



Faculty of Science Course Syllabus

Department of Economics

Advanced Econometrics, ECON 6534

Winter 2026

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Instructor

Nicholas Lawson, nicholas.lawson@dal.ca

Office: 6220 University Avenue, Office C14

Office Hours: Tuesdays, 10:30 am-11:45 am (or by appointment)

Timetable

Lectures: Tuesdays & Thursdays, 2:35 pm-3:55 pm, McCain 2021

Communication

When I need to communicate information to you all, I will send an email to the class through Brightspace. You are responsible for checking your email account so as not to miss important messages. To contact me, send an email to nicholas.lawson@dal.ca, with "ECON 6534" in the subject, and I will respond within 24 hours (except weekends). I also make in-class announcements at the start of each class. I will be available to meet with students in my office during my office hours, but you can also contact me by email at any time, and I will also be available for meetings at other times by appointment, in my office or on Teams.

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 Objectives

This course aims to provide the student with an analytical framework as well as advanced statistical tools in order to conduct empirical studies in microeconomics and macroeconomics which are useful to public decision-makers as well as to the academic community. The course is divided into four sections: 1) identification strategies in microeconometrics; 2) microeconomic methods of estimation and testing; 3) applied microeconomic models; and 4) macroeconomic (time-series) models.

Course Organization

The course combines theoretical and applied elements: in my lectures, I will concentrate on the foundations of econometric theory, using my own lecture notes, as well as some empirical applications in Stata. I have also prepared Stata tutorial files which you can work through on your own; there is no scheduled tutorial for this class, but you can ask me for help with the tutorial files if needed. The course notes and tutorial files are available on Brightspace, and all lectures and tutorials will be in-person.

Assessment

<i>Component</i>	<i>Due Date</i>	<i>Weight (% of final grade)</i>
Assignment #1	February 12	20%
Midterm Exam	February 24	20%
Assignment #2	April 9	20%
Final Exam	Exam Period (April 11-27)	40%

The assignments will be available on Brightspace, and will require the use of Stata. You will work on your own, and you will submit a written report as well as your Stata log file(s). You may talk with other students about the questions, but copying from another student, or submitting work that is not your own, is not permitted. Each assignment must be submitted before 11:59 pm on the due date; you can submit a paper copy in person or a PDF copy on Brightspace. Late assignments will be marked down by 1% per hour.

In exceptional circumstances, if a student cannot submit an assignment by the due date, the student must contact me before the deadline to discuss alternative arrangements.

Exams are “closed-book” and will take place in person. If a student is unable to write an exam, they must contact me by email prior to the date and time of the exam, and submit a completed Student Declaration of Absence by email (no medical note is required). If a student misses the

midterm exam, its weight will be added to the final exam. If a student misses the final exam, they will have the opportunity to write a make-up exam.

All students are encouraged to read the information about Dalhousie’s policy regarding academic integrity at <https://www.dal.ca/about/leadership-governance/academic-integrity.html>. If you haven’t already done so, you are very strongly encouraged to complete the Writing Centre’s Academic Integrity Module; see <https://dal.sharepoint.com/sites/student-affairs/SitePages/Academic-Integrity.aspx> for more information.

I will provide you with your grades throughout the semester using the Brightspace Gradebook tool.

Conversion of Numerical Grades to Final Letter Grades (Dalhousie Grading Scale)

Letter Grade	Range	Letter Grade	Range
A+	90-100	B+	77-79
A	85-89	B	73-76
A-	80-84	B-	70-72
		F	0-69

Note: The ranges specified in the table refer to the two digits before the decimal; therefore, a grade of 76.99, for example, would be converted to a B, not a B+.

Textbooks

There are two principal textbooks for this course. For the section on microeconometrics, we will use:

- A. Colin Cameron & Pravin K. Trivedi, *Microeconometrics: Methods and Applications*. Cambridge University Press, 2005.

The book can be read for free on the ProQuest website, through a Dalhousie Libraries page at https://dal.novanet.ca/permalink/01NOVA_DAL/1nek75v/alma9970587578907190. A copy is also available at Killam Library, and it can be purchased at the Dalhousie Bookstore; see [https://bookstore.dal.ca/CourseSearch/?course\[\]=SUB,202620,ECON,ECON6534,01](https://bookstore.dal.ca/CourseSearch/?course[]=SUB,202620,ECON,ECON6534,01). The same authors have also written a users’ guide for Stata:

- A. Colin Cameron & Pravin K. Trivedi, *Microeconometrics using Stata*, Second Edition. Stata Press, 2022.

The first edition from 2010 is also useful, though relatively out-of-date by now. We will not use this book directly in the course, but it is a useful companion for new Stata users, and many of the tutorial exercises are derived from it. It is available on Amazon, as well as at www.stata.com/bookstore/musr.html; the first edition is available at Killam Library, and the second edition is available at Patrick Power Library at St. Mary’s University (volume 2 is also available online through the Dalhousie Libraries).

The second textbook covers the macroeconometrics section of the course:

- James D. Hamilton, *Time Series Analysis*. Princeton University Press, 1994.

The book can be purchased upon request at the Dalhousie Bookstore; see

[https://bookstore.dal.ca/CourseSearch/?course\[\]=SUB,202620,ECON,ECON6534,01](https://bookstore.dal.ca/CourseSearch/?course[]=SUB,202620,ECON,ECON6534,01). A copy is also available at Killam Library. We will also use several other sources on macroeconometrics that I will provide during the course.

Useful References

There are numerous other high-quality textbooks for graduate studies in econometrics, which can be useful references if you have access to them. My favourite econometrics textbook is:

- Russell Davidson & James G. MacKinnon, *Econometric Theory and Methods*. Oxford University Press, 2004.

This book is at a slightly lower level (MA instead of PhD), and the presentation tends towards simulation-based methods. However, I believe that all economists should read chapter 2 (“The Geometry of Linear Regression”) at least once in their career. The book is now available as a free PDF at <http://qed.econ.queensu.ca/ETM/>, as is their previous textbook (“Estimation and Inference in Econometrics”) at <http://qed.econ.queensu.ca/EIE/>.

Other popular textbooks include:

- Fumio Hayashi, *Econometrics*. Princeton University Press, 2000.
- Jeffrey M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data, Second Edition*. MIT Press, 2010.
- William H. Greene, *Econometric Analysis, 8th Edition*. Pearson, 2017.
- Bruce E. Hansen, *Econometrics*. Princeton University Press, 2022.

Software

You will need to use Stata for your assignments, and the tutorial files will present the commands and techniques that you will need to use in Stata. A one-year Stata/SE Student license is available for free to all Dalhousie Students, and you can download Stata/SE 18 at

<https://software.library.dal.ca/>.

Course Schedule (Approximate)

The course is divided into four sections:

- (1) Empirical Strategies in Microeconometrics (OLS; treatment effects; IV; fixed effects; difference-in-difference; discontinuity)
- (2) Estimators in Microeconometrics (ML; NLS; GMM; tests)
- (3) Applications in Microeconometrics (quantile & non-parametric; qualitative dependent variables: binary, multinomial; limited dependent variables: truncation, censoring; selection; survival; simulation methods)
- (4) Macroeconometrics (stationary univariate time series; unit roots; Bayesian methods)

Section	Weeks	Subjects & Chapters
1	1: January 8 2: January 13 & 15 3: January 20 & 22	Empirical Strategies in Microeconometrics <ul style="list-style-type: none"> • OLS & Treatment Effects (MMA 1-2, 4, 24-26) • IV & Fixed Effects (MMA 4, 21, 25-26) • Difference-in-Difference & Discontinuity (MMA 3, 22, 25)
2	4: January 27 & 29 5: February 3 & 5 6: February 10 & 12 7: Winter Study Break	Estimators in Microeconometrics <ul style="list-style-type: none"> • Maximum Likelihood & NLS (MMA 5, 10) • Generalized Method of Moments (GMM) (MMA 6) • Hypothesis and Specification Tests (MMA 7-8, 10)
	February 24	<i>Midterm Exam</i>
3	8: February 26 9: March 3 & 5 10: March 10 & 12 11: March 17 & 19	Applications in Microeconometrics <ul style="list-style-type: none"> • Quantile & Non-Parametric (MMA 4.6, 9) • Qualitative Dependent Variables (MMA 14-15, 23) • Limited Dependent Variables & Selection (MMA 16, 23) • Survival & Simulation Methods (MMA 6.7, 12, 17-18)
4	12: March 24 & 26 13: March 31 & April 2 14: April 7	Macroeconometrics <ul style="list-style-type: none"> • Stationary Univariate Time Series (TSA 1-5) • Unit Roots (TSA 15.1, 15.3, 17) • Bayesian Methods (TSA 12)
Exam Period	April 11-27	<i>Final Exam</i>

Note: MMA refers to the Cameron & Trivedi textbook (“Microeconometrics: Methods and Applications”), and TSA refers to the Hamilton textbook (“Time Series Analysis”).

Suggested Tutorial Schedule

Weeks	Subjects
2	1) Introduction to Stata 2) OLS & GLS
3	3) IV & Panel
4	4) DD & RD
5	5) Non-Linear, ML & Optimization
6	6) GMM & Tests
8	7) Quantile & NP
9	8) Binomial
10	9) Multinomial
11	10) Censoring & Selection 11) Count Data & Survival
12	12) Simulation Methods 13) Stationary Univariate Time Series
13	14) Unit Roots

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 Mi'kmaq and Indigenous Relations (including the Elders in Residence program, Land Acknowledgements, Understanding Our Roots, and much more) can be found at: <https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.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/mission-vision-values/global-relations.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/campus_life/ssc.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: <https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion.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/content/dam/www/about/leadership-and-governance/governing-bodies/code-student-conduct.pdf>

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/content/dam/www/about/leadership-and-governance/university-policies/fair-dealing-policy.pdf>

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.

Student Resources and Support

University Policies and Programs

- Important Dates in the Academic Year (including add/drop dates):
http://www.dal.ca/academics/important_dates.html
- Classroom Recording Protocol:
<https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/class-recording-protocol.pdf>
- Dalhousie Grading Practices Policies:
<https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/grading-practices-policy.pdf>
- Grade Appeal Process: https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html
- Sexualized Violence Policy: <https://www.dal.ca/content/dam/www/about/leadership-and-governance/university-policies/sexualized-violence-policy.pdf>
- Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

Learning and Support Resources

- General Academic Support – Advising (Halifax):
https://www.dal.ca/campus_life/academic-support/advising.html
- General Academic Support – Advising (Truro):
https://www.dal.ca/campus_life/ssc.html
- Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness.html
- On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond): https://www.dal.ca/campus_life/academic-support/On-track.html
- Indigenous Student Centre:
https://www.dal.ca/campus_life/communities/indigenous.html
- Mi'kmaq and Indigenous Relations:
<https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations.html>
- Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel, and support. Visit the office in the Indigenous Student Centre or contact the program at elders@dal.ca or 902-494-6803:
<https://www.dal.ca/about/mission-vision-values/mikmaq-indigenous-relations/elders-in-residence-and-traditional-knowledge-keepers.html>

- Black Student Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
- International Centre: https://www.dal.ca/campus_life/international-centre.html
- LGBTQ2SIA+ Collaborative: <https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion/community-specific-groups/lgbtq2sia-collaborative.html>
- Dalhousie Libraries: <http://libraries.dal.ca/>
- Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>
- Dalhousie Student Advocacy Services: <https://www.dsu.ca/dsas?rq=student%20advocacy>
- Dalhousie Ombudsperson: https://www.dal.ca/campus_life/safety-respect/ombudsperson.html
- Human Rights and Equity Services: <https://www.dal.ca/about/mission-vision-values/equity-diversity-inclusion-and-accessibility/about-office-equity-inclusion/human-rights-and-equity-services.html>
- Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
- Study Skills/Tutoring: http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
- Faculty of Science Advising Support: <https://www.dal.ca/faculty/science/current-students/undergrad-students/degree-planning.html>

Safety

- Biosafety: <http://www.dal.ca/dept/safety/programs-services/biosafety.html>
- Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>
- Radiation Safety: <http://www.dal.ca/dept/safety/programs-services/radiation-safety.html>
- Laser Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety/laser-safety.html>