

## Economics 395(L01) (Introduction to Econometrics)

Instructor:	Wenshuang Yu	Lecture Location:	EDC 280
Email:	<a href="mailto:wenshuang.yu@ucalgary.ca">wenshuang.yu@ucalgary.ca</a>	Lecture Days/Time:	MW 12:00 - 14:45
Office:	SS 415	Lab Location:	SS 018
Office Hours:	MW 15:30 – 16:30 or by appointment	Lab Days/Time:	MW 08:00-08:50
		Spring 2023	

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### 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 Objectives/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 (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

**Section 2:**

1. Simple Regression Model: *Fundamental characteristics and mechanics of regression analysis, the importance of the residual error term*. Chapter 2
2. 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
3. Multiple Regression Models – Inference: *Testing the statistical accuracy of the model and parameter estimates*. Chapter 4
4. 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
5. 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:**

1. 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
2. Model Specification: *Issues arising in empirical application of regression models, testing functional specification, proxy variables and measurement error*. Chapter 9

**Section 4:**

1. Course Review and Final Exam Preparation

**Prerequisites/corequisites:**

Economics 201 and 203 and Statistics 213 and 217

**Required Textbook(s):**

Jeffrey M. Wooldridge. 2018. *Introductory Econometrics, A Modern Approach*. 7<sup>th</sup> Edition, South-Western.

Florian Heiss and Daniel Brunner: *Using Python for Introductory Econometrics*.

**Recommended Textbook(s):**

Stock and Watson. *Introduction to Econometrics*, 4<sup>th</sup> Edition.

Joshua D. Angrist and Jörn-Steffen Pischke. 2105. Mastering 'Metrics, The Path from Cause to Effect. Princeton University Press.

**Books on Reserve:**

The list of reserve titles, if any, is posted at the course D2L site.

**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.

**Lab/Tutorials:**

Students are expected to attend the tutorial sections to which they have been assigned. 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:**

<b>ASSIGNMENTS</b>	<b>Due Date</b>	30%
ASSIGNMENT 1	May 15 <sup>th</sup>	
ASSIGNMENT 2	May 29 <sup>st</sup>	
ASSIGNMENT 3	June 12 <sup>th</sup>	
<b>MIDTERM EXAM</b>	May 31 <sup>rd</sup>	30%
<b>FINAL EXAMINATION</b>	TBA	40%
		100%

**Examination Details:**

Tests and exams WILL NOT involve multiple choice questions.

Programmable calculators, cellphones, textbooks, course notes, and other electronic devices will not be allowed during the writing of tests or final examinations. Students are reminded that simply being able to access their cellphone during an exam is academic misconduct.

The midterm will be written in class time on May 31<sup>st</sup>.

**Grading Policies:**

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

Students must receive a passing grade on the final exam to pass the course. Students committing academic misconduct during the final exam will not receive a passing grade for the course.

If a student's letter grade on the final exam exceeds their midterm(s) letter grade, the weight of the midterm(s) is (are) transferred to the final exam. The student must have written the midterm(s) or

provided supporting documentation for the absence(s). For Spring 2023 the University has suspended the requirement for supporting documentation. Instructors cannot currently ask students for documentation to support absences.

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](https://www.ucalgary.ca/pubs/calendar/current/e-2.html).

Any student work which remains undistributed after the last day of classes will be available to students through the instructor's office during the instructor's office hours.

The final examination will be comprehensive, scheduled by the Registrar, held in a classroom, and last 2 hours. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred <https://www.ucalgary.ca/pubs/calendar/current/g-3-4.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:**

*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 and Intellectual Honesty:**

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.

*Statement on Academic Integrity, see Calendar K.4*

<https://www.ucalgary.ca/pubs/calendar/current/k-3.html>

*Plagiarism and Other Academic Misconduct*

<https://ucalgary.ca/student-services/student-success/learning/academic-integrity>

**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 policies on Student Accommodations are available at <https://www.ucalgary.ca/legal->

[services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf](#) and <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/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 <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/faq-privacy-faculty-members.pdf> and <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/faq-privacy-students.pdf>

**Internet and Electronic Communication Device information:**

The use of cell phones for any purpose in class is prohibited. Computers and tablets may be used for note taking only unless otherwise authorized by the instructor.

**Copyright Legislation:**

See the University of Calgary policy on Acceptable Use of Material Protected by Copyright at <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Acceptable-Use-of-Material-Protected-by-Copyright-Policy.pdf>. Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

**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>.

**Instructor Intellectual Property:**

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

Office: SS 803, E-mail: [econrep@fasaucalgary.ca](mailto:econrep@fasaucalgary.ca) and Web: [www.fasaucalgary.ca](http://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 [sue@ucalgarysue.com](mailto:sue@ucalgarysue.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! Drop in at SS102, call them at 403-220-3580, or email them at [artsads@ucalgary.ca](mailto: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] or visit them in the MacKimmie Library Block.

**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.

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2023-04-14