

**Faculty of Science Course Syllabus
Department of Economics
Econometrics I, ECON 3338_02
Fall 2020**

Instructor Information:

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Office hours (via Dalhousie MS Teams): Thursday 10:00-11:30 (or by appointment)

Teaching Assistant Information:

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Office hours: TBD

Class Delivery:

- Combined: Synchronous and Asynchronous Components
- Synchronous Components via Collaborate Ultra @Brightspace course page
- Asynchronous Components @ Brightspace course page

Prerequisites:

MATH 1000.03 (or equivalent) and ECON 2280.03/MATH 2080.03/STAT 2080.03, 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:

Due to COVID19 restrictions, face-to-face classes are suspended. Instruction will be online only, and it will be conducted via Dalhousie's Brightspace platform. Nevertheless, the originally allocated days/times will be used as a reference point with respect to the timing of covering different course topics, and assessment elements.

The course will primarily be delivered in an asynchronous manner. Each week of class will respond to a specific topic, and all relevant material such as slides, and videos will be available to you in advance so that you can cover them at your own pace.

There will be seven (7) synchronous sessions (see table below for date/time details) during the term. The synchronous sessions, except for the first one, will serve as review sessions of the material.

It is the students' responsibility to follow the material and review the slides, notes, and videos, but they can do so at their own pace during the week.

Tuesday, September 8 th 2020	10:05am-11:25am (ADT)
Tuesday, September 22 nd 2020	10:05am-11:25am (ADT)
Tuesday, October 6 th 2020	10:05am-11:25am (ADT)
Tuesday, October 20 th 2020	10:05am-11:25am (ADT)
Tuesday, November 3 rd 2020	10:05am-11:25am (AST)
Tuesday, November 24 th 2020	10:05am-11:25am (AST)
Thursday, December 3 rd , 2020	10:05am-11:25am (AST)

The following material will also be provided asynchronously in the form of Panopto video recordings available at the course Brightspace page:

- Theory Lectures
 - Discussion of theory and examples via slides and/or whiteboard.
- Tutorial Problems

- Solution of selected exercises
- Use of statistical software and analysis

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)
 - + MindTap access is required for taking Online Book Assignments.
- 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 16 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:

- Assignments: 34%
 - + Online Assignments (via MindTap): 15%
 - Available when Chapters 2-9 are completed; total of 8 assignments.
 - The weight will be equally distributed among all online assignments.
 - The worst assignment will not count towards the overall grade.
 - + Data Assignments (x4): 15%
 - Data Assignments will consist of computer exercises to test students' ability to practically apply theoretical concepts.
 - The weight will be equally distributed among all data assignments.
 - The worst assignment will not count towards the overall grade.
- Online Quizzes (x3): 30%
 - + Timed Quizzes with focus on testing theoretical concepts. Administered via Brightspace.
- Final Term Project (individual): 20%

- + The choice of topic is at the student's discretion but needs to be approved by the instructor.
- + Specific directions will be provided early in the term concerning:
 - Format
 - Data Sources
 - Expected content
- + It must be handed-in in the lecture on the due date or before.
- **Final Exam: 20%**
 - + The final exam will be a combination of online quiz (via Brightspace) and submission of answers to additional problems.
- Additional Notes:
 - + Assessments deadlines will be communicated to you via: i) announcements in Brightspace, ii) emails, and iii) appropriate entry in the course calendar (Brightspace).
 - + All assessments are individual assessments. Copying is not permitted, and it constitutes a serious academic offence (see Academic Integrity).
 - + Online Assignments (MindTap)
 - + Online Assignments will need to be completed the week after the topic is covered asynchronously (see course schedule).
 - + You will have 3 attempts, with the best attempt counting towards the grade. No time limit to complete the attempts.
 - + Data Assignments
 - + Questions will be posted online at the Brightspace course page.
 - + Online Quizzes
 - + Online quizzes will be delivered via Brightspace. They will be of fixed duration, and they will need to be taken within a specific period on the given date. Students will have a single attempt. Exact time will be determined after consultation with students.
 - 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:

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."

In the event that students are unable to take a quiz or submit a data 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). Note that the SDA can be used twice during the term. The weight of the missed assessment will be equally distributed among the other assessments in the category (e.g. the weight of a missed quiz will be distributed among the other quizzes).

If a student misses the final exam for a valid reason, (Section 16.8 of the University Calendar), she/he must notify the instructor immediately. The student will have the opportunity to write up a make-up exam.

Assessment Due Dates:

Data Assignments	
No 1	October 9 th
No 2	October 30 th
No 3	November 19 th
No 4	December 1 st
Online Quizzes	
No 1	October 8 th
No 2	October 22 nd
No 3	November 17 th
Project	
Proposal	November 6 th
Preliminary draft	December 3 rd
Final paper	Final paper

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

Other Important Dates:

- Last day to withdraw from the course: September 18th
- Last day to withdraw from the course without a “W”: October 2nd
- Last day to withdraw from the course with a “W”: November 2nd
- Fall study break: November 9th-13th
- Final Exam: Regular exam period (December 10th- December 20th)

Email Policy:

Do not expect an immediate reply to your emails. I reserve the right to respond according to the policies outlined below. Note that online teaching does not imply that the instructor is available 24/7:

- Before sending an email with a question, you should first check your course outline, any announcements in Brightspace, or past emails by the instructor.
- Weekdays: I will reply any email that I receive by 19.00 (ADT/AST). After that time, I would only reply emails that I deem them to be urgent. All other emails will be answered the morning of the next day.
- Weekends: I will check my emails but do not expect a reply unless it is about technical problems or questions about assignments.

Online Access:

When connecting to online resources, students are responsible for observing any applicable laws of the country they are connecting from. Students are responsible to establish whether they have access to all course material as soon as the term begins and before the ADD/DROP date. If students do not have access to certain material, they need to inform the instructor as soon as possible.

Alternative access methods are not guaranteed.

Course content/schedule

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

November 9th – November 13th: Study Break

Topic 5 Weeks 10, 11	Misspecification: Heteroskedasticity Testing	Notes, Wooldridge (8, 9)
Topic 6 Week 12	The Linear Regression Model in Matrix Form	Notes, Wooldridge (Adv. Treat. E)

December 10th-December 20th: Final Exam

University Policies and Statements

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

Missed or Late Academic Requirements due to Student Absence

As per Senate decision instructors may not require medical notes of students who must miss an academic requirement, **including the final exam**, for courses offered during fall or winter 2020-21 (until April 30, 2021).

Information on regular policy, including the use of the Student Declaration of Absence can be found here:

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html.

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

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

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

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).

Information: 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

University Grading Practices

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
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
Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
International Centre: 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
Studying for Success: 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
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

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>

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&loaduscredits=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.”