Carleton University – Department of Economics

Winter 2024

ECON 5027: Econometrics I

The Instructor

Instructor: Clément Yélou, Contract instructor

Email Address: clement.yelou@carleton.ca

Office Location: TBA

Office Hours: Monday 6:00 pm - 7:30 pm EST

The Course

Course Location: Log into Carleton Central to view the class location on your personal timetable.

Course Day and Time : Thursday 6:05 pm - 8:55 pm EST

TA: Eric Jamieson

TA Email Address: Ericjamieson@cmail.carleton.ca

TA Office Location: Paterson Hall Room 115

TA Office Hours: Wednesday 7:35 pm - 8:55 pm EST

Brightspace Course Page: ECON 5027 Econometrics I Winter 2024 Brightspace.

Course Description: The goal of this course is to provide students with the technical background required to responsibly use a variety of common econometric methods. The focus of the course is primarily theoretical, although students will apply the material learned in class to analyze data and conduct simulation studies in the assignments.

The course will cover both linear and non-linear models. Introductory concepts related to simple and multi-

ple regression models are assumed to be known; however, it is not assumed that these concepts are known in a matrix algebra context. The course will introduce fundamentals of econometric theory underlying ordinary least squares before studying instrumental variables estimation method and maximum likelihood estimation method with illustrations with discrete choice models.

Course Preclusions: Precludes additional credit for ECON 5005 (no longer offered).

Course Prerequisites: None (MA status).

Programming Requirements

Students will be required to use R for the assignments. Programming in R will be taught in tutorials. R is open-source and freely available. Students may also find it useful to install Rstudio. Instructions on how to install R and RStudio will be posted on the course website before the first tutorial session. These programs should be installed before the first tutorial.

Tutorials

Tutorials will be given by the teaching assistant, starting January 24, 2024. The first tutorials will provide an introduction to programming using R, which will be used substantially throughout the course. After introducing the basics of programming in R, the tutorials will use R to explore simulation experiments in econometrics with applications to estimator's properties taught in class.

Course Calendar

The tentative course outline is displayed in Table 1. Depending on the pace of the lectures, this course outline may be subject to modification. Any changes will be discussed in advance in class.

Textbooks and Readings

Although we will use a variety of references in this course, our main reference (not required) will be:

- **(W)** Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data.* MIT Press.

Other references that may be useful throughout the course include:

- Angrist, J. D. and Pischke, J. (2008). *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton University Press.

Topic #	Lecture Dates	Topic	Readings
1	January 11 January 18	Introduction, Math Review, Linear Models	**(W)**: Ch. 3.
2	January 25 February 1 February 8 February 15	Properties of OLS	**(W)**: Ch. 4.
—	February 19 - February 23	Winter Break: no classes	
—	February 29	Midterm Exam	
3	March 7 March 14	Misspecification and IV Methods	**(W)**: Ch. 4.
4	March 21 March 28 April 4	Maximum Likelihood and Discrete Choice Models	**(W)**: Ch. 13, 15.

Table 1: A tentative course outline for ECON 5027.

- Anton, H., and Rorres, C. (2013). *Elementary linear algebra: applications version.* John Wiley & Sons.
- Cameron, A. C. and Trivedi P. K. (2005). *Microeconometrics: Methods and Applications.* Cambridge University Press.
- Davidson, R., and MacKinnon, J. G. (1993). *Estimation and inference in econometrics.* Oxford University Press.
- Davidson, R., and MacKinnon, J. G. (2004). *Econometric theory and methods.* New York: Oxford University Press.
- Hayashi, F. (2000). *Econometrics.* Princeton University Press.
- Train, K. (2009). *Discrete Choice Methods with Simulation.* Cambridge University Press.
- White (1984). *Asymptotic Theory for Econometricians.* Academic Press.

Evaluation

- Assignment I — 15%. To be posted on the course website on January 25, 2024. Due on February 15, 2024, at 11:59 pm EST. To be submitted via the course website.
- Midterm — 30%. The midterm will take place in class on February 29, 2024.

- Assignment II — 15%. To be posted on the course website on March 14, 2024. Due on April 4, 2024, at 11:59 pm EST. To be submitted via the course website.
- Final Exam— 40%. The final exam will be administered during the exam period, sometime between April 13 - 25, 2024. The final exam will be scheduled later in the term and more details will be released at that time.

Assignments

Students will submit assignment work individually. They may collaborate with each other while working on the assignment questions for learning purposes; however each student will have to prepare and submit his own assigmnment work.
Assignments will require students to apply programming skills learned in tutorials to a mix of theoretical and applied questions.
All assignments will be submitted via the course Brightspace page. Students will submit both a written portion of the assignment (containing any mathematical derivations or explanations required to answer the assignment questions), as well as meticulously labelled R code used to answer any of the programming-based questions.
Assignment marks may be deducted if any supporting code is not clearly labelled and/or explained.

Late assignments will be penalized 1 mark for each block of 5 minutes they are late (e.g. 23 minutes late means a 5 mark deduction from your total assignment score).

For any assessment question of the course and specifically for all assignment questions, any use of Generative Artificial Intelligence tools (e.g. ChatGPT) to produce assessed content is considered a violation of academic integrity standards as per the Carleton University's Statement on Plagiarism.

Midterm Exam and Policies

The midterm will be administered in class on February 29, 2024, and will cover lecture material up to and including the lecture on February 15, 2024.

If you are absent for a midterm, email me as soon as possible to reschedule. I reserve the right to request a Self-Declaration form or PMC letter of accommodation depending on the length of incapacitation.

Final Exam and Policies

The final exam will be administered during the final exam period from April 13 - 25, 2024. The final exam will cover lecture material up to and including the final lecture on April 4, 2024.

The final exam will be in person. It will be scheduled later in the term, and relevant details for the final exam, including the location, will be announced at that time.

Students are not to make travel plans during the exam period as that is not a valid reason for missing a final exam.

For those unable to complete the final exam in the scheduled time, documentation is required, e.g. doctor's note or police report. The documentation provided by students for missed or incomplete final exams will be subject to verification by the instructor. Submitting a forged note will be regarded as a serious academic offense. Students who miss the final exam and fail to provide sufficient documentation will receive a score of zero.

Satisfactory Performance Criteria

Students must fulfill all of the course requirements, including the final exam, in order to achieve a passing grade (D- or higher).

Deferred Final

Students who do not write the final examination because of illness or other circumstances beyond their control may apply for to write a deferred final examination by contacting the Registrar's Office no later than three working days after the original final examination was scheduled.

Any deferred examination will be in person, and relevant details for the deferred examination, including the location, will be communicated in due time to the student(s) writing the exam.

In the event that a student writes a deferred examination, the deferred examination will carry the same weight as the final examination in determining the course grade. begingroup.

E-Proctoring

E-proctoring will not be used for evaluations in this course.

Course Standing

Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

Important Dates and Communication

Important Dates

Table 2 displays a list of important dates. The evaluation dates below are subject to change.

Dates	Event
January 11	First Class
January 17	First Tutorial
January 25	Assignment I Posted
February 15	Assignment I Due at 11:59 pm EST
February 19 - 23	Winter Break, no classes.
February 29	Midterm (in class)
March 14	Assignment II Posted
April 4	Assignment II Due at 11:59 pm EST
April 4	Last Class
April 13 - 25	Final Exam Period

Table 2: Important dates for ECON 5027.

Email Communication

Communication outside of class, tutorials and office hours will be done through email. **For security purposes, please communicate only using your carleton.ca email address.** Please include the course name "ECON 5027" in the subject line of your email.

You can expect to receive a response to your email within 48 hours. However, communication outside of class hours should occur only in exceptional cases; while email is not the appropriate medium to ask questions about course material, students are allowed to use it. Students who request clarification on course material through email will either receive an answer or be directed to ask their question during class, tutorial or office hours, depending on the nature of the question.

Plagiarism, Resources and Mental Health, Academic Accommodations

Academic Misconduct and Plagiarism

Please be aware that plagiarism is serious offence. For information on policies surrounding academic misconduct, visit the following link to Carleton University Academic Integrity Policy. For information on how to avoid academic misconduct, visit the following link to Academic Integrity and Offenses of Conduct.

Copyright of Course Materials

The lectures and course materials (including all slides, exams, tutorial materials, and other similar materials) are protected by copyright. The course instructor is the exclusive owner of the copyright and intellectual property of all course materials. You may take notes and make copies of course materials for your own educational use. You may not reproduce or distribute lecture notes, videos, or other course materials publicly without the express written consent of the instructor.

Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, you may learn about the processes as stated on the Academic Accommodations website.