

Advanced Econometrics

Department of Economics

ECON 6534 Winter 2024/2025

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledges held by the Mi'kmaq People, and to the wisdom of their Elders past and present. The Mi'kmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights. We are all Treaty people.

Dalhousie University also acknowledges the histories, contributions, and legacies of African Nova Scotians, who have been here for over 400 years.

Course Instructor

Name	Email	Office Hours
Yulia Kotlyarova	yulia.kotlyarova@dal.ca	By appointment 6220 University Ave, C32

Course Description

This is an econometrics course for PhD students. It reviews introductory mathematical statistics including parameter estimation (ML, GMM), hypothesis testing, and asymptotic theory. The parametric and nonparametric models including linear, nonlinear, limited dependent variable, and simultaneous equation models are explored in the context of cross-sectional and time series data.

Course Structure

Lectures (in person): Tuesday and Thursday 10:05 – 11:25 pm Room A1, Economics

The lectures will not be recorded.

Course Materials

Required textbooks:

R. Davidson and J. MacKinnon (2004) "Econometric Theory and Methods", Oxford University Press. A free PDF version of the book is available at <http://qed.econ.queensu.ca/ETM/>.

R. Davidson and J. MacKinnon (1993) "Estimation and Inference in Econometrics", Oxford University Press. A free PDF version of the book is available at <http://qed.econ.queensu.ca/EIE/>.

Additional reading materials will be posted on Brightspace or distributed in class. Please check regularly the course page on Brightspace for course announcements and assignments.

Other useful textbooks:

Greene, W. "Econometric Analysis", Pearson, editions 6, 7 or 8

Hamilton, J. (1994) "Time Series Analysis", Princeton University Press

Hansen, B. (2022) "Econometrics", Princeton University Press

Li, Q. and J. Racine (2007) "Nonparametric econometrics: theory and practice", Princeton University Press

Spanos, A. (1999) "Probability theory and statistical inference: econometric modeling with observational data", Cambridge University Press

Wooldridge, J. (2010) "Econometric Analysis of Cross Section and Panel Data", MIT Press

Software

Statistical packages STATA and R (open source). Stata/SE 18 can be downloaded at <https://software.library.dal.ca/>.

Assessment

Component	Weight, % of final grade	Date
<i>4 assignments</i>	30%	to be determined
<i>Midterm</i>	30% (80 min, in person)	in class, 27 February 2025 (tentative)
<i>Final exam</i>	40% (3 hrs, in person)	scheduled exam period

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Faculty of Graduate Studies Scale:

A+ (90-100) **A** (85-89) **A-** (80-84) **B+** (77-79) **B** (73-76) **B-** (70-72) **F** (<70)

Course Policies on Missed or Late Academic Requirements

There will be no make-up midterm exam. If students miss the midterm for a valid reason, they must inform the instructor by email on the day of the exam (or earlier). Their final exam will count for 70% of the final grade.

If a student cannot submit an assignment on time for a valid reason, the student must contact the instructor prior to the assignment deadline to discuss alternative arrangements.

If a student misses the final exam for a valid reason, the student must notify the instructor as soon as possible. The student will have an opportunity to write a make-up final exam.

Course Policies related to Academic Integrity

The students are not allowed to collaborate on the assignments and exams. The full text of Dalhousie's *Policy on Intellectual Honesty* and *Faculty Discipline Procedures* is available here: http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

Learning Objectives

This course is designed to give students a working knowledge of various topics in econometric theory. The students will learn how to apply asymptotic theory and Monte Carlo simulations to analyze the properties of parametric/nonparametric estimators and testing procedures in cross-sectional and time-series settings.

Course Content

1. Review of probability and statistics: characteristics of a random variable, modes of convergence, laws of large numbers, central limit theorems
2. Monte Carlo studies: design, random number generators
3. Maximum likelihood estimation: asymptotic properties, testing procedures, pseudo-MLE
4. Nonparametric estimation: kernel-density estimator, nonparametric regressions
5. Stationary univariate time series: properties, estimation, forecasting
6. Unit-root processes
7. Introduction to Bayesian methods

University Policies and Statements

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit or e-mail the Indigenous Student Centre at 1321 Edward St or elders@dal.ca. Additional information regarding the Indigenous Student Centre can be found at: https://www.dal.ca/campus_life/communities/indigenous.html

Internationalization

At Dalhousie, 'thinking and acting globally' enhances the quality and impact of education, supporting learning that is "interdisciplinary, cross-cultural, global in reach, and orientated toward solving problems that extend across national borders." Additional internationalization information can be found at: <https://www.dal.ca/about-dal/internationalization.html>

Academic Integrity

At Dalhousie University, we are guided in all our work by the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, you are required to demonstrate these values in all the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity. Additional academic integrity information can be found at: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Student Accessibility Centre is Dalhousie's centre of expertise for matters related to student accessibility and accommodation. If there are aspects of the design, instruction, and/or experiences within this course (online or in-person) that result in barriers to your inclusion, please contact the Student Accessibility Centre (https://www.dal.ca/campus_life/academic-support/accessibility.html) for all courses offered by Dalhousie with the exception of Truro. For courses offered by the Faculty of Agriculture, please contact the Student Success Centre in Truro (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Conduct in the Classroom – Culture of Respect

Substantial and constructive dialogue on challenging issues is an important part of academic inquiry and exchange. It requires willingness to listen and tolerance of opposing points of view. Consideration of individual differences and alternative viewpoints is required of all class members, towards each other, towards instructors, and towards guest speakers. While expressions of differing perspectives are welcome and encouraged, the words and language used should remain within acceptable bounds of civility and respect.

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness (Strategic Priority 5.2). Additional diversity and inclusion information can be found at: <http://www.dal.ca/cultureofrespect.html>

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution. The full Code of Student Conduct can be found at:

https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Fair Dealing Policy

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie. Additional information regarding the Fair Dealing Policy can be found at: https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy-.html

Originality Checking Software

The course instructor may use Dalhousie's approved originality checking software and Google to check the originality of any work submitted for credit, in accordance with the Student Submission of Assignments and Use of Originality Checking Software Policy. Students are free, without penalty of grade, to choose an alternative method of attesting to the authenticity of their work and must inform the instructor no later than the last day to add/drop classes of their intent to choose an alternate method. Additional information regarding Originality Checking Software can be found at: <https://www.dal.ca/about/leadership-governance/academic-integrity/faculty-resources/ouriginal-plagiarism-detection.html>

Student Use of Course Materials

Course materials are designed for use as part of this course at Dalhousie University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as books, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this course material for distribution (e.g. uploading to a commercial third-party website) may lead to a violation of Copyright law.