Faculty of Science Course Syllabus
Department of Economics
Econometrics I, ECON 3338 Section 01
Fall 2019
Course CRN 10994
Lab CRN 10996

Instructor:
Kuan Xu
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Timetable:
Lecture Hours:
- Monday/Wed, 8:35-9:55, LSC C332
Tutorial Hours:
- Tuesday/Thursday, 14:35-15:55, Henry Hicks Academic 212
Office Hours:
- Instructor: Monday/Wednesday, 15:00-16:30 (or by appointment)
- Teaching Assistants: Colin Keith and Weiyi Li

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 and associated techniques for analyzing 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 understand its underlying assumptions
- estimate and interpret the parameters of multiple linear regression models
- appreciate the statistical properties of the estimated parameters
conduct hypothesis testing on economic questions based on estimates from multiple regression models
apply the estimated regression model to forecast and 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 test for omitted variables functional form misspecification as well as 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 lectures, tutorials and computer practice sessions.

Material:
- **Required Textbook:**
  + 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 Assignments.

- Additional Notes, as required: available via Brightspace.

Software:
- **Gretl**
  + Gretl is freeware econometric software, which can be downloaded at [http://gretl.sourceforge.net/](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/](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](https://www.rstudio.com/products/rstudio/#Desktop)
STATA
+ STATA is available in McCain Bldg computer labs. You can also purchase an individual licence at a student rate: http://www.stata.com/order/new/edu/gradplans-campus-gradplan/
Note that although a cheaper student version is available, it can only handle a limited number of variables and observations.

There is no restriction on which software you use for computer assignments. Nevertheless, tutorial support will be offered only for the programs listed above.

Assessment:
+ Assignments: 20%
  + Online Assignments (via MindTap): 10%
    ▪ Available when each chapter is completed.
    ▪ The weight will be equally distributed among all online assignments.
    ▪ The worst assignment won’t count towards grade.
  + Biweekly Regular Assignments: 10%
    ▪ Include theoretical derivations and computer exercises.
    ▪ Hardcopy needs to be submitted at the beginning of the class (20% markdown for every hour delayed).
    ▪ The weight will be equally distributed among all regular assignments.
    ▪ The worst assignment won’t count towards grade.
+ Midterm Exam: 20%
+ Final Term Project (individual): 20%
  + Although the choice of topic is in 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
  + It must be handed-in in the lecture on the due date or before.
+ Final Exam: 40%

Notes:
- Assignments
  + Assignments (online and regular) are individual assignments. Copying is not permitted, and it constitutes a serious academic offence (see Academic Integrity).
  + Online Assignments will need to be completed during the weekend; they will become available on Friday afternoon, and they will be due by Monday morning.
  + Regular Assignments will be posted online.
- Exams
  + In the event that you are unable to attend the midterm exam, the student 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), she/he must notify the instructor immediately. The student will have the opportunity to write a make-up exam.

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.
Grading scheme:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>90-100</td>
</tr>
<tr>
<td>A</td>
<td>85-89</td>
</tr>
<tr>
<td>A-</td>
<td>80-84</td>
</tr>
<tr>
<td>B+</td>
<td>77-79</td>
</tr>
<tr>
<td>B</td>
<td>73-76</td>
</tr>
<tr>
<td>B-</td>
<td>70-72</td>
</tr>
<tr>
<td>C+</td>
<td>65-69</td>
</tr>
<tr>
<td>C</td>
<td>60-64</td>
</tr>
<tr>
<td>C-</td>
<td>55-59</td>
</tr>
<tr>
<td>D</td>
<td>50-54</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>

Important Dates (midterm date is tentative):
- Last day to withdraw from the course: September 18th
- Last day to withdraw from the course with a “W”: October 31st
- Midterm Exam (tentative): October 16th
- Project dates due dates:
  + Proposal: November 1st
  + Preliminary draft due: November 29th
  + Final paper due: December 3rd
- Fall study break: November 11th-15th
- Final Exam: Regular exam period (December 5th - December 15th)

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:

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Material (primary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 3</td>
<td>Econometrics and Economic Data, Simple Regression Model</td>
<td>Wooldridge (Ch.1, 2)</td>
</tr>
<tr>
<td>Week 4</td>
<td>Simple Regression Model (cont.)</td>
<td>Wooldridge (Ch. 2)</td>
</tr>
<tr>
<td>Week 5</td>
<td>Multiple Regression Analysis: Estimation</td>
<td>Wooldridge (Ch. 3)</td>
</tr>
<tr>
<td>Week 6</td>
<td>Multiple Regression Analysis: Estimation (cont.)</td>
<td>Wooldridge (Ch. 3)</td>
</tr>
<tr>
<td>Week 7</td>
<td><strong>Midterm Exam (October 15th)</strong></td>
<td>Wooldridge (Ch. 4)</td>
</tr>
<tr>
<td>Week 8</td>
<td>Multiple Regression Analysis: Inference (cont.)</td>
<td>Wooldridge (Ch. 4, 5)</td>
</tr>
<tr>
<td>Week 9</td>
<td>The Linear Regression Model in Matrix Form</td>
<td>Wooldridge (Adv. Treat. E, Ch 6)</td>
</tr>
<tr>
<td>Week 10</td>
<td>Multiple Regression Analysis: Further Issues (cont.)</td>
<td>Wooldridge (Ch. 6, 7)</td>
</tr>
</tbody>
</table>

**Study Break: November 11th-15th**

| Week 11     | Multiple Regression Analysis with Qualitative Information (cont.) Heteroskedasticity | Wooldridge (Ch. 7, 8)        |
| Week 12     | Heteroskedasticity (cont.) Misspecification testing (other)                   | Wooldridge (Ch. 8, 9)       |

**December 5th-December 15th: 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.

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.


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

Missed or Late Academic Requirements due to Student Absence (policy)
https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.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 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

Safety

Research Lab 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.”

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.”