Instructor: Dr. Sara Avila

Email: **sara.avila@colorado.edu**

Zoom: https://cuboulder.zoom.us/my/saraavila

- Office Hours: Tuesdays and Thursdays 9 am -11:30 pm using Zoom

INSTRUCTOR BIO

I am an economics instructor with more than two decades of experience. My research interests are in the fields of environmental economics and more recently, in how to teach economics. I have worked on topics related to air quality, climate change, urban transportation, and biodiversity conservation. I am passionate about building understanding in a diverse environment and I am an avid (also aging) runner. I am grateful to have the opportunity to share with you this learning experience.

Term Start: January 21, 2025

Term End: May 1, 2025

COURSE WEBSITE

Canvas is our class website:

- Login using your University of Colorado Boulder identikey and password
  https://canvas.colorado.edu/
- Under Course List, click "ECON 4818: Introduction to Econometrics"
- Note: all email correspondence will be through your CU Boulder email address.
    o Do not use the Canvas email or messages, it is not checked.

COURSE DESCRIPTION

This course provides an introduction to the theory and applications of modern econometrics. The course reviews hypothesis testing and mathematical expectations and then introduces the linear regression model.

Organized into fourteen modules, the course is divided into five parts. The first part reinforces the fundamentals of mathematics and probability theory. The second part introduces simple and multiple regressions. The third part overviews the main assumptions of linear regression models with emphasis in unbiasedness, asymptotics, and heteroskedasticity. The fourth part explores variable transformations. Finally, students are expected to apply their knowledge in a Final Paper.

This foundational course is essential to your success in the study of economics. The applications of the tools and skills learned in this course are to be applied to a myriad of areas: health, education, income distribution, sports management, urban planning, voting prediction, race issues, environmental conservation, climate change, just to name a few.

COURSE OBJECTIVES

By the end of the course, you should be able to:

1. Explain the assumptions of the simple and multiple linear regression model
2. Conduct econometric analysis of the linear regression model using statistical packages
3. Make and test inferences in the linear regression model
4. Formulate a novel but straightforward question and test it using real world data
5. Communicate the results of econometric analysis in a clear and professional way

COURSE PREREQUISITES

Requires prerequisite courses of ECON 3070 (Intermediate Microeconomic Theory) and ECON 3818 (Introduction to Statistics with Computer Applications) or STAT 4520 or APPM 4570 or CHEN 3010 or CSCI 3022 or CVEN 3227 or MATH 4520 (all minimum grade C-).

REQUIRED COURSE MATERIALS

Textbook (required): Introductory Econometrics: A modern approach, 7th Edition with Mindtap, by Jeffrey M. Wooldridge, Cengage Publishing, ISBN 978-1-337-55886-0.

You need the version with Mindtap. Mindtap is where you will read your textbook and complete some graded assignments. You may also buy a hard copy of the book, but this is not required.

Day 1 Digital Access: The CU Book Store and the publisher coordinated to deliver those materials through a program called "Day 1 Digital Access", which will appear on your tuition and fee bill as "Day 1 Digital Access".
What does this mean for you?

1. You will receive access to all your course materials, digitally, on the first day of classes, through the course Canvas page.
    - You will see a "Day 1 Digital Access" charge on your tuition and fee bill for about: **$117.00** This is a guaranteed low price, discounted by the publisher, and not available outside this course
2. You have the option to opt out. This means: you won't pay for anything, but you lose all access to the course materials.
    - You can opt out by: using a link in a reminder email you will receive with the subject heading "Day 1 Digital Access".

- You must opt out no later than January 30, otherwise you will be charged for the materials.
3. Please keep in mind that "opting out" means that your access to these materials will be turned OFF, and you will have no way to complete assignments.

You will access Mindtap through our course website, Canvas. For options and support see: https://www.cengage.com/coursepages/UC_Mindtap

SUPPLEMENTAL MATERIAL

You will use R, a free statistical package to conduct statistical analysis. You will get some basic training on how to install and do some basic operations in R. I will help you through the semester. An additional free resource is the book Modern R with the tidyverse by Bruno Rodrigues:

- https://b-rodrigues.github.io/modern_R/

INSTRUCTIONAL METHODOLOGY AND DELIVERY

This course is delivered via distance education format using the CU Canvas system. This format will use a combination of readings, online discussion, and other web-based resources. You will interact with the instructor and other students using the communication functions provided by Canvas. You will submit assignments in accordance with the course outline using Canvas. You will also have access to Mindtap from Cengage through Canvas.

COURSE PRESENTATION AND PROCEDURES

There will be 14 modules corresponding to the 14 weeks of the course (1 module per week). You should proceed through one module per week, which will be comprised of readings from the course texts, supplemental class notes, graded discussion questions, Homework, exercises, exams, and few outside sources of information such as additional readings and video content.

COURSE OUTLINE

Review the separate weekly class schedule found on Canvas under "Syllabus" link.

CLASS PARTICIPATION

This course is designed to engage you mostly through exercises, however, there will also be class discussions on the topics covered in the course materials. It is important that you participate in class discussions to facilitate learning by other students and gain exposure to different viewpoints of other students in the class.

EVALUATION AND GRADING

Course grades will be determined by the completion of assignments, exams, and discussions, as shown below:

	Points per assignment	Frequency	Grade Points	Grade Percentage
Exercises*	20	13	260	26%
Discussion Postings	25	4	100	10%
Homework*	20	10	200	20%
Final Project	150	1	150	15%
Proctored Midterm Exam	140	1	140	14%
Proctored Cumulative Final Exam	150	1	150	15%
TOTAL			**1000**	**100%**

Keep a copy of all work created for the course, including work submitted through Canvas.
*The lowest grade of these assignments will be dropped. See below.

COURSE GRADING CRITERIA

Grade	Percentage Grade	Equivalent Points	Indicates
A	94.1-100	941 – 1000	Excellent
A-	90-94	900 – 940	
B+	87-89.99	870 – 899	
B	83-86.99	830 – 869	Above Average
B-	80-82.99	800 – 829	
C+	77-79.99	770 – 799	
C	73-77.99	730 – 769	Average
C-	70-72.99	700 – 729	
D+	67-69.99	670 – 699	
D	63-67.99	630 – 669	Below Average
D-	60-62.99	600 – 629	
F	0-59	600 or lower	Failure

ASSIGNMENTS

Homework assignments (200 Points) – There will be eleven 20-point Homework assignments. The format will be multiple choice and/or fill in the blank and will be open book, open notes. Most Homework will be completed in Mindtap. Your lowest one (1) Homework assignment will be dropped from your final grade calculation.

Exercises (260 POINTS) – There will be fourteen 20-point exercises. The first three exercises do not require the use of a statistical package. Exercises in Modules 4-13 will be Computer Exercises through Mindtap. They will be a combination of multiple choice, numeric, and short answer/fill in the blank. They can be done in R (although you can use any statistical package to complete them) and will be open book and open notes. Except for the first three modules,

computer exercises will be completed in Mindtap. Your lowest one (1) Exercise will be dropped from your final grade calculation

Discussion postings (100 POINTS) – There will be four 25-point discussion postings. The discussion will occur asynchronously; I will post a discussion question and you will respond to the questions at your convenience prior to the due date. Discussions are open book and open note. Discussions will be submitted through Canvas. The initial discussion post is due Thursdays and the discussion response is due Sundays. AI-tools are absolutely forbidden in discussions.

Final-Project (150 POINTS) – There will be one individual final project. This assignment will be 3 pages in length, single spaced, 12 point font, 1" margins. This writing assignment as well as a short summary, will be submitted through Canvas. You will investigate your own hypothesis. This paper will encompass most of what we have learned in the class.

Exams (290 POINTS) – There will be two (2) exams. The proctored Midterm Exam is worth 140 points and the proctored cumulative Final Exam is worth 150 points. The format of the exam will be multiple choice and calculations and will be closed book. The exams are completed on Canvas or Mindtap in a proctored setting.

This course requires proctored examinations. Exams are proctored which will require planning on your part. Proctors are individuals who administer the exam process following the guidelines provided by University of Colorado Boulder to ensure academic integrity.

Who can be my proctor?
    If you are in Boulder or nearby, you can take your exam:
1. At the Department of Economics. There is no cost for using this proctor. This option is only on selected days during the exam period.
2. At the University Testing Center on-campus in Boulder, CO. There may be a cost for using the testing center. This option is only available M-F during regular business hours.
3. With Proctorio. Online proctoring is a service that uses a webcam and microphone to ensure academic integrity. To use this service, you must have access to a computer with a webcam and a microphone. There will be a cost for using the online proctoring services. Please review Proctorio Minimum System Requirements to ensure you have the correct hardware and software to use this tool.

    If you are outside of Boulder, you can take your exam:
1. At an accredited college or university testing center in your town or nearby. There may be a cost for using this testing center.
2. With Proctorio or a comparable online proctoring service as determined by your instructor. Online proctoring is a service that uses a webcam and microphone to ensure academic integrity. To use this service, you must have access to a

> computer with a webcam and a microphone. There will be a cost for using the online proctoring services.

- Note that you are required to have a computer with a functioning webcam and microphone or have access to a computer with a functioning webcam microphone to complete your exams.
- See Canvas for detailed information about proctoring. If you are in a rural area or on a military base, you may need approval process.

EXTRA CREDIT

There MAY be 30 points of extra credit available (= 3% of the course grade).

- Extra credit may be available during the semester for completing certain activities, such as listening and commenting on a podcast or solving practice exams. These extra credit opportunities will be determined by the instructor and announced on Canvas.

COMMUNICATION

I am nice and I want you to succeed. Do not hesitate to contact me about anything.

E-mail: sara.avila@colorado.edu

- **Please always remind me of what course you are taking.** I will remember your story and your face, but I forget which course you are taking.
- I will respond to email within 12-18 hours, but usually within 2-4 hours. I always respond to emails. If you have not had a response within 18 hours, I did not receive the email. Be sure to use your CU email address because sometimes Gmail and yahoo email accounts are filtered into my spam folder.

Additional ways to contact Dr. Avila:
- Online Office Hours: Tuesdays and Thursdays 9 am -11:30 am using Zoom (https://cuboulder.zoom.us/my/saraavila)
- Announcements: Please check the "announcements" section on Canvas.
- Use the "Place to Talk" discussion space

TUTORING

The Economics Department provides a free drop-in tutorial office which offers assistance on all core courses in the major, and occasionally on other undergraduate courses in the Department. Its website is https://www.colorado.edu/economics/node/513/attachment.

The Economics Department maintains a list of tutors who are available for private hire. Its website is https://www.colorado.edu/economics/node/515/attachment.

TECHNOLOGY SUPPORT

CU Boulder uses Canvas. Here is the list of recommended system requirements: Canvas Computer Specifications Page

Here is the detailed list of internet browsers in Windows, MacOS, iOS and Android: Supported Browsers Page

Technical Support

- Canvas technical support. If you are experiencing issues with Canvas please contact:
    - CU Boulder's Help desk at 303-735-4357 (5-HELP) or help@colorado.edu. 5-Help will answer your call: Monday through Friday from 7:30 a.m. to 7:00 p.m., Saturday and Sunday from noon to 6:00 p.m., Closed during University Holidays
    - On your computer, click the "help" (?) icon on the left side of Canvas, once logged in within the Canvas App, you can search the Canvas support guides, Report a Problem or chat with Canvas Support 24 hours a day, 7 days a week.
- Cengage tech support: https://help.cengage.com/mindtap/mt-student/common/contact-support.html

ACCEPTABLE USE OF AI IN THIS CLASS

The best use of AI tools like ChatGPT is as a guidance for solving doubts when coding in R. Be aware that the tutoring from AI may be inaccurate, incomplete or wrong.

You may not use AI-based tools to write your discussions. You may not use AI-based tools to write your Final Paper. You may not submit any work generated by AI as your own. If you include any material generated by an AI program, then please cite "ChatGPT (date) the text of your query." You must be transparent in how you used the AI tool. Ensure your use of AI-based tools does not violate any copyright or intellectual property laws. Lazy use of AI (cutting and pasting) will result in a zero.

POLICY ON DUE DATES
Each lecture you will complete Exercises, Homework, and sometimes discussion posts. It is your responsibility to turn in each assignment on the required date. Exercises or discussion postings turned in after the scheduled due date will be lowered to the next letter grade for each 12-hour period late. The exceptions that may be considered is due to sickness, university excused function, or circumstances beyond the students' control. The instructor reserves the sole right to determine what grounds constitutes a reasonable excuse for missing or submitting a late work assignment, the right to require the student to submit proper verification of such excuse.

COURSE WITHDRAWAL POLICY
Any student who wishes to withdraw from the course must submit a request directly to Continuing Education. For complete information, please visit their website at https://ce.colorado.edu/resources/topics/dates-and-deadlines-general-info/

NETIQUETTE
All students should be aware that their behavior impacts other people, even online. I hope that we will all strive to develop a positive and supportive environment and will be courteous to fellow students and your instructor. Due to the nature of the online environment, there are some things to remember.
1. Always think before you write. In other words, without the use of nonverbals with your message, your message can be misinterpreted. So please think twice before you hit submit.
2. Keep it relevant. There are places to chat and post for fun everyday stuff. Do not stray from the discussion in the assigned questions.
3. Never use all caps. This is the equivalent of yelling in the online world. It is not fun to read. Only use capital letters when appropriate.
4. Make sure that you are using appropriate grammar and structure. In other words, do not use "R U" instead of "are you". There are people in the class that may not understand this type of abbreviation, not to mention it does nothing to help expand your writing and vocabulary skills. Emoticons are fine as long as they are appropriate. A smile ☺ is welcome, anything offensive is not.
5. Treat people the same as you would face-to-face (or kinder). It might be easy to hide behind the computer. In some cases, it empowers people to treat others in ways they would not in person. Remember there is a person behind the name on your screen. Treat all with dignity and respect and you can expect that in return.

Website: http://www.albion.com/netiquette/corerules.html

Compiled by Melissa Landin, Instructor, Dept. of Communication, Inver Hills Community College, mlandin@inverhills.edu

ACCOMODATION FOR DISABILITIES, TEMPORARY MEDICAL CONDITIONS AND MEDICAL ISOLATION

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, see Temporary Medical Conditions on the Disability Services website.

Campus policy requires faculty to provide reasonable accommodations for students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Please communicate the need for a religious accommodation in a timely manner.

CLASSROOM BEHAVIOR

Students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote, or online. Failure 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, marital status, political affiliation, or political philosophy.

For more information, see the classroom behavior policy, the Student Code of Conduct, and the Office of Institutional Equity and Compliance

HONOR CODE

> "On my honor, as a University of Colorado Boulder student
> I have neither given nor received unauthorized assistance."

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the Honor Code may include but are not limited to: plagiarism (including use of paper writing services or technology [such as essay bots]), 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. Understanding the course's syllabus is a vital part in adhering to the Honor Code.

All incidents of academic misconduct will be reported to Student Conduct & Conflict Resolution: StudentConduct@colorado.edu. Students found responsible for violating the Honor Code will be assigned resolution outcomes from the Student Conduct & Conflict Resolution as well as be subject to academic sanctions from the faculty member. Visit Honor Code for more information on the academic integrity policy.

SEXUAL MISCONDUCT, DISCRIMINATION, HARRASSMENT AND/OR RELATED RETALIATION

CU Boulder is committed to fostering an inclusive and welcoming learning, working, and living environment. University policy prohibits protected-class discrimination and harassment, sexual misconduct (harassment, exploitation, and assault), intimate partner abuse (dating or domestic violence), stalking, and related retaliation by or against members of our community on- and off-campus. The Office of Institutional Equity and Compliance (OIEC) addresses these concerns, and individuals who have been subjected to misconduct can contact OIEC at 303-492-2127 or email cureport@colorado.edu. Information about university policies, reporting options, and support resources including confidential services can be found on the OIEC website.
Please know that faculty and graduate instructors must inform OIEC when they are made aware of incidents related to these policies regardless of when or where something occurred. This is to ensure that individuals impacted receive outreach from OIEC about resolution options and support resources. To learn more about reporting and support for a variety of concerns, visit the Don't Ignore It page.

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.

MENTAL HEALTH AND WELLNESS
The University of Colorado Boulder is committed to the well-being of all students. If you are struggling with personal stressors, mental health or substance use concerns that are impacting academic or daily life, please contact Counseling and Psychiatric Services (CAPS) located in C4C or call (303) 492-2277, 24/7.

Free and unlimited telehealth is also available through Academic Live Care. The Academic Live Care site also provides information about additional wellness services on campus that are available to students.

ADDITIONAL SUPPORT SERVICES
A variety of instructional support services, such as writing center, guidance on personal or educational issues, tutoring questions and library resources are available to the students. For more information about their services, visit their websites linked under modules on Canvas.

Introduction to Econometrics, ECON 4818, Spring 2025, Avila, University of Colorado Boulder

Module (start date)	Chapter Number and Topic	Graded Assignments	Due Date by *11:59pm MST/MDT*
1 (1/21)	Appendix A: Mathematical Tools	Discussion post Assignment Module 1 Discussion comment Homework Module 1	Thursday 1/23 Thursday 1/23 Sunday 1/26 Sunday 1/26
2 (1/27)	Appendix B: Fundamentals of Probability	Homework Module 2 Exercise Module 2	Thursday 1/30 Sunday 2/2
3 (2/3)	Appendix C: Fundamentals of Mathematical Statistics	Homework Module 3 Exercise Module 3	Thursday 2/6 Sunday 2/9
4 (2/10)	1 What is Econometrics	Homework Module 4 Computer Exercise Module 4	Thursday 2/13 Sunday 2/16
5 (2/17)	2 The Simple Regression Model	Homework Module 5 Discussion post Computer Exercise Module 5 Discussion comment	Thursday 2/20 Thursday 2/20 Sunday 2/23 Sunday 2/23
6 (2/24)	3 Multiple Regression Estimation	Homework Module 6 Computer Exercise Module 6	Thursday 2/27 Sunday 3/2
7 (3/3)	You may take the proctored midterm exam the day of your choosing Thursday through Sunday**.**	**Proctored Midterm Exam**	**Thursday 3/6-Sunday 3/9**
8 (3/10)	4 Multiple Regression Analysis	Homework Module 8 Computer Exercise 1 Module 8 Computer Exercise 2 Module 8	Thursday 3/13 Sunday 3/16 Sunday 3/16
9 (3/17)	5 Multiple Regression Analysis: Asymptotics	Homework Module 9 Discussion post Computer Exercise Module 9 Discussion comment	Friday 3/20 Friday 3/20 Sunday 3/23 Sunday 3/23
10 (3/31)	6 Multiple Regression Analysis: Further Issues	Homework Module 10 Computer Exercise 1 Module 10 Computer Exercise 2 Module 10	Thursday 4/3 Sunday 4/6 Sunday 4/6
11 (4/7)	7 Multiple Regression Analysis: Analysis with Qualitative Variables	Homework Module 11 Computer Exercise 1 Module 11 Computer Exercise 2 Module 11	Thursday 4/10 Sunday 4/13 Sunday 4/13
12 (4/14)	8 Heteroskedasticity	Homework Module 12 Computer Exercise 1 Module 12 Computer Exercise 2 Module 12	Friday 4/17 Tuesday 4/20 Tuesday 4/20
13 (4/21)	Semester Mini Project	Discussion Post Discussion Comment Project Due	Tuesday 4/22 Thursday 4/24 Sunday 4/27
14 (4/28)	You may take the proctored cumulative final exam the day of your choosing Thursday through Sunday	**Proctored Final Exam**	**Thursday 5/1-Sunday 5/4**