



Economics 495 (L01)

(Intermediate Econometrics)

Instructor: Daniel V. Gordon
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Lecture Location: ZOOM Delivery
Lecture Days/Time: MWF 12:00-12:50

Office: ZOOM Delivery
Office Hours: MW 2:00-2:50
<https://ucalgary.zoom.us/my/daniel.v.gordon>

Fall 2020

Course Description:

Econometrics combines economic Theory, Statistics and Mathematics. This course will focus on the theory and application of the multi-variate linear regression model in time-series, panel data and limited dependent variable models. The least squares estimator will be the principal tool for estimation, but the maximum likelihood estimator also will be introduced. The course will emphasize the fundamentals of regression models and deal with model specification, identification, estimation and hypothesis testing. Econ 495 starts at a level that assumes familiarity with the material covered in Econ 395, including proficiency at mathematical statistics and some calculus. The use of a standard econometric software package is emphasized. (e.g., excel, gretl, R, Stata) (<http://gretl.sourceforge.net/>)

Course Outcomes:

Students who successfully complete this course will:

- i) Know and understand how to model, estimate and interpret the multi-variable regression model. Have knowledge of identification issues in econometrics and the consequences of endogenous regressors.
- ii) Know and understand the asymptotic properties of a certain class of estimators and test statistics. Be able to technically show the theoretical properties of the least squares estimator when sample size increases and the properties of a consistent estimate. Have knowledge of the limiting distributions on a certain class of estimators and test statistics.
- iii) Know and understand statistical problems arising in time series econometrics. Have knowledge of the fundamental probability characteristics of time series variables. Have knowledge of the consequences of serial correlation in the error structure and procedures for testing and correction.
- iv) Know and understand the problems of nonstationary variables in time series econometrics. Know how to test and correct for unit roots in the distribution of time series variables. Have a working knowledge of error-correction models. Know how to build, estimate and interpret error-correction models.

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v) Know and understand basic modelling issues using panel data structures. Have knowledge of modelling and identification issues in panel data modelling. Have knowledge of the importance of the difference in differences estimator, its modelling and testing.

vi) Know and understand the fixed and random effect estimators. Know the importance of the Hausman test for testing correlation between unobserved heterogeneity and the error term.

vii) Know and understand identification problems in econometrics. Knowledge of the use and interpretation of instrumental variables.

viii) Know and understand the maximum likelihood estimator for estimating linear and non-linear regression equations. Have a knowledge of likelihood ratio tests, Wald statistics and Lagrange multiplier tests, their application and interpretation.

ix) Know and understand modelling and estimating issues as related to limited dependent variable models. Have knowledge of estimating and interpreting logit, probit and a class of ordered and count limited dependent variable models.

x) Know and understand the estimation problems arising from censored and truncated distributions. Have a knowledge of the sample selection problem in econometrics, testing and correction.

Course Outline:

Introduction, review of least squares regression (Chapters 3 &4) Opportunity to review the basic linear regression model.	(4 hrs)
Least squares Asymptotics (Chapter 5) What happens to the theoretical properties of least squares estimates when the sample size increases?	(3 hrs)
Time series econometrics (Chapters 10 &11) Fundamental characteristics and problems in time series econometrics.	(4 hrs)
Further issues in time series econometrics (Chapter 12 & 18) Serial correlation. Heteroskedasticity, Unit Roots, and Error Correction modelling.	(6 hrs)
Introduction to panel data (Chapter 13) Combining independent cross sections, following cross section observations over time, first differencing and policy analysis.	(4 hrs)
Panel data further issues (Chapter 14) Fixed effects, random effects, and dummy variable estimation.	(3 hrs)
Instrumental variables (Chapter 15) The importance of instrumental variables in correcting endogenous RHS variables.	(4 hrs)
Limited dependent variable models (Chapter 17)	

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Maximum likelihood estimation, logit and probit models, censored distribution and truncated regression analysis.

(6 hrs)

Empirical Project (Chapter 19)

Practical issues in defining an econometric problem and carrying out an empirical project.

(3 hrs)

Course Review and final examination preparation

(2 hrs)

Prerequisites/corequisites:

Economics 357, 359 and 395 and 3 units from Mathematics 249,265, or 275

Required Textbook(s):

Jeffrey M. Wooldridge Introductory Econometrics, A modern approach. 7th Edition South-Western 2013
ISBN-13:978-1-111-53104-1

Books on Reserve:

Angrist, J.D. & Pischke, J., Mostly Harmless Econometrics: An Empiricist's Companion

Wooldridge, J.M. Introductory Econometrics: A Modern Approach

Verbeek, M. A Guide to Modern Econometrics

Kleiber, C. & Zeileis, A. Applied Econometrics with R

Studenmund, A.H. Using econometrics: a practical guide

Kennedy, P. A guide to econometrics

Gujarati D. & Porter D. Basic Econometrics

Buse, A. U-statistics, Mm-estimators and resampling

Pearl, J. Causality: models reasoning and inference

Angrist, J.D. & Pischke, J. Mastering metrics

Online Delivery:

This course will be delivered online. Students are expected to be able to participate online in accordance with this Course Outline. Lectures, assignments, office hours, exams, readings and other course material, etc. all require online access and this access is the responsibility of the student.

In order to remotely participate in online courses, students will need to have: computer with a current and updated operating system (macOS or Windows will work with all university-supported online learning technologies), a current and updated web browser installed – the latest versions of Firefox, Safari, Chrome or Edge will help to avoid compatibility issues, secure and reliable internet, microphone / headphones,

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webcam (optional), scanner (or camera to scan your work). Students will be introduced to a number of econometric software packages; excel, gretl, R, Stata.

Desire2Learn:

This course will make use of the Desire2Learn (D2L) platform. Students who are registered in the course can log on at <http://d2l.ucalgary.ca> through their student centre. Please note that D2L features a class e-mail list that may be used to distribute course-related information. These e-mails go to your University of Calgary e-mail addresses only.

Lectures:

Lectures will be delivered online at the Registrar scheduled times and delivered using ZOOM. The lectures will be recorded and posted to D2L.

Labs:

Students are expected to attend virtually the lab presentation. Labs will be offered online, using ZOOM, but can involve moderated discussion boards and curated delivery of alternative online resources. During the labs, the TA will discuss pre-assigned questions and additional material relevant to the course that is not covered in lectures.

Grade Determination and Final Examination Details:

Best 4/5 Quizzes @ 5%	20%
4 Lab Exercises @ 10%	40%
Final Examination	40%
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	100%

The official grading system will be used. See <http://www.ucalgary.ca/pubs/calendar/current/f-1-1.html>.

Quizzes may be a combination of multiple-choice, fill-in-blank and short-answer questions completed online. Quizzes are designed to be completed in 20 minutes, but students will have 30 minutes to complete each quiz, at a time of their choosing, within a 24-hour period determined by the instructor.

A passing grade on any particular component of the course is not required for a student to pass the course as a whole.

If a student's letter grade on the final exam exceeds their aggregate quiz letter grade, the weight of the aggregate quiz grade may be transferred to the final exam at the discretion of the instructor. The student must have written 4/5 quizzes or provided supporting documentation for the absence(s) such as a medical note or statutory declaration.

As per the Writing Across the Curriculum Statement in the Calendar, writing and grading thereof will be a factor in the evaluation of student work. See <https://www.ucalgary.ca/pubs/calendar/current/e-2.html>.

The final examination will be comprehensive and scheduled by the Registrar. Students will download the exam from D2L, complete the exam, scan it, and submit using Dropbox in D2L. Student will have 50% more time to complete the exam, at a time of their choosing, within the 24-hour period that begins 24

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hours before the end date of the Registrar's scheduled final exam for this course. The exam is designed to be completed in two hours.

All other course components will also be accessed, submitted, and returned through D2L.

If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam <https://www.ucalgary.ca/pubs/calendar/current/g-6.html>. Under no circumstance will this be accommodated by the Department.

THERE WILL BE NO MAKEUP OR DEFERRED QUIZZES/TESTS/EXAMS under any circumstances, nor may the quizzes/tests/exams be written early. Students unable to write the quizzes/tests/exams because of documented illness, family emergency, religious observance, or university-sanctioned event will have the weight shifted to the final examination; otherwise a grade of zero will be assigned.

Reappraisal of Grades and Intellectual Honesty:

For Reappraisal of Graded Term Work, see Calendar 1.2

<http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

For Reappraisal of Final Grade, see Calendar 1.3

<http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

ACADEMIC MISCONDUCT

Academic Misconduct refers to student behaviour that compromises proper assessment of students' academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

Student committing academic misconduct during the final exam will not receive a passing grade on the course.

For information on the Student Academic Misconduct Policy and Procedure please visit:

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Additional information is available on the Academic Integrity Website at <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

Recording of Lectures:

Recording of lectures is prohibited, except for audio recordings authorized as an accommodation by SAS or an audio recording for individual private study and only with the written permission of the instructor. Any unauthorized electronic or mechanical recording of lectures, their transcription, copying, or distribution, constitutes academic misconduct. See <https://www.ucalgary.ca/pubs/calendar/current/e-6.html>.

Academic Accommodations:

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services. SAS will process the request and issue letters of accommodation to instructors. Students who require an accommodation in relation to their coursework based on a protected ground

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other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

Freedom of Information and Protection of Privacy (FOIP) Act:

Personal information is collected in accordance with FOIP. Assignments can only be returned to the student and will be accessible only to authorized faculty and staff. For more information, see <http://www.ucalgary.ca/legalservices/files/legalservices/faq-students.pdf> and http://www.ucalgary.ca/legalservices/files/legalservices/faq-faculty_0.pdf.

Copyright Legislation:

See the University of Calgary policy on Acceptable Use of Material Protected by Copyright at www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf. Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

Important Dates:

Please check: <http://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html>.

Student Organizations:

Faculty of Arts Students' Association (F.A.S.A.):

Economics Department Representative

E-mail: econrep@fasaucalgary.ca and Web: www.fasaucalgary.ca.

Society of Undergraduates in Economics:

<https://www.ucalgarysue.com/>.

Society of Undergraduates in Economics is a student run organization whose main purpose is to assist undergraduate economics students to succeed both academically and socially at the University of Calgary. Services include access to the exam bank, career events such as Industry Night and information sessions, mentorship programs, and social events for members. They invite you to join by contacting SUE at societyofundergradsineconomics@gmail.com.

Faculty of Arts Program Advising and Student Information Resources:

- Have a question, but not sure where to start? The Arts Students' Centre is your information resource for everything in Arts! Call them at 403-220-3580, or email them at artsads@ucalgary.ca. You can also visit the Faculty of Arts website at <http://arts.ucalgary.ca/undergraduate>, which has detailed information on common academic concerns, including program planning and advice.
- For registration (add/drop/swap), paying fees and assistance with your Student Centre, contact Enrolment Services at 403-210-ROCK [7625].

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Student Support and Resources:

- See <https://www.ucalgary.ca/registrar/registration/course-outlines> for information on campus mental health resources, the Student Ombuds' Office, Student Success Centre, Safewalk, and Emergency Evacuation and Assembly.
- Online writing resources are available at <https://ucalgary.ca/student-services/student-success/writing-support>.

Notes:

1. Students are responsible for all assigned material, e.g., supplementary material posted on D2L, regardless of whether or not the material was covered in class.

DVG

2020-08-06