



**Carleton  
University**

Department  
of Economics

Fall 2023

ECON 4706 C Econometrics I

Course Outline

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Brightspace Course Page: <https://brightspace.carleton.ca/d2l/home/234927>

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Welcome to Econometrics I!

"Classroom teaching and learning activities, including lectures, discussions, presentations, etc., by both instructors and students, are copy-protected and remain the intellectual property of their respective author(s). All course materials, including PowerPoint presentations, outlines, and other materials, are also protected by copyright and remain the intellectual property of their respective author(s).

Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s)."

Prerequisites

The prerequisites for this course are ECON 2210 (or equivalent) with a grade of C+ or higher, and ECON 2220 (or equivalent) with a grade of C+ or higher, as outlined in the 2023-2024 Undergraduate Calendar. Students who believe that they have taken a similar background course

or courses from another university must provide appropriate documentation to the Department of Economics Undergraduate Administrator, Renee Lortie [renee.lortie@carleton.ca](mailto:renee.lortie@carleton.ca)

Please note that a grade of C+ or higher in this course is required to qualify for ECON 4707. Also, DEF(erred final grade) status at the end of this course precludes (continued) registration in any other course for which the former is a prerequisite.

### Introduction

An introduction to econometric theory and analysis of the classical normal linear regression model. Topics include estimation methods, hypothesis testing, multicollinearity, indicator variables, heteroskedasticity, and an introduction to time-series methods.

### Learning Outcomes

By the end of this course, students will:

- 1) be conversant with and be able to define key econometric terminology in the context of the classical normal linear regression model (CNLRM)
- 2) be very comfortable with the setup and assumptions of the CNLRM
- 3) have a solid understanding of both estimation and hypothesis testing within the context of the CNLRM
- 4) be able to derive ordinary least squares estimators and establish their properties algebraically
- 5) be very comfortable in interpreting and assessing the quality of an estimated regression model
- 6) understand the key principles of regression model specification
- 7) be aware of common issues associated with the application of the regression model and be able to assess their impact on the properties of ordinary least squares estimators algebraically
- 8) know how to test for these common issues and how to develop a suitable response
- 9) have gained additional experience in the use of modern econometric software and in the interpretation of the relevant output

### Organization

This is an in-person course and is NOT suitable for online students. The class will meet once a week at 11:35 a.m. on Thursdays for a 2 hour and 50 minute session with a short intermission. In addition, an 80-minute tutorial session will be held at 10:05 a.m. on Wednesdays. The tutorial sessions will be used for additional coverage of important course material, together with assignment-related activities.

There will be three (3) required assignments and an in-person final exam.

Please note that Brightspace and the Carleton email system will be used extensively as a means of communication with students. Therefore, students are strongly advised to access Brightspace and to check their Carleton email at regular intervals in order to check for new information. To access Brightspace and the Carleton email system, students require a MyCarletonOne account.

For questions about MyCarletonOne accounts, students should access [carleton.ca/its/get-started/](http://carleton.ca/its/get-started/) (and then click on either New Students or New Grad Students, as appropriate) or contact the ITS Service Desk.

### Attendance

If you plan to succeed in this course, then I cannot overstate the critical importance of regular class and tutorial attendance, together with the allocation of regular and consistent study time outside the classroom. Due to the nature of the course material, many students find that it is very difficult to catch up, should they fall behind.

### Academic Integrity and Plagiarism

Please ensure that you are familiar with and comply with the [Academic Integrity Policy](#)

And, more specifically, with regard to the written work required for this course, please be sure to avoid any form of plagiarism:

The Academic Integrity Policy defines plagiarism as “*presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.*” This includes reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and
- failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotation marks.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of “F” for the course.

### Assignments

Assignments will be posted on Brightspace and will be submitted through Brightspace according to the following schedule:

	<u>Posted</u>	<u>Due</u>
Assignment 1	October 5	October 19
Assignment 2	November 9	November 23
Assignment 3	November 23	December 7

### Final Exam

The final exam will be in-person and comprehensive, and will be scheduled by Examination Services during the regular final examination period (December 10-22). Note that students should not make travel plans during this final examination period as this would not be a valid reason for missing a final exam.

### Evaluation

The final % grade for this course will be calculated as follows:

Assignments	40%	(3 assignments, equally weighted)
Final Examination	60%	

This % grade will then be converted into the alphabetical grade system using the standard equivalences, as outlined in Section 5.4 of the Academic Regulations of the University in the 2023-2024 Undergraduate Calendar.

In the event that one or more components of the term work are not completed, the weight of the incomplete component(s) will not be transferred to the final examination without a documented and compelling reason. In place of a doctor's note or medical certificate, students are advised to complete the self-declaration form, which is available on the Registrar's Office website <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>

Students who do not write the final examination because of illness or other circumstances beyond their control may apply to write a deferred final examination. In order to write a deferred final examination, students must contact the Registrar's Office. (For further details, see Section 4.3 of the Academic Regulations of the University in the 2023-2024 Undergraduate Calendar.) 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. Needless to say, any deferred examination will not be identical to the original final examination.

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

### Required Textbook

The required textbook for this course is:

Dougherty, C. (2016), Introduction to Econometrics (5<sup>th</sup> Edition). Oxford: Oxford University Press. ISBN-10: 0199676828, ISBN-13: 9780199676828 (paperback)

This textbook can be obtained through the Carleton University bookstore  
<https://www.bkstr.com/carletonstore/shop/textbooks-and-course-materials>

An additional textbook that students may find useful is:

Kennedy, P. (2008), A Guide to Econometrics (6<sup>th</sup> Edition). Malden, MA: Blackwell Publishing. ISBN 978-1-4051-8257-7, (paperback)

The Kennedy book is really a “companion” to the study of econometrics rather than an econometrics textbook *per se*. It provides alternative and/or complementary discussions of all the topics treated in the course as well as a bridge to the econometrics literature. It would be particularly useful for students intending to take the sequel to this course, ECON 4707, and/or students intending to continue on to graduate study in economics.

### Computer Package

Use of the STATA software package will be an integral part of this course. Personal copies of STATA will be available for download under Carleton’s STATA site-licence. Details will be provided in class.

### Course Content

1. Introduction and Statistical Review, Dougherty – Introduction and Review.
2. Simple Regression Analysis, Dougherty – Ch. 1.
3. Properties of the Regression Coefficients and Hypothesis Testing, Dougherty – Ch. 2.
4. Multiple Regression Analysis, Dougherty – Ch. 3.
5. Nonlinear Models and Transformations of Variables, Dougherty – Ch. 4.
6. Dummy Variables, Dougherty – Ch. 5.
7. Specification of Regression Variables, Dougherty – Ch. 6.
8. Heteroskedasticity, Dougherty – Ch. 7.
9. Autocorrelation, Dougherty – Section 11.1, Ch. 12.

### Mental Health Resources and Academic Accommodations

Please note that you are responsible for reading and being aware of the information relating to Carleton University and other resources for mental health and academic support, as well as academic accommodations, found [HERE](#)

IF YOU HAVE PROBLEMS WITH THIS COURSE, PLEASE LET ME KNOW!

IF I DON'T KNOW THAT YOU HAVE PROBLEMS, I CAN'T FIX THEM!