

**Faculty of Science Course Syllabus  
Department of Economics  
Econometrics I, ECON 3338 (01)  
Fall 2022**

*Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.*

*We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.*

**Instructor:**

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**Teaching Assistants:**

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**Timetable:**

Lecture Hours:

- Wednesday/Friday, 11:35am-12:55pm, Killam Library 2622

Tutorial Hours:

- Wednesday, 4:05pm-5:25pm, Killam Library 4106

Office Hours (via MS Teams):

- Instructor: Tuesday, 10:30am-12:00pm (or by appointment)
- Teaching Assistant: TBD

**Prerequisites:**

MATH 1000.03 (or equivalent) MATH 2060.03/STAT 2060.03, with minimum grades of C

**Course Description:**

The theory of some quantitative methods commonly used by economists is discussed in the context of the classical linear model. Estimation problems caused by violations of the assumptions of the classical model are studied including heteroscedasticity and autocorrelation.

**Objectives of the course:**

This course introduces statistical tools for handling economic and financial data generated in uncontrolled environments.

**Learning outcomes and competences:**

The objectives of the course are that the participants can:

- formulate the simple linear regression model and examine the procedure of Ordinary Least Squares for its estimation
- conduct hypothesis testing on economic questions based on estimates from single regression models
- formulate the multiple linear regression model and its underlying assumptions
- estimate and interpret the parameters of multiple linear regressions
- describe the statistical properties of the estimated parameters
- apply hypothesis testing concerning the parameters of multiple regression models
- apply the estimated regression model to compute forecasts and to interpret the precision of these forecasts
- understand the consequences of multicollinearity, omitted variables, functional form misspecification, heteroskedasticity and autocorrelation in multiple regression models
- evaluate the adequacy of the estimated regression models by performing tests for omitted variables functional form misspecification, neglected heteroskedasticity, and autocorrelation
- apply efficient estimation in regression models with heteroskedastic innovations
- understand how to use matrix algebra to derive ordinary least squares estimator's formulae and examine the properties of the estimator

**Course contents:**

1. Regression analysis with a single explanatory variable (Simple Regression)
2. Regression analysis with several explanatory variables (Multiple Regression).
3. Model estimation and specification.
4. Hypothesis testing in simple and multiple regressions.
5. Partial regression.
6. Asymptotic Properties of Ordinary Least Squares
7. Functional form, dummy variables and parameter stability.
8. Heteroskedasticity.
9. Ordinary Least Squares in Matrix Notation

**Format:**

Regular in-person lectures, in-person/online tutorials, online instructor's office hours, and online TA's office hours

**Material:**

- Required Textbook:
  - + Jeffrey M. Wooldridge, "Introductory Econometrics: A Modern Approach", 7th Edition, South-Western College Pub. (Chapters 1-9, Appendices A, B, C)
  - + MindTap Online Access (Cengage)
  - + The Dalhousie bookstore carries two versions:
    - Physical textbook (loose leaf), which includes access to MindTap (~\$140)
    - MindTap software only with access to the e-version for the textbook (~\$100)
  - + Using MindTap software can be very helpful towards your preparation for the course.
  - + Course Key: *MTPQ-ZKSZ-RQRP*
- 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 17 at: <https://software.library.dal.ca/>

*There is no restriction on which software you use for your Data Assignments and Project. Nevertheless, tutorial support will be offered only for the programs listed above.*

**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.”

- Online Quizzes (5: Topics 1 to 5): 15%
  - + Timed Quizzes with focus on testing theoretical concepts. Administered via Brightspace.
  - + The worst quiz won't count towards grade.
- 3 Regular Assignments (Topics 2-4): 15%, equal weight across assignments
  - + Include theoretical derivations and computer exercises.
  - + The weight will be equally distributed among all regular assignments.
- Midterm Exam (in class): 15%
- Final Term Project (individual): 20%
  - + Although the choice of topic is at the student's discretion, it would need to be approved by the instructor.
  - + Specific directions will be provided early in the term concerning:
    - Format
    - Data Sources
    - Expected content
  - + Pdf files of the proposal and preliminary draft for Term Project must be submitted to specific folders under “Assessment” tab in Brightspace prior to or on the due date (not graded and for feedback only).
  - + Pdf files of Final Term Project must be submitted to a specific folder under “Assessment” tab in Brightspace prior to or on the due date (to be graded; 20% mark-down per day delayed).
- Final Exam (scheduled by RO): 35%

- 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 50% 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.
  - Online Quizzes
    - + Students unable to take the quiz, they must contact the instructor by email prior to the date and time of the quiz 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 quiz will be distributed among the remaining quizzes.
  - 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).
- Online Quizzes
  - + No cooperation is allowed while taking the online quiz and you should not attempt to use external sources to obtain answers for the questions.

- Final Term Project
  - + The project is an individual project that must be completed independently by each student. Plagiarism is a serious academic offence. A finding of plagiarism may result in a failing grade of an assignment or course or, if very serious, suspension or expulsion from the university. See [https://www.dal.ca/dept/university\\_secretariat/academic-integrity/plagiarism-cheating.html](https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html)
  - + Professional editing is not permitted.
  - + URKUND plagiarism detection software would be used in your final paper submission.

### 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: September 16<sup>th</sup>
- Last Day to Drop without “W”: October 3<sup>rd</sup>
- Last Day to Drop with “W”: November 1<sup>st</sup>
- Last Day of course: December 2<sup>nd</sup>
- Fall Study Break: November 7<sup>th</sup>-11<sup>th</sup>
- Online Quizzes: Weekend immediately as soon as the Topic is completed (See schedule)
- Regular Assignments: Due one week after Topic is completed (See schedule)
- Midterm Exam (tentative): October 12<sup>th</sup>
- Project dates due dates:
  - + Proposal: October 21<sup>st</sup>
  - + Preliminary draft due: December 2<sup>nd</sup>
  - + Final paper due: December 8<sup>th</sup>
- Final Exam: Regular exam period (December 9<sup>th</sup>- December 20<sup>th</sup>)

### Email Policy:

Do not expect an immediate reply to your emails. I reserve the right to respond according to the policies outlined below.

- 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:**

<b>Dates</b>	<b>Topic</b>	<b>Material (primary)</b>
<b>Topic 1</b> Weeks 1, 2	<u>Review:</u> Basic Mathematical Tools, Fundamentals of Probability Fundamentals of Mathematical Statistics	Notes, Wooldridge (Ap. A, B, C)
<b>Topic 2</b> Weeks 3, 4	Econometrics and Economic Data Simple Regression Model	Wooldridge (Ch.1, 2)
<b>Topic 3</b> Weeks 5, 7	Multiple Regression Analysis: Estimation Inference	Wooldridge (Ch. 3, 4)
<b>Topic 4</b> Weeks 8, 9	Multiple Regression Analysis: OLS Asymptotic Theory Further Issues Qualitative Information (Binary Variables)	Wooldridge (Ch. 5, 6, 7)

**Week no 10, Study Break: November 7<sup>th</sup> – November 11<sup>th</sup>**

<b>Topic 5</b> Weeks 11, 12	Misspecification: Heteroskedasticity Testing	Notes, Wooldridge (8, 9)
<b>Topic 6</b> Week 13	The Linear Regression Model in Matrix Form Review	Notes, Wooldridge (Adv. Treat. E)

**December 9<sup>th</sup>-December 20<sup>th</sup>: Final Exam**

**Notes:**

 Week 01: Sep 7<sup>th</sup>, Sep 9<sup>th</sup>

 Week 02: Sep 14<sup>th</sup>, Sep 16<sup>th</sup>

 Week 03: Sep 21<sup>st</sup>, Sep 23<sup>rd</sup>

 Week 04: Sep 28<sup>th</sup>

 Week 05: Oct 5<sup>th</sup>, Oct 7<sup>th</sup>

 Week 06: Oct 12<sup>th</sup>, Oct 14<sup>th</sup>

 Week 07: Oct 19<sup>th</sup>, Oct 21<sup>st</sup>

 Week 08: Oct 26<sup>th</sup>, Oct 28<sup>th</sup>

 Week 09: Nov 2<sup>nd</sup>, Nov 4<sup>th</sup>

 Week 10: Nov 7<sup>th</sup> – Nov 11<sup>th</sup>

 Week 11: Nov 16<sup>th</sup>, Nov 18<sup>th</sup>

 Week 12: Nov 23<sup>rd</sup>, Nov 25<sup>th</sup>

 Week 13: Nov 30<sup>th</sup>, Dec 2<sup>nd</sup>

## University Policies and Statements

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

### Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of 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.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.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.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

### 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

**Statement:** <http://www.dal.ca/cultureofrespect.html>

### 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 (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

### Important Dates in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### University Grading Practices

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students 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/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

### Academic supports

**Library:** <https://libraries.dal.ca/>

**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)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

### Other supports and services

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

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

### Safety

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

**Dalhousie COVID-19 information and updates:** <https://www.dal.ca/covid-19-information-and-updates.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.”