UNIVERSITY OF CALGARY

Department of Economics
Faculty of Arts

Economics395 (L01) Use of Statistics In Economics

Instructor: Arvind Magesan
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Office: ZOOM Delivery
Office Hours: M 9:00

Lecture Location: ZOOM Delivery
Lecture Days/Time: TR 12:00-14:15

Summer 2021

Course Description:
Introduction to the use of econometric principles in economics. Building on the fundamental mechanics of statistics and probability, students will become familiar with the empirical application of econometrics to problems of measurement in economics. The course focuses on statistical reasoning, the gathering and manipulation of economic data, and the use of standard econometric software. The core of this course is based on the principles from random variables, expectation theory, and probability theory. The two-variable and multivariate linear regression models are introduced, developed and evaluated. The overriding purpose of the course is to provide the student with a strong intuitive understanding of how and why econometrics works and the empirical applications to support and strengthen this understanding.

Course Learning Outcomes:
Students who successfully complete this course will:

- Know and understand the Simple Linear Regression Model. Be able to transform a simple linear economic model to an econometric model – the role of the error term. Know the assumptions of the simple linear regression model and why we need them.
- Have an intuitive understanding of the Gauss Markov Theorem
- Know the sampling properties of the Least Squares Estimators- expected value, variance.
- Interval estimation and hypothesis testing for the least squares estimator.
- Understand the purpose and importance of a multi-variable regression model.
- Know how to carry out hypotheses testing and model evaluation in a multi-variable setting.
- Model specification and testing.
- Understand the serious problems of heteroskedasticity and methods for correction.
- Understand the importance and use of binary variables. A quantitative measure for a qualitative factor.
- Understand the linear probability model and applications.
- Model Specification: Issues arising in empirical application of regression models, testing functional specification.
- Understand proxy variables, functional form and model specification.

- Have a knowledge of the use of econometric software (Stata and/or Python) in generating empirical estimates

Course Outline:

Section 1:

1. Introduction to Econometrics: Why study econometrics and why it is useful for understanding economic problems and issues of measurement. Chapter 1
2. Review of basic probability and statistics. Appendices A, B, C
3. Introduction to Python for econometrics.

Section 2:

4. Simple Regression Model: Fundamental characteristics and mechanics of regression analysis, the importance of the residual error term. Chapter 2
5. Python for regression analysis.
6. Multiple Regression Models – Estimation: A detailed understanding of why and what restrictions are required for a regression equation to generate empirically accurate information on the relationships among economic variables. Chapter 3
7. Multiple Regression Models – Inference: Testing the statistical accuracy of the model and parameter estimates. Chapter 4
8. Multiple Regression Models – Further Issues: Issues of functional form for specifying the regression model, selection of regressors, and using the estimated regression model for prediction. Chapter 6
9. Qualitative Information in the Regression: The importance and use of binary (dummy) variables as regressors and choice variables. The linear probability model in economics is introduced. Chapter 7

Section 3:

10. Heteroskedasticity: The variance of the regression equation and the importance of constant variance (homoscedasticity) in economic inference and model valuation, tests and corrections. Chapter 8
11. Model Specification: Issues arising in empirical application of regression models, testing functional specification, proxy variables and measurement error. Chapter 9

Section 4:

12. Course Review and Final Exam Preparation

Prerequisites/corequisites:
Economics 201, 203 and Statistics 213 and 217

Required Textbook(s):
Jeffrey M. Wooldridge Introductory Econometrics, A modern approach. 5th Edition South-Western2013
ISBN-13:978-1-111-53104-1

Recommended Textbook(s):
Joshua Angrist and Jorn Steffen Pischke. Mastering Metrics: The Path from Cause to Effect.
James Stock and Mark Watson. Introduction to Econometrics.

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, webcam (optional), scanner (or camera to scan your work. You will need access to Stata and Python. Stata is available through the computing lab at the University, while Python is free for download online.

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 subsequently posted to D2L.

Tutorials:
Students are expected to attend “virtually” the tutorial sections to which they have been assigned. Tutorials will be offered online, typically using ZOOM, but can involve moderated discussion boards and curated delivery of alternative online resources. During the tutorials, 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 (dates subject to change):

Assignment 2 July 28th 11:59pm 10% Assignment 3 August 11th 11:59pm 10% Midterm exam July 30th 2:45pm 30% Final Exam TBD by registrar office 40% 100%

Assignment 1 (July 14, 11:59pm)	10%
Assignment 2 (July 28, 11:59pm)	10%
Assignment 3 (August 11, 11:59pm)	10%
Midterm Exam (July 29, in class)	30%
	40%
Final Exam (Registrar)	
	100%

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

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 midterm(s) letter grade, the weight of the midterm(s) may be transferred to the final exam at the discretion of the instructor. The student must have written the midterm(s) 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.

Course material dealing with a particular assignment will typically be covered in class at least 1 day before the assignment is due; thus, assignments can be completed at any time up to and including the due date. Given these factors, only situations where someone can document illness or domestic affliction for an extended period would possibly warrant shifting the assignment weight to the final exam. Furthermore, technical problems can be expected to occur with computer systems (and internet availability) so it may be a good idea to not wait until the last minute to submit your assignment.

The midterm exam(s) is take-home exam(s) designed and intended to be completed in 75 minutes. The exam(s) will be OPEN book. The exam(s) will be available on D2L. Student will download the exam from D2L, complete the exam, scan it, and submit using Dropbox in D2L. Student will have 50% time extension to complete the exam, at a time of your choosing, within a 24-hour period determined by the instructor.

The final examination will be take-home, 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 hours before the end date of the Registrar's scheduled final exam for this course. The exam is designed and intended to be completed in two hours. The exam will be OPEN book.

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.

Tests and exams WILL NOT involve multiple choice questions and / or fill-in-blank questions.

The exact date for the in-class midterm(s) will be announced at least one week in advance.

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

For Reappraisal of Final Grade, see Calendar I.3
http://www.ucalgary.ca/pubs/calendar/current/i-3.html

ACADEMIC MISCONDUCT
Academic Misconduct refers to student behavior 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 for the course.

For information on the Student Academic Misconduct Policy, Procedure and Academic Integrity, please visit: https://www.ucalgary.ca/pubs/calendar/current/k-3.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 other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at
https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure

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 https://www.ucalgary.ca/legal-services/access-information-privacy

Copyright Legislation:
See the University of Calgary policy on Acceptable Use of Material Protected by Copyright at https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy 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.

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.

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].

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.

ANM
2021-05-07