ECON-4848-002 - Applied Econometrics

Fall 2020

Professor:	**Doctor Mahdieh Yazdani**	**Time:**	MWF 3:00 – 3:50
Email:	mahdieh.yazdani@colorado.edu		
TA:	**Mr. Brian Marein**		
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Course Description: The objective of this course is to learn how to analyze and interpret real-world data. This course provides practical hands-on training in using statistical software for empirical economics analysis. We will be using R (an open source programming language for statistical analysis and graphics). This course will enable you to carry out empirical studies in economics and related fields. The course will held remotely each MWF from 3:00 - 3:50 PM. You can easily attend the class by clicking on the link below:

https://cuboulder.zoom.us/j/91063228242

Office Hours: Mondays 2:00 - 2:50 pm, WF 12:30 - 1:30 pm, or by appointment.
You can attend my office hours by clicking on the link below:

https://cuboulder.zoom.us/j/94911422202

TA's Office Hours: Tuesdays 3:00 - 5:00 pm and Wednesdays 1:00 - 3:00 pm.

You can attend Mr. Marein's office hours by clicking on the link below:

https://cuboulder.zoom.us/j/94789364823

Prerequisites: To enroll in this course, you must have completed Economics 3818 (or equivalent). To succeed, students will need a basic understanding of math and statistics. Students interested in more theoretical parts of econometrics will find Economics 4818 as a complementary course.

Course Objective: By the end of the semester, you will be able to implement regression techniques in R to analyze data and will become proficient in interpreting the results. Throughout this course, we will make extensive use of the data-set provided by Jeffrey M. Wooldridge in his "Introductory Econometrics: A Modern Approach" textbook.

Students Learning Outcomes: By the end of this semester, the students will be able to

1. Acquire R programming skill.

2. Construct appropriate econometric models for a given problem and data-set, estimate their parameters, and test the hypothesis in R.

3. Interpret econometrics models, graphs, and tables.

4. Analyze data and apply empirical methods to guide decision-making. Articulate why a particular model might give misleading results and how to improve upon the model.

Textbook:

- Introductory Econometrics: A Modern Approach, 6th edition, by Jeffrey M. Wooldridge.

Attendance: Classes are interactive, and you will get the most out of this course by attending each class meeting. I will randomly take attendance at the start, middle, or the end of the class period.

Canvas website: Please make sure to check Canvas regularly for lecture notes, problem sets, announcements, and other updates regarding the course.

Problem Sets: There will be assigned 4 problem sets. You may work with a partner and turn in a single document. Your partner in assignments 1 and 3 would need to be different from your partner in assignments 2 and 4. The problem sets consist of codding in R, data analysis and might include few multiple choices. You are encouraged to form study groups of two. You should submit your codes, results, your analysis and interpretation. You need to type your analysis and interpretation in LaTeX. Assignments should be submitted on Canvas by the due dates. There will be incentives to turn in your assignment on time. I will apply a 25% penalty to assignment turned in after the deadline, for delays of at most 24 hours. As an extra chance your lowest problem set grade will be dropped.

Research Paper: The goal of this course is to train you to perform and interpret analyses of economic data. You are highly encouraged to form study groups of two. You will write a paper on a topic of interest to you, focusing on analysis of relevant data. You need to type your paper in LaTeX. You should submit your codes, results, figures,tables, analysis, and interpretation in roughly 10 pages. To make sure that you have found an appropriate topic and data set and provide some guidance we will use the week of class-time 11/02 for meetings to discuss your research topic. Class will be cancelled during this week to allow for group meetings during class time). The research paper is due on Tuesday, December 1st, by noon (12:00 pm). Each team will present their research paper for almost 15 minutes. In each group, partners should both present their work in roughly equal proportion. Each individual's presentation will account for 50% of his/her research paper grade.

Exams: There will be two quizzes and one midterm. Midterm and quizzes will be held in regular class hours. As an extra chance your lowest quiz grade will be dropped.

Group Discussions - Extra Credits: There will be a number of group discussions in this class. During the group discussion sessions you will be assigned a practice set. In a group of 2 or 3 you and your partner(s) may discuss with each other and share your screens to answer the questions. During the group discussions I will join your group and you can ask your questions. These group discussion sessions can offer you practice in critical thinking and problem solving and optimize your learning.

Grading Policy: There will be no make-up exams. If you miss your midterm, in the case of a legitimate emergency, I will give no weight to your midterm in the calculation of your final grade, and your two quizzes will be re-weighted proportionately.

Grade Disputes: If you believe an error occurred in the grading of an exam, quiz, or problem set, you must send your TA a detailed written request within 2 weeks of receiving the grade. The request should specifically mention which questions you believe were graded incorrectly and provide justification for why your answers deserved more credit. Such concerns will not be considered unless raised in a timely manner.

Grade	Percent
Problem Sets	24%
Quiz	16%
Midterm	30%
Final Research Project	30%
Group Discussions	Extra Credits 5%

Tentative Course Outline:

Tentative Schedule	Resource: Introductory Econometrics: A Modern Approach, by Jeffrey M. Wooldridge
Programming	R Tutorial
Introduction	The Nature of Econometrics and Data Analysis
Chapter 2 & R Programming Tutorial	The Simple Regression Model (Cross-Sectional Data, Simple Regression Model, Ordinary Least Squares Estimates, Fitted Values, Residuals, Goodness-of-Fit, Incorporating Nonlinearities in Simple Regression, The Interpretation of Linear Regression, Expected Values and Variances of the OLS Estimators, and Gauss-Markov Assumptions for Simple Regression Model).
Chapter 3 & R Programming Tutorial	Multiple Regression Analysis (The Model with k Independent Variables, Holding Other Things Constant, Interpretation of Ordinary Least Squares, OLS Fitted Values, Residuals, A Partialling Out Interpretation of Multiple Regression, Goodness-of-Fit, Including Irrelevant Variables in a Regression Model, Omitted Variable Bias, and Multicollinearity).
Chapter 4 & R Programming	Multiple Regression Analysis: Inference (Testing Hypotheses, the t Test, and p-Values).
Midterm Exam	10/21 and 10/23
Chapter 4 - Continued & R Programming	Multiple Regression Analysis: Inference (Confidence Intervals and the F Test).
Project Meetings	Week of 11/2 - 11/6
Chapter 6 & R Programming	Multiple Regression Analysis: Further Issues (Using Logarithmic Functional Forms, Models with Quadratics, Models with Interaction Terms, Adjusted R-Squared).
Chapter 7 & R Programming	Multiple Regression Analysis with Qualitative Information: Binary (Dummy) Variables (Describing Qualitative Information, A Single Dummy Independent Variable, Interpreting Coefficients on Dummy Explanatory Variables When the Dependent Variable Is log(y), Using Dummy Variables for Multiple Categories, Interactions Involving Dummy Variables, A Binary Dependent Variable, the Linear Probability Model, and Interpreting Regression Results with Discrete Dependent Variables).
Final Paper Due	12/01, by noon (12:00 pm).
Research Paper Presentations	12/02, 12/04, and 12/07.

University Policies:

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 of Conduct.

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.

Disability Accommodation: 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 under the Students tab on the Disability Services website.

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.

Honor Code : All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu; 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation: The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (including sexual assault, exploitation, harassment, dating or domestic violence, and stalking), discrimination, and 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 on the OIEC website. Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

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 campus policy regarding religious observances for full details.