ECON 11020-02: Introduction to Econometrics

Oscar Galvez-Soriano

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Class Hours: TuTh 8:00-9:20am
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Course Description

The objective of this course is to introduce students to the practice of econometrics. The course will focus on the use of multiple regression to describe/predict real world data and, under certain conditions, as a tool to establish causal relations. The course emphasizes all steps of the process of empirical research: data collection, analysis, and presentation (both written and oral). Multiple examples of this process will be discussed, and students will be expected to read and evaluate existing research. Students will apply the techniques discussed in class to a topic of their choosing. They will write a paper and present results to the class.

Required Materials

I have set up a Canvas course website that contains our textbook ("Piece of Cake" by Pablo Peña), lecture notes, problem sets, and other learning resources.

The following textbooks are not required, but serve as a complement for this class:

- Stock, James H. and Watson, Mark W. (2020). Introduction to Econometrics (Fourth Edition). Pearson.
- Gertler, Paul J., Martinez, Sebastian, Premand, Patrick, Rawlings, Laura B., Vermeersch, Christel M. J. (2016). Impact Evaluation in Practice (Second Edition). Washington, DC: Inter-American Development Bank and World Bank. http://hdl.handle.net/10986/25030

For further references, you may also review the following textbooks:

- Jeffrey M. Wooldridge (2015). Introductory Econometrics: A Modern Approach (Sixth Edition). Cengage Learning.
- Joshua D. Angrist and Jorn-Steffen Pischke (2009). Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.
- Joshua D. Angrist and Jorn-Steffen Pischke (2015). Mastering 'Metrics: The Path from Cause to Effect. Princeton University Press.

Prerequisites

In order to register for this course all students should have completed Econ 10000, Econ 10200, and either Econ 11010/21010 or STAT 22000/23400/24400/24410. Additionally, you must have a good command of high school Algebra, graphical analysis and, preferably, basic knowledge of Calculus. If you do not meet these prerequisites and you choose to take this course, then it is your responsibility to work on your math skills in order to be able to follow the materials taught in this course.

Requirements and Grading

Each student's cumulative score for this course will be based on performance on problem sets and exams, and the class paper with the weights given in the grading scheme below. This cumulative score will then be mapped into a letter grade at the end of the course.

1. Problem sets: four problem sets, with the lowest score dropped (**25%**)
2. Midterm exam. Tuesday, October 31 (**25%**)
3. Paper and presentation, due on Tuesday, November 28 (**20%**)
4. Final exam. Tuesday, December 5, 7:30-9:30am (**30%**)

All grades are final except for correcting obvious grading mistakes. For example, points are added up incorrectly, or obviously correct answers are mistakenly marked wrong. Please bring these to the teaching assistant's attention as soon as possible. For other cases, please discuss questions with the teaching assistant or me.

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Cum. Score	95	90	85	80	75	70	65	60	55	50	<50

Any student scoring higher than the cutoff given above will earn at least that grade in the course. You may request Pass/Fail grading no later than Monday, December 4 at 5PM CT. If you wish to withdraw from the course without a W on your transcript you must do so before Friday, October 13 at 5PM CT. A withdrawal after this date but before Monday, November 27 at 5PM will result in a W grade on your transcript. A withdrawal may not be granted after this time except in extenuating circumstances, and you must submit a petition to withdraw with your academic advisor. You cannot switch back to a letter grade after withdrawing or opting for Pass/Fail, so you should discuss the ramifications with your academic advisor before requesting either.

Problem Sets: Problem sets will be assigned in class, every Tuesday, and should be submitted the following week during the discussion section directly to the TA. Solutions to graded problem sets will be available one week after submission at the beginning of the discussion section. You should examine the solutions to review any areas of confusion or questions marked incorrect. Note I cannot give deadline extensions for the problem sets; however, I do drop the lowest problem set grade, which gives you some flexibility in handling unexpected events. Assignments that require coding should include as part of the submission a printout of the code used to generate output required for problem set questions. Students will need to develop basic familiarity with Stata, which will be covered in class and in discussion sections. Students may use vLAB to access university software. Off-Campus use requires cVPN.

Exams: Exams will draw on material from lectures, problem sets and the textbook. You will have 60 minutes to complete each exam. Both exams will take place in person. No book, notes, phone or internet access of any kind is allowed during the exam. Examinations are to be attempted individually. No communication with others about any aspect of the course is permitted during the exam. No part of the examinations may be copied, shared, posted on a website or otherwise distributed at any time. Any student who violates these examination policies will fail the course and be referred to the Dean of Students.

If you have a reasonable excuse to miss the midterm, you need permission from me before its scheduled time to miss it, otherwise you will receive a zero for the midterm. If granted permission to miss it, your final exam's score will substitute the score for your missed midterm.

If you miss the final with an excuse that meets University standards you will receive an incomplete for the course and will be required to resolve it in the upcoming quarters in order to receive a letter grade. Please note that travel plans are not an approved excuse for missing an exam. If you make travel plans that conflict with the final for any reason other than a university approved excuse, you will receive a zero for the final.

Class Paper: Students will work in groups of four to write a paper using data and a prompt I will provide later on in the course. Students will tackle a relevant economic question and should use methods developed during the course to answer this question and give a detailed explanation of their findings. In addition, each group will give a ten-minute, five-slides presentation of their results. This class paper is worth 20% of your grade, from which 15% will come from the written paper and 5% from the presentation itself.

While grading the paper, I expect to see the following: "Introduction", including the background and the research question (maximum one page); "Data", including only relevant descriptive statistics in form of tables and/or graphs (maximum one and a half pages); "Empirical Strategy", which must include your main equation(s), a description of your equation(s), and an explanation of your identification strategy and assumptions (all this in maximum one page); "Results and Conclusions", including tables and/or graphs (maximum two pages). The two first sections will be worth 5% and the last two sections 10% of your grade.

Attendance: Students are expected to attend every lecture and participate in lecture activities. Note that the lectures contain the material you are expected to know, and the textbook is not a perfect substitute for the lectures.

General Policies

Our Class Meetings

We will meet every Tuesday and Thursday between September 26 and November 30. We may schedule a one hour review session during the reading period (Saturday-Monday, December 2-4) as preparation for your final exam. Lectures will begin at 8:00am and end at 9:20am.

Academic Honesty

To cultivate an environment of academic integrity, the University of Chicago expects students to abide by the University's Academic Honesty and Plagiarism Policy, found in the University of Chicago Student Manual.

Student Code of Conduct

Students are expected to abide by the University of Chicago's Student Code of Conduct.

Sexual Misconduct Policy

In accordance with the University of Chicago's Policy on Harassment, Discrimination, and Sexual Misconduct, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office. Please know there are places on campus where you can make a report in confidence. More information can be found on the Title IX website.

Special Accommodations and Accessibility

The University of Chicago is committed to ensuring equitable access to our academic programs and services. Students with disabilities who have been approved for the use of academic accommodations by Student Disability Services (SDS) and need a reasonable accommodations) to participate fully in this course should follow the procedures established by SDS for using accommodations. Timely notifications are required in order to ensure that your accommodations can be implemented. Please meet with me to discuss your access needs in this class after you have completed the SDS procedures for requesting accommodations.

Phone: (773) 702-6000
Email: `disabilities@uchicago.edu`

For exam accommodations, it is recommended that students send their Instructor Notification Letters at the beginning of the quarter, or as soon as possible. Instructor Notification Letters must be sent no later than 7 days prior to the first quiz/exam date for the class for each class for which a student is seeking to use accommodations.

We will request that SDS proctor the Econ 11020 exams. Students must submit an exam request/schedule through the SDS Portal at least 7 days prior to an exam date. These steps should be followed for each exam. One option that students may utilize is submitting the exam requests for all known exam dates early in the quarter and may be done in one sitting if the dates are available in the syllabi. Currently, SDS may be unable to make arrangements for exam requests submitted less than 7 days in advance of an exam date. Remote Exams are not available.

To submit an exam request, students should complete the following steps after they have sent their Instructor Notification Letter:

1. Log in to the AIM Student Portal (https://rainier.accessiblelearning.com/UChicago)
2. Select "Alternative Testing" on the left-hand side of the page.
3. Select the course for which you are scheduling with SDS from the drop-down menu at the top of the page.
4. Click "Schedule an Exam".
5. Complete the required fields on the exam detail form.
6. Click "Add Exam Request".
7. Students will receive a confirmation e-mail to verify that their exam request was received and may check the status of their request in their AIM Student Portal. SDS may proctor in-person exams at locations across campus and the locations will be listed in the status update in AIM. Locations are determined by SDS and may include Ida Noyes Hall, David Rubenstein Forum, and other campus locations.

Diversity and Inclusion

The University of Chicago believes that a culture of rigorous inquiry demands an environment where diverse perspectives, experiences, individuals, and ideas inform intellectual exchange and engagement. I concur with that commitment and expect to maintain a productive learning environment based upon open communication, mutual respect, and nondiscrimination. The University does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national or ethnic origin, age, status as an individual with a disability, protected veteran status, genetic information, or other protected classes as required by law.

Use of AI Tools

In this course, we will be developing skills and knowledge that are important to discover and practice on your own. Because use of AI tools inhibits development of these skills and knowledge, students are not allowed to use any AI tools, such as ChatGPT or Dall E 2, in this course. Students are expected to present work that is their own without assistance from others, including automated tools. If you are unclear if something is an AI tool, please check with your instructor. Using AI tools for any purposes in this course will violate the University's academic integrity policy.

Syllabus Changes

Notice that I may need to adjust the syllabus, depending on our progress in the course. In such case, I will notify you about these changes during the lectures and through our Canvas website.

Course Outline and Schedule

The following schedule is tentative and subject to minor changes.

Week	Date	Lecture	Topics	Textbook pages	PS/Paper due
1	9/26	1	Introduction; Statistics Review	1-4	
	9/28	2	Simple Linear Regression	5-6	
2	10/3	3	OLS and Multivariate Regression	7-9	
	10/5	4	Assumptions, Properties and Inference	10-11	
3	10/10	5	Normality and Statistical Inference	11-12, 24-37	PS1 (10/9)
	10/12	6	Inference, Interpretation ans Specification	37-41	
4	10/17	7	Specification and Hypothesis Testing	13-23	PS2 (10/16)
	10/19	8	Specification Issues	42-53	
5	10/24	9	Rubin Causal Model; RCTs	54-59, 66-70	PS3 (10/23)
	10/26	10	RCTs; Panel Data; Fixed Effects		
6	10/31	11	**Midterm**		
	11/2	12	Difference in Differences (DiD)	74-79	
7	11/7	13	Parallel Trend Assumption		
	11/9	14	Regression Discontinuity Design (RDD)	70-73	
8	11/14	15	STATA; Empirical Project		PS4 (11/13)
	11/16	16	STATA; Empirical Project		
9	11/21		**Thanksgiving**		
	11/23		**Break**		
10	11/28	17	Presentations		Paper
	11/30	18	Presentations		
11	12/4		Review		
	12/5	Final	**Final Exam (7:30-9:30am)**		