

Department of Economics
ECON 5575
Econometrics I
Fall 2018

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Lectures: Monday , Wednesday 11:35 – 12:55 Killam Library 4106

Office hours: Friday 12:30 – 14:15 or by appointment

Course Description

This course is designed to introduce students to commonly used econometric concepts and methods in economic research. It will examine both the classical linear regression model and linear models under more general assumptions (heteroscedasticity, autocorrelation, multicollinearity), with a focus on estimation, inference, and forecasting. It also provides an introduction to asymptotic theory and maximum likelihood approach.

Course Objectives/Learning Outcomes

This course introduces statistical tools for the analysis of economic and financial data. The students registered for the course are expected to have good knowledge of matrix algebra, calculus, probability theory, and statistics.

The students will learn how to

- formulate and discuss the multiple linear regression model and its underlying assumptions;
- derive the Ordinary Least Squares estimators and analyze their statistical properties;
- conduct hypothesis testing of economic questions based on estimates from regression models;
- determine the consequences of multicollinearity, omitted variables, functional form misspecification, autocorrelation and heteroskedasticity in multiple regression models;
- evaluate the adequacy of the estimated regression models by performing specification tests;
- work with generalized least squares;
- derive and apply maximum likelihood estimation and corresponding specification tests.

Course Materials

Required textbook: R. Davidson and J. MacKinnon (2004) "Econometric Theory and Methods", Oxford University Press

Additional reading materials will be distributed in class or posted on Brightspace.

Other useful textbooks:

Greene, W. H. (2012) "Econometric Analysis", Pearson, 7th ed

Wooldridge, J. M. (2010) "Econometric Analysis of Cross Section and Panel Data", MIT press (an earlier edition is on reserve in Killam library)

Software: statistical packages STATA and R (open source). STATA is available in McCain labs (rooms 2018, 2019, 2020, 2022, 2104), Economics labs, and ROWE 3080. Individual student licenses for STATA IC can be purchased through STATA GradPlan

<http://www.stata.com/order/new/edu/gradplans/student-pricing/>

Course Assessment

Component	Weight (% of final grade)	Date
<i>Midterm</i>	30%	24 October, 2018, in class
<i>Final exam</i>	45%	to be scheduled by Registrar
<i>4 assignments</i>	25%	to be determined

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Faculty of Graduate Studies Scale:

A+ (90-100) **A** (85-89) **A-** (80-84) **B+** (77-79) **B** (73-76) **B-** (70-72) **F** (<70)

Course Policies

There will be no make-up midterm exam. If students miss the midterm for health reasons, their final exam will count for 75% of the final grade.

The students are not allowed to collaborate on the assignments.

The full text of Dalhousie's *Policy on Intellectual Honesty and Faculty Discipline Procedures* is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

Course Content

Weeks 1, 2	Probability theory and elements of asymptotic theory (Ch. 1)
Weeks 3, 4	Classical linear regression model: geometry of ordinary least squares (Ch. 2)
Weeks 5, 6	Statistical properties of OLS (Ch. 3)
Weeks 7, 8	Hypothesis testing in linear regression models (Ch. 4, 5)
Week 9	Nonlinear regression (Ch. 6)
Week 10	Generalized least squares (Ch. 7)
Week 11	Maximum likelihood estimation (Ch. 10)
Week 12	Review sessions

Please read the University Policies and Statements on the course website (Brightspace, folder "Course Syllabus").