

**Faculty of Science Course Syllabus
Department of Economics
Econometrics I, ECON 5575
Fall 2023**

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.

Instructor:

Christos Ntantamis

Office: 6220 University Avenue (Economics Department), C25

Phone: (902) 4946462

e-mail: christos.ntantamis@dal.ca

Timetable:

Lecture Hours:

- Monday and Wednesday, 10:05-11:25, McCain Arts & Social Sciences 2198

Office Hours:

- Thursday, 09.30-11.00 (or by appointment)

Course Description:

This course is designed to introduce the student to the practical problems encountered in estimating econometric models. Violations of the assumptions of the classical linear model are frequently found in economic data. Procedures for estimation and forecasting under these conditions (heteroscedasticity, autocorrelation, multicollinearity) are discussed. An important aim of this course is to give the student a working knowledge of estimation techniques commonly used by economists.

Objectives of the course:

This course introduces statistical tools for handling economic and financial data generated in uncontrolled environments, and the techniques involved in their use.

Learning outcomes and competences:

The objectives of the course are that the participants can:

- formulate the multiple linear regression model and its underlying assumptions examine the procedure of Ordinary Least Squares for its estimation,
- conduct hypothesis testing on economic questions based on estimates from regression models,
- describe the statistical properties of the estimated parameters,

- derive the statistics required for hypothesis testing concerning the parameters of multiple regression models,
- describe the consequences of multicollinearity, omitted variables, functional form misspecification, and heteroskedasticity in multiple regression models,
- evaluate the adequacy of the estimated regression models by performing test for neglected heteroskedasticity and autocorrelation,
- apply efficient estimation in regression models with heteroskedastic innovations,
- derive and discuss estimation for models that are nonlinear in parameters,

Format:

Regular lectures

Material:

- Davidson R., and J.G. MacKinnon, (2021). *Econometric Theory and Methods*, Oxford University Press (New York)
 - + Available (free) at:
 - + <http://econ.queensu.ca/ETM/ETM-davidson-mackinnon-2021.pdf>
- Supplementary Textbooks:
 - + Greene, W. H, (2012). *Econometric Analysis*, 7th ed. Prentice Hall.
 - + Verbeek M., (2012). *A Guide to Modern Econometrics*, 4th ed., Wiley
- Additional Notes, as required: available via [Brightspace](#).

Software:

- **Gretl**
 - + Gretl is freeware econometric software, which can be downloaded at: <http://gretl.sourceforge.net/>.
- **R**
 - + R is freeware software used by many researchers for econometrics and statistics. It is available at: <http://www.r-project.org/>
 - + RStudio Desktop is an integrated development environment (IDE) for R. It is available at: <https://www.rstudio.com/products/rstudio/#Desktop>
- **STATA**
 - + A one-year STATA/SE Student license is available to all Dalhousie Students. Students can download Stata/SE 18 at: <https://software.library.dal.ca/>

A short discussion about the above packages and other statistical software will take place during the first class. Students will be free to choose the statistical package of their preference.

Assessment:

- Assignments: 30%
 - + Bi-weekly assignments involving theoretical and computer exercises.
- Midterm Exam: 30%

- Final Exam (comprehensive): 40%
- Missing assessment elements:
 - Assignments
 - + Late assignments will be marked down by 20 percent per day. Any exception requires a legitimate reason listed in the Dalhousie University Calendar under section 16.8 of “Academic Regulations.”
 - Exams
 - + If a student is unable to attend the midterm exam, they must contact the instructor by email prior to the date and time of the exam and submit a completed Student Declaration of Absence via Brightspace or by email (no medical note is required). The weight of the midterm exam will be added to the final exam.
 - + If a student misses the final exam for a valid reason, (Section 16.8 of the University Calendar), they must notify the instructor immediately. The student will have the opportunity to write up a make-up exam.

Policies related to Academic Integrity:

- Assignments
 - + Assignments are individual assignments. Copying and/or cooperation is not permitted, and it constitutes a serious academic offence (see Academic Integrity).

Grading scheme:

The following table describes the grading scale to be applied in the course.

**Grading Scale as per Dalhousie Faculty of Graduate Studies Calendar
Regulation 7.6.2 Grading Policy**

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

Notes:

1. As per FGS regulations students must obtain a final course grade of 70% (B-) or higher to pass the course (study carefully the grading scale).

Important Dates (midterm date is tentative):

- Midterm Exam: October 18th
- Fall study break: November 13th- November 17th.
- Final Exam: Regular exam period (Dec 8th – Dec 19th)

Email Policy:

- Weekdays: emails received by 18.00 would be responded by the end of the day. Anything after that time would be responded in the following day.
- Weekends: emails are to be checked sporadically and you should not expect a response within the same day.
- Lengthy questions are easier and preferable to be answered during office hours.
- Make sure that you have checked the course outline and all material available in Brightspace prior to asking a question.

Course contents:

Dates	Topic	Material
Week 1	Course Outline	Slides
Week 2	Review +Probability Theory, Distributions, Asymptotic Theory +Matrix Algebra	Notes Ch. 1, Ch.4.3
Weeks 3 and 4	Geometry of Linear Regression +Geometry of OLS Estimation +FWL Theorem	Notes, Ch. 2
Weeks 5 & 6	Statistical Properties of OLS	Notes, Ch. 3

October 18th: Midterm Exam

Weeks 7 & 8	Hypothesis Testing	Notes, Ch. 4, Ch. 5
Week 9	Confidence Intervals	Notes, Ch. 5
Weeks 10 & 12	Generalized Least Squares	Notes, Ch. 7.1-7.5

Week no 11, Study Break: November 13th – November 17th

Weeks 13 & 14	Nonlinear Regression	Notes, Ch. 6
------------------	-----------------------------	-----------------

December 6th: Review
December 9th- December 20th: Final Exam Period
Notes:

 Week 01: Sep 6th

 Week 02: Sep 11th, Sep 13th

 Week 03: Sep 18th, Sep 20th

 Week 04: Sep 25th, Sep 27th

 Week 05: Oct 4th

 Week 06: Oct 11th

 Week 07: Oct 16th, Oct 18th

 Week 08: Oct 23rd, Oct 25th

 Week 09: Oct 30th, Nov 1st

 Week 10: Nov 6th – Nov 8th

 Week 11: Nov 13th, Nov 15th

 Week 12: Nov 20th, Nov 22nd

 Week 13: Nov 27th, Nov 29th

 Week 14: Dec 4th, Dec 5th

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

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/dept/university_secretariat/policies/academic/student-submission-of-assignments-and-use-of-originality-checking-software-policy.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.

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/dept/university_secretariat/policies/academic/classroom-recording-protocol.html

Dalhousie Grading Practices Policies:

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

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/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html

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/about-dal/agricultural-campus/ssc/academic-support/advising.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

Indigenous Connection:

<https://www.dal.ca/about-dal/indigenous-connection.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://cdn.dal.ca/content/dam/dalhousie/pdf/academics/UG/indigenous-studies/Elder-Protocol-July2018.pdf>

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

South House Sexual and Gender Resource Centre:

<https://southhousehalifax.ca/about/>

LGBTQ2SIA+ Collaborative:

<https://www.dal.ca/dept/vpei/edia/education/community-specific-spaces/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/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Human Rights and Equity Services:

<https://www.dal.ca/dept/hres.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>

DEPARTMENT OF ECONOMICS STATEMENT ON ACADEMIC INTEGRITY

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility, and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean?

Academic integrity means being honest in the fulfillment of your academic responsibilities, thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. “Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs.”

(<http://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=1&chapterid=89&topicgroupid=381&loadusercredits=False>)

How can you achieve academic integrity?

- Make sure you understand Dalhousie’s policies on academic integrity.
- While discussion with your fellow students is valuable, do not submit an assignment or essay that is essentially identical to an assignment or essay submitted by another individual or group.
- In assignments or essays, use an approved method of citation for any material taken directly from an existing source or any material that is a paraphrase of an existing source.
- Do not download the work of another from the Internet and submit it as your own.
- Do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor.
- Do not have someone else write a test for you, or write a test for someone else.
- During a test, do not talk with other students and do not try to copy the work of another student.

What will happen if an allegation of an academic offence is made against you?

Instructors are required to report any suspected offence. The full process is outlined in the Discipline flow chart (found at <http://academicintegrity.dal.ca>) and includes the following:

- Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors.
- The AIO decides whether to proceed with the allegation and you will be notified of the process.
- If the case proceeds, you will receive a PENDING grade until the matter is resolved.
- If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment, or failure of the course. All penalties are academic in nature.

Where can you turn for help?

- If you are ever unsure about ANYTHING, contact your instructor.
- See <http://academicintegrity.dal.ca> for links to policies, definitions, online tutorials, and tips on citing and paraphrasing.
- See <http://writingcentre.dal.ca> for assistance with proofreading, writing styles, and citations.
- See <http://libraries.dal.ca/research.html> for a set of research tools including Subject Guides, Assignment Calculator, and RefWorks.
- See <http://studentservices.dal.ca> for assistance with appeals and discipline procedures.
- See <http://senate.dal.ca> for a list of Academic Integrity Officers, a discipline flow chart, and the Senate Discipline Committee.

The [Policy on Student Submission of Assignments & Use of Originality Checking Software](#) states that “any instructor may require student assignments to be submitted in both written and electronic (computer-readable) form, e.g., a text file or as an email attachment, as defined by the instructor. Use of third-party originality checking software does not preclude instructor use of alternate means to identify lapses in originality and attribution. The results of such assessment may be used as evidence in any disciplinary action taken by the Senate.”