

ECON 4650: PRINCIPLES OF ECONOMETRICS

Fall 2023

Instructor: Colby Daniel Young	Time: Tu/Th, 12:25 p.m. — 1:45 p.m.
Email: Colby.d.young@utah.edu	Place: GC 3700

Contact Information:

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Consultation hours: Before or after class, or by appointment

Prerequisites:

'C-' or better in ((ECON 3640 OR OIS 3440) OR "B" or better in (MATH 1070 OR OIS 2340 OR BCOR 2030) OR AP Statistics score of 3 or better).

Course Description and Objectives:

This course introduces students to data analysis from the lens of an economist. The course delves into regression analysis, inference, causal analysis methods, and forecasting. The course places emphasis on doing data analysis using statistical software, but the course covers foundational econometric theory that would help the students to explore more advanced topics.

Primary References:

Personally, I do not follow a single reference. Students may choose to use any of the reference listed below to consult whenever needed. Weekly lecture notes will be the primary source of written content, and students are recommended to have at hand at least one book to consult, in order to complement the class notes.

- A.H. Studenmund, *Using Econometrics: A Practical Guide (7/e)*, 7th edition, Pearson, 2021.
 - This reference is available through inclusive access. Check out the Bookshelf tab on Canvas.
- J. H. Stock and M.W. Watson, *Introduction to Econometrics*, Pearson, 2015.
- J. M. Wooldridge, *Introductory Econometrics: a modern approach*, 4th edition, Cengage, 2009.
- D. N. Gujarati, *Basic Econometrics*, 4th edition, McGraw-Hill, 2004.
- C. Hanck, M. Arnold, A. Gerber, and M. Schmelzer, *Introduction to Econometrics with R*.
 - Available at: <https://www.econometrics-with-r.org/>.

Students are also encouraged to keep up with current economic news. *The Financial Times*, *The New York Times* and *The Wall Street Journal* are excellent sources and they are free on campus. You may also want to peruse *The Economist*. Additionally, an excellent website where you can find op-ed pieces by leading economists is *Project Syndicate*.

Software Requirements:

Our classes will always have theoretical and applied components. The latter will be done using R, an open-source and completely free statistical/programming language. Since this course is very applied in nature, we will learn Econometrics by doing Econometrics and thus by learning to use R. Within each of the class modules, the commands needed to complete the assignment are included in lectures and documents. I recommend to use R through RStudio Studio IDE (Integrated Development Environment). However, students are welcome to use the platform they prefer (i.e., Command prompt).

In addition, having a spreadsheet editor (e.g., Excel) is strongly recommended. University of Utah students should have free access to Microsoft Office programs through Office 365.

No previous knowledge in R is required. The course will guide students through every step in the applied lectures.

- Download R: <https://cloud.r-project.org/>
- Download R Studio: <https://rstudio.com/products/rstudio/>

Assignments, Exams, and Grading:

- Assignments (30%): Every week, students are required to complete a quiz (True/False, multiple-choice questions), comprehending each weekly content. Each weekly quiz is due the beginning of Tuesday classes (12:25PM). Students will also be required to complete 5 short Problem Sets, that will comprehend, in general, 2-3 weeks of content. Students will be asked to answer theoretical and applied problems, strongly based off of lecture notes and live video classes. Lastly, we will have 5 Lab Practices, where students will explore and exercise new R libraries, which will be useful throughout the semester. Problem Sets and Lab Practices will be due on Sunday's at 11:59 P.M.
- Exams: This class will have a Midterm (20%) and a Final (comprehensive, 30%) exam. Each exam will be worth 40 points, following a similar structure as the Problem Sets'. Students will have 3 days to complete each exam, uploading an R script with the necessary code and interpretations.
 - Midterm Exam: Due October 8th
 - Final Exam: Due December 15th
- Research Project (20%): The idea of the applied project is to provide a hands-on experience to students, in which she is responsible for formulating a research question, looking for the data (either cross-section or time-series), and performing the appropriate econometric treatments and techniques, so, by the end of it, that question can be answered. The project must be between 8 and 10 pages, double-spaced, with the required econometric outputs and bibliography. All necessary assistance will be provided by the instructor upon students' requests. Moreover, students will have access to a template, as well as several projects shared by students from previous semesters, serving as useful references. Feel free to work either in pairs or individually.
 - Due December 10th

Important note 1: For any assignment, if an answer contains a direct "Copy+Paste" from the lecture notes, or if it is copied from someone else's work, no credit will be given. Read more in the Academic Dishonesty section, on page 5.

Important note 2: All assignments, except quizzes and Final, will be due on Sundays. Any late submissions will receive no credit.

Grading system follows the university standards:

- Excellent, superior performance: A (93-100%), A- (90-92.9%)
- Good performance: B+ (87-89.9%), B (83-86.9%), B- (80-82.9%)
- Standard performance: C+ (77-79.9%), C (73-76.9%), C- (70-72.9%)
- Substandard performance: D+ (67-69.9%), D (63-66.9%), D- (60-62.9%)
- Unsatisfactory performance: E (0-59.9%)

Class Policies:

You can expect me to:

- Grade and provide feedback on assignments and exams within one week from the due date;
- Reply to emails/messages within 24 hours during the week and within 48 hours on weekends and holidays;
- Hold weekly office hours, where students can ask every question and talk about any issues/ concerns relative to our class.

I expect students to:

- Come to class in time;
- Check out Announcements and new content updates as soon as possible;
- Take the exams on the scheduled dates. Make up exams will only be allowed under certain circumstances;
- Respectfully participate in in-class discussions and activities;
- Immediately notify me in the event of an emergency that prevents you from doing an exam or completing the course;
- Ask questions if any expectations or assignments are unclear.

Tentative Course Schedule:

The following outline is approximate. We may slow down or speed up in accordance with the needs and demands of the class.

- **Week 1:** Course introduction, Stats refresher, introduction to R and RStudio.
- **Week 2:** Simple Linear Regression.
- **Week 3:** Multiple Regression.
- **Week 4:** The Classical Linear Regression Model (CLRM).
- **Week 5:** Econometric Inference.
- **Week 6:** More on Functional Forms.
- **Week 7:** Violations of CLRM Assumptions I: Omitted Variables Bias (OVB).
- **Week 8:** Violations of CLRM Assumptions II: Multicollinearity
- **Week 9:** Violations of CLRM Assumptions III: Serial Correlation.
- **Week 10:** Violations of CLRM Assumptions IV: Heteroskedasticity.
- **Week 11:** Binary Dependent Variable Models.
- **Week 12:** More on Time-Series Data.
- **Week 13:** Introduction to Panel Data.
- **Week 14:** Open for adjustments.
- **Week 15:** Course Wrap-up and Review.

Important Dates

- **Classes begin:** Monday, August 21st
- **Last day to add/drop classes:** Friday, September 1st
- **Midterm Exam:** Due October 8th
- **Fall Break:** October 8th-15th
- **Last day to withdraw from classes:** Friday, October 20th
- **Thanksgiving Break:** November 23rd-26th
- **Research Project Due:** December 10th
- **Final Exam:** Due December 15th

University Policies:

1. **The Americans with Disabilities Act:** The Department of Economics at the University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services (162 A. Ray Olpin Student Union Building, 581-5020 (V/TDD)) to make arrangements for accommodations (more information can be found [here](#)). All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.
2. **University Safety:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. More information regarding safety and to view available training resources (including helpful videos) can be found [here](#).
3. **Addressing Sexual Misconduct:** Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801—581—8365, or the Office of the Dean of Students, 270 Union Building, 801—581—7066. For support and confidential consultation, contact the Center for Student Wellness, SSB 328, 801—581—7776. To report to the police, contact the Department of Public Safety, 801—585—2677(COPS).
4. **Undocumented Student Support:** Immigration is a complex phenomenon with broad impact—those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit the [Dream Center website](#).

5. **Wellness Statement:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a students ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness: www.wellness.utah.edu, 801-581-7776.
6. **Student Names & Personal Pronouns:** Class rosters are provided to the instructor with the students legal name as well as “Preferred first name” (if previously entered by you in the student profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected.
7. **Diversity/Inclusivity:** I stand in support of compassion, dignity, value-of-life, equity, inclusion and justice for all individuals regardless of color, race/ethnicity, sexual orientation, religion, language, socioeconomic status, ability, gender, gender identity or expression, immigration status, or any type of marginalization. I stand in support of making our society more inclusive, just, and equitable for all individuals. I stand against individual and systemic racism in all its various forms.