

UNIVERSITY OF COLORADO AT BOULDER - DEPARTMENT OF ECONOMICS
ECON 4818 - INTRODUCTION TO ECONOMETRICS
PROFESSOR CARLOS BRUNET MARTINS-FILHO
FALL 2025

Office. Economics Building 105.

Meetings. TR 12:30 PM - 1:45 PM at ECON 119.

Office hours. TR 3:30 PM - 4:30 PM. If you need an appointment outside these hours send an email to carlos.martins@colorado.edu and I will try to accommodate your request.

Prerequisites. ECON 3070 and ECON 3818 or one of the following approved statistics substitutes: APPM 4570, CHEN 3010, CSCI 3022, CVEN 3227, MATH 3510, MATH 4520, STAT 3100, STAT 4000, STAT 4520 (all minimum grade C-).

Class URL. <http://spot.colorado.edu/~martinsc/4818.html>.

Course description and objectives. This course has two main objectives: 1) introduce you to estimation and testing for the multivariate linear regression (MLR) model under classical assumptions; 2) consider the estimation and testing of the MLR model when some of these classical assumptions are violated. Our emphasis will be on the theoretical aspects of estimation and testing with a secondary interest on applications and empirical questions.

Grades. Your course grade will be determined by two midterms and a final examination. I will assign homework questions. Answering these homework questions correctly is critical for successful performance on the midterms and final examinations. The homework questions will not be graded, but answers will be provided. The homework sets and answers will be posted on the class website given above. The table below lists all evaluations, provides dates, and points.

Evaluation	Points	Date and time
midterm 1	30 points	9.23, in class
midterm 2	30 points	10.28, in class
final	40 points	12.9, in class, 4:30 PM - 7:00 PM

Note. There are no make-up exams. If you miss one of the midterms, your grade on the final exam will be worth 70 percent of your course grade. If you miss both midterms, your grade on the final exam will be worth 100 percent of your course grade.

Observations. Some class meetings will be devoted to the implementation of the estimation and testing procedures we discuss in class. This will involve the use of a numerical/statistical software. The software we will use is called MATLAB. It is available at various computer laboratories on campus. MATLAB is easy to learn and is extensively documented.

Textbook.

Wooldridge, J., 2018, *Introductory econometrics: a modern approach, 7th edition*. South-Western Cengage Learning, OH.

Topics and Readings.

The Math Refresher A - Basic Mathematical Tools in the textbook is pre-requisite knowledge for this course. Study and/or refresh your knowledge of its content.

All readings, chapters and sections are from the textbook. It is also important to take good notes in class. Some of what I write on the blackboard will not be in the book.

1. The nature of econometrics and economic data: chapter 1, handout called "Introduction - Econ 4818" and Math Refresher A.
2. Math Refresher B - Fundamentals of Probability
3. Math Refresher C - Fundamentals of Mathematical Statistics
4. The simple linear regression model and the least squares estimator: chapter 2.
5. Advanced Treatment D - Summary of matrix algebra
6. Multiple linear regression (MLR) model and the least squares estimator: chapter 3 and Advanced Treatment E - The linear regression model in matrix form
7. Hypothesis testing for the MLR model under normality: chapter 4.
8. Asymptotic properties of the least squares estimator and Hypothesis testing for the MLR model under non-normality: chapter 5.
9. Data scaling, dealing with data transformations, regressor selection, goodness-of-fit and prediction: chapter 6.
10. Regression with binary variables: chapter 7.
11. Accounting for heteroscedasticity: chapter 8.
12. Functional form misspecification, regressor misspecification, measurement error: chapter 9, sections 9.1-9.4.
13. Instrumental variable estimation: chapter 15.

Important information.

- 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 policies at www.colorado.edu/policies/classbehavior.html and at www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code.

- Accommodation 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. If you have a temporary illness, injury or required medical isolation for which you require adjustment, please send me an e-mail.

- 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 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, harassment 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.

- Religious Accommodations

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 via e-mail.

See the campus policy regarding religious observances for full details.

www.colorado.edu/policies/fac_relig.html.