

**Faculty of Science Course Syllabus  
Department of Economics  
Econometrics II, ECON 5576  
Winter 2026**

*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

e-mail: christos.ntantamis@dal.ca

**Timetable:**

Lecture Hours:

- Tuesday and Thursday, 8:35-9:55, McCain2162

Office Hours:

- Wednesday 09:30-11:30 (or by appointment)

**Course Description:**

This course builds on the material learned in ECON 5575. Its primary objective is to extend the student's capabilities to conduct quantitative research in economics and to examine critically the existing literature based on quantitative research. The topics of this course include instrumental variables, maximum likelihood estimation, time series models, panel data models, and nonparametric methods.

**Course Prerequisites:**

ECON5575 OR Permission from the Instructor.

**Course Objectives:**

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:

- apply efficient estimation in regression models with heteroskedastic innovations

- define, estimate, and perform hypothesis testing for nonlinear regression models
- derive and apply maximum likelihood estimation and specification tests
- derive and apply models for binary dependent variable as well as for multinomial (ordered and unordered) response variables
- estimate and perform hypothesis testing in multiple regression models in a panel data framework, and discuss and apply the difference-in-difference approach
- define the endogeneity issues in estimating regression models, and testing
- discuss the Instrumental Variables approach as a solution to endogeneity problems
- discuss the dependence and stationarity properties of time series data,
- formulate ARMA models, and discuss issues about estimation, statistical inference and forecasting
- describe and apply the testing procedure for unit root processes (Dickey-Fuller test)
- formulate the VAR model, and derive its properties, including the calculation of impulse response functions
- introduce the notion of cointegration, and define and analyze the co integrated VAR model, and the VECM model
- reflect on additional topics within econometrics with a view towards empirical applications

**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, (2017). Econometric Analysis, 8th ed. Prentice Hall.
- Additional Notes, as required: available via [Brightspace](#).

**Software:**

- **Gretl**
  - + Gretl is freeware econometric software, which can be downloaded in <http://gretl.sourceforge.net/>.
- **R**
  - + R is freeware software used by many researchers for econometrics and statistics. It is available in: <http://www.r-project.org/>
- **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. Although students are free to choose the statistical package of their preference, demonstration of concepts will be based on Gretl.*

**Format:**

- Lectures
- Computer Exercises

**Assessment:**

Academic Calendar regulation 16.1: “In order to complete a course satisfactorily, a student must fulfill all the requirements as set down in the course outline.”

- Assignments: 20%
  - + (approximately) Bi-weekly assignments involving theoretical and computer exercises.
- One of the following two options:
  - + Literature Review- additional topic: 20%
    - Summary: 10%
    - Class lecture: 10%
    - The students will provide a critical summary for a topic of interest not covered in class, which will then be presented in class.
  - + Empirical Paper: 20%
    - Paper: 15%, In class presentation: 5%
    - Use of econometric methodologies discussed at the beginning of the class.
- Midterm Exam: 20%
- Final Exam (comprehensive): 40%
- Notes:
  - Assignments
    - + Assignments will be posted online (Brightspace course page).
    - + Scanned pdf files of completed regular assignments are submitted to specific folders under “Assessments” tab in Brightspace.
  - Exams
    - + Examinations are “closed book” and materials other than those mentioned should not be used. There is no supplemental privilege in this course.
    - To pass the course, a student must achieve an overall passing grade and a minimum grade of 40% on the final examination, which covers material drawn from the entire course.
- 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.”
    - + Students unable to submit a regular assignment, they must contact the instructor by email prior to the date and time of the assessment and submit a completed Student Declaration of Absence (SDA) form via Brightspace or by email (no medical note is required). The weight of the missed assignment will be equally distributed among the other assignments.
  - Non-Course Topic Report/Presentation
    - + Students will work in providing a critical summary for a topic of interest not covered in class, which will then be presented to the fellow students.
      - Fractionally Integrated Processes, Realized Volatility, Extreme Value Models, Threshold Models

- + Details about the deliverables will be provided in separate documents.
- Empirical Project
- + Students will work on a short academic paper, focusing on an empirical application of one of the methodologies discussed early in the course.
- + Details about the deliverables will be provided in separate documents.
- 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.

**Note that the SDA form can only be used twice during the term.**

#### **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).
- Special Topic Reports
  - + Reports are individual assessments. Copying and/or cooperation is not permitted, and it constitutes a serious academic offence. Furthermore, you should be mindful about citing source theory material (see Academic Integrity).
- Empirical Project
  - + The project is an individual project that must be completed independently by each student. Plagiarism is a serious academic offence
- You should refrain from using generative AI and large language models (e.g., ChatGPT).

#### **Grading scheme:**

A+	A	A-	B+	B	B-	C+	C	C-	D	F
90-100	85-89	80-84	77-79	73-76	70-72	65-69	60-64	55-59	50-54	<50

#### **Important Dates (midterm date is tentative):**

- Last Day to Change and Add Classes for registered students: January 22<sup>nd</sup>
- Last Day to Drop without “W”: February 5<sup>th</sup>
- Last Day to Drop with “W”: March 9<sup>th</sup>
- Last Day of Classes: April 6<sup>th</sup>
- Special Topic/Project due date: April 2<sup>nd</sup>
- Winter study break: February 16<sup>th</sup>-20<sup>th</sup>
- **Midterm Exam:** February 24<sup>th</sup> (**in class**)
- **Final Exam:** TBD

**Course Policies:****Email Policy:**

- Weekdays: emails received by 18.00 would be responded by the end of the day. Anything after that hour would be responded in the following day.
- Weekends: emails are to be checked sporadically; thus 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/schedule:**

<b>Dates</b>	<b>Topic</b>	<b>Material</b>
January 8 <sup>th</sup> , 13 <sup>th</sup> , 15 <sup>th</sup>	<b>Administrative Topics Review/ Nonlinear Regression</b>	Notes Ch. 6
January 20 <sup>th</sup> , 22 <sup>nd</sup> , 27 <sup>th</sup>	<b>Maximum Likelihood Estimation</b>	Notes, Ch. 10
January 29 <sup>th</sup> February 3 <sup>rd</sup> , 5 <sup>th</sup>	<b>Discrete and Limited Dependent Variables</b>	Notes, Ch. 11
February 10 <sup>th</sup> , 12 <sup>th</sup>	<b>Generalized Least Squares- Serial Correlation</b>	Notes, Ch. 7.6-7.9
<b>February 16<sup>th</sup> -20<sup>th</sup>: Winter Break</b>		
<b>February 24<sup>th</sup>: Midterm Exam</b>		
February 26 <sup>th</sup> March 3 <sup>rd</sup>	<b>Panel Data</b>	Notes, Ch. 7.10
March 5 <sup>th</sup> , 10 <sup>th</sup> , 12 <sup>th</sup>	<b>Instrumental Variables</b>	Notes, Ch. 8
March 17 <sup>th</sup> , 19 <sup>th</sup> , 24 <sup>th</sup> , 26 <sup>th</sup> April 2 <sup>nd</sup>	<b>Time Series Models</b>	Notes, Ch. 13, 14
April 7 <sup>th</sup>	<b>Additional Topics: Students' Lectures Or Empirical Paper Presentation</b>	
<b>Final Exam: TBD</b>		

## 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](mailto: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](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](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](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](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](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](https://www.dal.ca/campus_life/academic-support/advising.html)

General Academic Support – Advising (Truro): [https://www.dal.ca/campus\\_life/ssc.html](https://www.dal.ca/campus_life/ssc.html)

Student Health & Wellness Centre: [https://www.dal.ca/campus\\_life/health-and-wellness.html](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](https://www.dal.ca/campus_life/academic-support/On-track.html)

Indigenous Student Centre: [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](mailto: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](https://www.dal.ca/campus_life/communities/black-student-advising.html)

International Centre: [https://www.dal.ca/campus\\_life/international-centre.html](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](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](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](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.”