

## Economics 497(L01) Econometrics II

Instructor: Alexander Whalley  
Phone: (403) 220-7143  
Email: [alexander.whalley@ucalgary.ca](mailto:alexander.whalley@ucalgary.ca)

Lecture Location: ES 54  
Lecture Days/Time: Tuesday/Thursday 11-12:15

Office: SS 406  
Office Hours: 1-3pm Tuesday

Teaching Assistant: Anuj Sharma  
Email: [anuj.sharma1@ucalgary.ca](mailto:anuj.sharma1@ucalgary.ca)

Office: SS 345  
Office Hours: 9-11am Thursday

Winter2020

---

### Course Description:

The purpose of this course is to advance students understanding of theoretical and applied issues in econometrics. Providing students with a strong foundation to carry through with graduate level study in econometrics and learn the skills sought after in the business community. The course takes a broad approach to topics covered but will also focus on current exciting econometric issues. Students are expected to have working knowledge of some econometric software. We will also discuss prediction and classification models that are used in Data Science. By the end of the class students will have extensive experience in applying different data analysis methods, and in using experimental and nonexperimental research designs to make inferences.

### Course Objectives/Learning Outcomes:

The primary objective of the course is to provide students with an in depth theoretical and practical knowledge in advanced econometrics. Besides focusing on econometric theory, students will also have 'hands-on' experience communicating how advanced econometrics concepts are applied in academic and business settings.

### Course Outline:

1. Introduction - review of statistics; confidence in intervals; power analysis
2. Inference in a randomized controlled trial (RCT) setting; experimental design; noncompliance and other problems of inference;
3. Linear regression modeling; properties of regression; omitted variables; decomposition techniques; problems of inference
4. Fixed effects; random effects; correlated random effects models
5. Non-experimental research designs I: difference in differences
6. Matching and reweighting – alternatives to regression

7. Non-experimental research designs II: instrumental variables
8. Non-experimental research designs III: regression discontinuity
9. Nonlinear models: multinomial models; logit and related models
10. Prediction, classification and regularization
12. Bootstrap and Cross-Validation
13. Forecasting (time permitting)

**Prerequisites/corequisites:**

Econ 497 starts at a level that assumes familiarity with the material covered in Econ 495 and Stats 213, including proficiency at mathematical statistics and calculus. Presentations will use matrix algebra. Computers in the Tri-Faculty computer lab (SS018) are equipped with STATA software.

**Required Textbook(s):**

Angrist, J.D. and Pischke, J., *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani. *An Introduction to Statistical Learning with Applications in R* (ISLR). This book is available for free at <http://www-bcf.usc.edu/~gareth/ISL/> : this site also other useful related materials.

**Recommended Textbook(s):**

Wooldridge, J.M., *Introductory Econometrics: A Modern Approach*, South-Western.

Kennedy, Peter, *A Guide to Econometrics*, 6<sup>th</sup> Edition, Blackwell Publishing.

**Books on Reserve:**

Morris H. DeGroot, Mark J. Schervish *Probability and Statistics*, Pearson/2010/4th Edition Hardcover

**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.

**Grade Determination and Final Examination Details:**

MIDTERM EXAM	30%
FINAL EXAMINATION	40%
PRESENTATIONS (1)	20%
ASSIGNMENTS (3)	10%
	<hr/>
	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.

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.

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 an open-book, take-home exam. The exam will be available on D2L 24 hours before the end of the Registrar's scheduled final exam time. Students will hand in their exam in pdf format on D2L prior to the end of the scheduled completion time of their final exam using DropBox and also by email to the professor ([alexander.whalley@ucalgary.ca](mailto:alexander.whalley@ucalgary.ca)). If a student cannot write their final exam during this interval, they need to apply for a deferred exam at [www.ucalgary.ca/registrar/exams/deferred final](http://www.ucalgary.ca/registrar/exams/deferred_final). Under no circumstance will this be accommodated by the Department.

Tests and exams will not involve multiple choice questions. Non-programmable calculators WILL be allowed during the writing of tests or final examinations.

The exact date for the in-class midterm 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.

#### **Grade Determination and Final Examination online delivery changes:**

- (1) The presentation component will only cover the first presentation that was completed before moving to online delivery. The second presentation scheduled to being the first week of online instruction will not take place and will not count for assessment. All grades for the presentation component will be based on the first presentation.
- (2) The final exam will be a remote exam that students submit to the professor virtually. This exam will be scheduled after the class is completed in accordance with the Economics department schedule. The exam will be open book and cover all of the material in the course.

#### **Important Dates:**

##### **Midterm Exam: February 13<sup>th</sup> 2020**

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

#### **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>

*Statement of Intellectual Dishonesty, see Calendar K.4*

<http://www.ucalgary.ca/pubs/calendar/current/k-4.html>

*Plagiarism and Other Academic Misconduct, see Calendar K.5*

<http://www.ucalgary.ca/pubs/calendar/current/k-5.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 <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](http://www.ucalgary.ca/legalservices/files/legalservices/faq-faculty_0.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 [www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://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.

**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

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 [societyofundergradsineconomics@gmail.com](mailto: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! 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>.

AW

2018-12-05