  - There will be one midterms and a final exam. The final exam is *comprehensive* and is scheduled: May 2 1:30 - 4pm.
- **Research Project**
  - One of the main goals of this class is to train you to be able to perform original economic analysis of the data. You will have a choice to either work independently on a research paper or join the class to work on one large project related to the COVID19 pandemic. I will discuss more details on this class project during the first day of lecture.

Additional Notes and Policies:

Distance Learning Etiquette

Be prepared to learn and participate in the discussions during each class. Be courteous to each other especially in the online environment. Dress properly for the zoom meetings (I expect your video to be on during lectures.) even though you're at home. Mute your microphone unless you are talking. This is a relatively small class so I expect it will be fine for you to ask questions or provide comments whenever. You can ask questions during lectures either verbally by using your microphone or send me texts through chat. I will update the policies if necessary.

Academic Integrity

In addition to skills and knowledge, your University education also aims to teach students appropriate Ethical and Professional Standards of Conduct. Detailed policies can be found on the University website. All incidents of academic misconduct will be reported to the Honor Code

Council. All work and ideas should be properly cited. Any type of plagiarism when discovered defaults to a failing grade in this course. The bottom line: When in doubt, DO WITHOUT !

Special Accommodations:

If you require special accommodation because of disability, please submit a letter from Disability Services in a timely manner (at least two weeks before the exams or other due dates). Disability Services determines accommodations based on documented disabilities. You may contact Disability Services at 303-492-8671 or b email at dsinfo@colorado.edu

If you have a temporary medical condition or injury, see Temporary Injuries for guidelines and discuss your needs with your professor.

Missed Exams

Midterm exam absences will only be excused for compelling circumstances (family emergencies or documented illness) and make-up exam will be provided. Students anticipating conflict with an exam due to religious observance or over-scheduling (3 or more exams on the same day) should bring these to my attention within the first 3 weeks of class.

Preferred Student 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.

Topics to be covered (Chapters are based on Wooldridge 6th ed.):

- Intro & Review
  - Unit 1: Introduction to quantitative economic researches (Ch. 1)
  - Unit 2: Introduction to R
  - Unit 3: Review of probability and statistics (Append. B *&* C)
  - Unit 4: Confidence Interval *&* Hypothesis Testing (Append. C)
  - Unit 5: Descriptive and graphic analysis with R
- Regression Analysis
  - Unit 6: Overview of regression analysis
  - Unit 7: Ordinary least square (OLS) (Ch. 2)
  - Unit 8: Simple regression model
  - Unit 9: Multivariate regression model (Ch. 3)
  - Unit 10: The classical OLS model assumptions (Ch. 2)
  - Unit 11: Functional form specification
  - Unit 14: Simple time series analysis (Ch. 10)
  - Unit 15: Panel Data Method (Ch 13, 14)
  - Unit 16: Limited dependent variable models (Ch. 17)
  - Unit 17: Creating and sharing interactive graphics using R

"Live as if you were to die tomorrow. Learn as you were to live forever."

— Gandhi