

Dalhousie University
Economics 6534 Section 01
Course CRN: 22691
Advanced Econometrics
Winter 2019

Instructor: Kuan Xu

Time & Location: 1305–1425, Mondays and Wednesdays, Room 2132, Studley MCCAIN ARTS & SS

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- **Course Description:**

This course is designed for graduate students to learn more specialized topics in addition to ECON 5575/5576 Econometrics I/II. During the academic year of 2018–2019, we focus on Time Series Econometrics, which are widely used in economic research. The topics we plan to cover include a mathematical review, R language and packages, univariate time series analysis, vector autoregressive and vector error correction models, structural vector autoregressive models, and Markov switching models.

- **Econometrics Software Packages:**

At Dalhousie University, students have direct access to a variety of statistics and econometrics software packages (commercial and open source software packages).

In the Department of Economics Computer Labs (Basement of 6214 University Ave.), students have direct access to the commercial software packages for mathematics such as **Maple** and for econometrics and statistics such as **MINITAB**, **SAS**, **SPSS**, and **Stata**. Students also have direct access to some open-source software packages for econometrics, and statistics such as **Gretl**, **R**, and **RStudio**.

Students can download and install these open-source software packages in their own computers. One such open-source software package for econometrics is **Gretl**

(see <http://gretl.sourceforge.net/>).

It is completely free and user-friendly. It also has a link to a more advanced open-source software package for statistics/econometrics **R**

(see <http://www.r-project.org/>).

It is also completely free and suitable for doing various kinds of statistics work and data analysis. RStudio is an IDE (integrated development environment), a “shell”, for R. One can download and install RStudio (see <https://www.rstudio.com/>) after R has been installed. RStudio is also free for personal use. Another open-source software package for symbolic mathematics is `xwMaxima`

(see <http://wxmaxima.sourceforge.net>).

It is similar to its commercial counterparts such as `Mathematica` and `Maple` but it is free.

Students are encouraged to learn more than one software packages for their future research and professional careers.

- **Assignments, Exams, and Evaluation:**

(1) There will be four assignments (40%), one research project (30%), and one final exam (30%).

(2) Each assignment will be distributed one week prior to the due date.

(3) The final exam will be an in-class and closed-book exam.

(4) The project should be an empirical research which employs one of the models discussed in the course to address an interesting research question in economics. The evaluation criteria are given in Project Grading Rubric.

Project Grading Rubric

Student Name: _____ B00: _____

Rubric Criteria	Excellent	Good	Competent	Problematic	Score
Knowledge Gap/Topic (max 10 pts)	9 The student identifies a substantial knowledge gap, and the topic is clearly defined.	8 The student identifies a knowledge gap, and the topic is clearly defined.	6 The student identifies a knowledge gap, but under develops it, and the topic is not very clear.	5 Knowledge gap is vague or unclear, as the topic is not properly defined.	
Style; Writing and Structure (max 20 pts)	18 The student follows the style guidelines. Logical organization of facts and ideas with linear reasoning, and effective use of figures/tables. Conclusion summarizes/ integrates/discusses findings.	15 The student mainly follows the style guidelines. Content is organized in sections, but transition between paragraphs is poorly executed; paragraphs mingle too many ideas. Conclusion offers a clear overview of the paper.	12 The student attempts to follow the style guidelines, but the content is not properly organized. Transition between paragraphs is poorly executed; paragraphs mingle too many ideas or repeat the same argument. The conclusion is not very clear.	10 The student does not follow the style guidelines, and has many errors. The content is not organized, and it has no flow. Poor conclusion. The student ignored comments on first draft.	
Motivation (max 10 pts)	9 The motivation is clearly and explicitly stated, and it grabs attention.	8 The student provides a clear and explicit motivation.	6 The student attempts to provide a clear motivation.	5 There is no clear motivation.	
Background and Related Literature (max 10 pts)	9 The student provides a comprehensive and relevant literature review.	8 The student provides a large and relevant literature review.	6 The student attempts to provides a relevant literature review, but either omits important papers or cites irrelevant papers.	5 The student does not provide a proper literature review; incomplete and erroneous.	
Research Design and Analysis (max 50 pts)	44 The analysis is substantial enough for this stage of the research process.	38 Insufficient/weak analysis for this state of the research process.	30 The method is unsuitable to address the research question or the analysis is wrong, and the student ignored comments on first draft.	24 No apparent line of argument.	
Total (maximum 100 points)					

The grading scheme in this course is as follows:

A+	90–100
A	85–89
A–	80–84
B+	77–79
B	73–76
B–	70–72
F	less than 70

• **Textbooks and References:**

1. Helmut Lütkepohl and Markus Krätzig, *Applied Time Series Econometrics*, Cambridge University Press, 2004. (The ebook of this title is available from Dalhousie Library.)
2. Bernhard Pfaff, *Analysis of Integrated and Cointegrated Time Series with R*, Springer, 2008. (This ebook of this title is available from Dalhousie Library.)
3. Walter Zucchini and Iain L. MacDonald, *Hidden Markov Models for Time Series: An Introduction Using R*, CRC Press, 2009. (The ebook of this title is available from Dalhousie Library.)
4. W.N. Venables and B.D. Ripley, *Modern Applied Statistics with S*, Springer, 2002. (The ebook of this title is available from Dalhousie Library.)
5. James D. Hamilton, *Time Series Analysis*, Princeton University Press, 1994. (This is used as a reference.)
6. Lecture slides and other materials will distributed on Brightspace at:
<https://www.dal.ca/brightspace>

Topics and Readings

1. Mathematical Review and Overview
Lütkepohl and Krätzig, Chapter 1
Hamilton, Appendix A Mathematical Review
2. A Brief Introduction to R
Venables and Ripley, Chapters 1–4.
An Introduction to R (a pdf document with R installed)
3. Univariate Time Series Analysis
Lütkepohl and Krätzig, Chapter 2
Pfaff, Chapters 1, 3, and 5

4. Vector Autoregressive and Vector Error Correction Models
Lütkepohl and Krätzig, Chapter 3
Pfaff, Chapters 2.1-2.2, 4, 6, 7 and 8
5. Structural Vector Autoregressive Models
Lütkepohl and Krätzig, Chapter 4
Pfaff, Chapters 2.3
6. Markov Switching Models
Zucchini and MacDonald, Chapters 1-6 and 13

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. See 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). See https://www.dal.ca/campus_life/academic-support/accessibility.html

Code of Student 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. See 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. See <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). See https://www.dal.ca/campus_life/communities/indigenous.html

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

See

https://www.dal.ca/academics/important_dates.html

University Grading Practices:

See

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

Missed or Late Academic Requirements due to Student Absence (policy):

See

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:

See

https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors:

See

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

Indigenous Student Centre:

See

https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre:

See

https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre:

See

https://www.dal.ca/campus_life/international-centre/current-students.html

Academic Supports

Library:

See

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

Writing Centre:

See

https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success:

See

https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office:

See

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

Fair Dealing Guidelines:

See

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

Other Supports and Services

Student Health & Wellness Centre:

See

https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy:

See
<https://dsu.ca/dsas>

Ombudsperson:

See
https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Scent-Free Program:

See
<https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>