

## Economics 395 (L02) (Use of Statistics in Economics)

Instructor: Atsuko Tanaka  
Phone: 403-220-6709  
Email: atanaka@ucalgary.ca

Lecture Location: SA 121  
Lecture Days/Time: TR 11:00-12:15

Office: SS 432  
Office Hours: Thursday 15:20-16:20

Winter 2020

### Course Description:

Introduction to the use of statistical principles in economics. Topics include gathering economic data, basic data manipulation, hypothesis testing, and statistical estimation of economic relationships. 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.

### Course Learning Outcomes:

Building on the fundamental mechanics of statistics and probability as presented in Stats 205, 211 or 213, Econ 395 students will become familiar with the empirical application of statistical principles to problems of measurement in economics. The course focuses on the intuition and application of statistical reasoning, the gathering and manipulation of economic data, and the use of standard econometric software. Students completing this course successfully will have a fundamental working knowledge of statistics and econometrics as applied to solving current economic problems and measurement.

### Course Outline:

Week	Topic	Readings	Notes
1	Introduction: Why study econometrics? Why it is useful for understanding economic problems and issues of measurement.	Wooldridge Ch. 1	
2, 3	Review of basic probability and statistics: Opportunity to review important elements in Statistics useful	Wooldridge Appendices A, B, C; Review Stats 213	
<u>** 3</u>	<u>Assignment #1 due</u>		<u>Jan. 24</u>
4	Simple Regression model: Fundamental characteristics and mechanics of regression analysis, the importance of the residual error term.	Wooldridge Ch. 2	

5, 6	Multi-regression Model: 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.	Wooldridge Ch. 3	
<u>** 5</u>	<u>Assignment #2 due</u>		<u>Feb. 7</u>
6, 7	Multi-regression inference: Testing the statistical accuracy of the model and parameter estimates.	Wooldridge Ch. 4	
<u>**6</u>	<u>MIDTERM 1</u>	<u>Wooldridge Chapters 1 – 3, Appendix A, B, C</u>	<u>Thu, Feb. 13</u>
<u>7</u>	Mid-term Break		<u>Feb 16-22</u>
<u>** 8</u>	<u>Assignment #3 due</u>		<u>Feb. 28</u>
8,9	Multi-regression further issues: Issues of functional form for specifying the regression model, selection of regressors, and using the estimated regression model for prediction.	Wooldridge Ch. 6	
<u>**10</u>	<u>MIDTERM 2</u>	<u>Wooldridge Chapters 4 - 6</u>	<u>Thu, Mar. 12</u>
10,11	Qualitative information: The importance and use of binary (dummy) variables as regressors and choice variables. The linear probability model in economics is introduced.	Wooldridge Ch. 7	
<u>** 12</u>	<u>Assignment #4 due (Effective on March 16: <b>No need to answer Stata questions</b>)</u>		<u>Mar. 27</u>
12,13	Heteroskedasticity: The variance of the regression equation and the importance of constant variance (homoscedasticity) in economic inference and model valuation, tests and corrections.	Wooldridge Ch. 8	
13,14	Model Specification: Issues arising in empirical application of regression models, testing functional specification, proxy variables and measurement error.	Wooldridge Ch. 9	
14	Course Review and Final Examination Preparation		
<u>** 14</u>	<u>Assignment #5 due</u>		<u>Apr. 10</u>
	A <b>cumulative</b> final examination scheduled by the Registrar's Office	<u>Wooldridge Chapters 1 – 4, 6– 9, Appendix A, B, C</u>	

**Prerequisites/corequisites:**

Economics 201, Economics 203, Statistics 205, 211 or 213

**Required Textbook(s):**

Jeffrey M. Wooldridge *Introductory Econometrics, A modern approach*. 7<sup>th</sup> Edition, South-Western

**Recommended Textbook(s):**

Keller. *Statistics for Management and Economics*, 8<sup>th</sup> Edition.

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

**Books on Reserve:**

Adkins and Hill. *Using Stata for Principles of Econometrics*, 3rd Edition.

A. Colin Cameron & Pravin K. Trivedi, *Microeconometrics using Stata*, Revised Edition, Stata Press

Angrist, Joshua D. and Jörn-Steffen Pischke. *Mostly Harmless Econometrics: An Empiricist's Companion*

Hill, Griffith, and Lim. *Principles of Econometrics*, 3rd Edition.

**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.

**Laboratory:**

Quantitative analysis using standard statistical software; Stata (or another programming language such as Excel and R).

Students are expected to attend the weekly tutorial section to which they have been assigned.

**LAB 2 W17:00-17:50 at Social Science 020****Grade Determination and Final Examination Details:**

2 MIDTERM EXAMS	40% (2@20%)
FINAL EXAMINATION	35%
5 ASSIGNMENTS	25% (5@5%)
	<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.

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) 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](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 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. 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.

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.

For the dates for the in-class midterms, see the course outline section.

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>

*Statement of Intellectual Honesty, 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>.

**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.
2. **Email your TA first.** Your TA will forward your email to me. If you have urgent questions or concerns, email your TA by CCing me.
3. The final exam is harder than the midterm exams. Try not to miss the midterm exams.
4. Submit your assignments to **the D2L Dropbox** before the due.
5. Late assignments, assignments sent by e-mail, placed in my mailbox or placed under my office door will not be accepted.
6. You are encouraged to work with your classmates. However, you need to write in your own words.
7. Assignments Formatting Requirements:
  - Submit your assignments as ONE file unless specified otherwise. **Compressed folders (e.g. .zip or .pages) do not count as single files.** If you are uploading photos of your work, please transform them into a format recognized by Windows (e.g. JPEG, PNG or PDF format). *Please do not submit files with .heic extension.*
  - Include your family name and the assignment number in the name of the file you upload to Dropbox in the following form: LASTNAME\_hw# where you will substitute the assignment number for the # in the filename.
  - You can scan your written homework with a scanner or your device's camera to create scanned pdf files. Before you submit your scanned homework be sure to verify that the scan is easily readable.
  - Make sure that the pages are in the correct order; that is, the first page of the document should be the first page of your work and so on. Make sure that the pages are aligned properly; that is, pages are not in a landscape position.
  - I recommend that you submit a draft at least one day before the due. If you want to make a change, you can upload the whole file as a new submission in the same folder---**your grade will be based on the most recent submission.**

AT

2019-11-26

**Changes (Effective on Thursday, March 19):**

- The Department of Economics decided that we should not be meeting with students on campus for any reason, nor should students be meeting with each other in a face-to-face format. All contact should be moved to virtual channels.
  - There will be no one-on-one performance instruction.
  - No lab sessions.
- The main interaction is through office hours by online communication tools.
  - I will post announcements on D2L Newsfeed. If announcements are important/urgent, I will also email you using the class mail-list.
  - I will mainly use D2L Discussion Forum for Q&A and open discussion.
  - My office hours take place in the regular hours and TBA using emails, Skype, Google and the Discussion Forum on D2L. Send me an email in advance to choose an appointment time and a communication tool used for discussion.
- Please read any emails coming from myself (the instructor; [atanaka@ucalgary.ca](mailto:atanaka@ucalgary.ca)) or the TA ([zahra.espanani@ucalgary.ca](mailto:zahra.espanani@ucalgary.ca)). Please reach out to us with any questions you have. Also let us know if you do not have access to D2L at earliest convenience.

**Classes**

- All the class material will be posted to D2L so that students who are not able to attend the lecture still have access to the material.
- The material covered in each lecture (after March 19) will be all found in one D2L Folder named under “Lecture#\_Date” (e.g. Lecture1\_Mar19 will contain all the materials covered on March 19) for easy search.
- Before each lecture, I post reading material and associated quizzes (starting on March 19) and discuss over the material on D2L Discussion Forum.  
The reading material contains
  - summary of lecture (in written format)
  - review questions on TopHat (the review question will NOT be graded, but will help the students to understand the material discussed in the lecture note and prepare for the questions asked in the final exam. The answer keys will be provided within a week after the initial post)
- Q&A: During the class time, the students are asked to post their questions on D2L discussion forum to receive immediate response from the instructor and/or the TA.
- Review: At the end of each (textbook) Chapter, I provide a review note that summarize what we learned from the chapter.

**Assignments**

- No STATA/R/EXCEL questions will be asked in the rest of the assignments. I remove the remaining questions involved with Stata software from Assignments 4; a revised version of Assignment 4 will be posted soon.

**Final Exam**

- The final exam is an **open-book take-home** exam.
- You have **24 hours** to complete the exam before the submission deadline. The exam contains the same volume of questions as a two-hour closed-book final exam. Most students should be able to solve all the questions within 2 hours.
- The submission deadline is **the end time of the Registrar’s scheduled exam time.**
- Study Guide:
  - Practice Final Exam: Practice questions for the final exam will become available (posted on D2L) two weeks before the scheduled final exam.
- On the exam day:

- 1) download the exam from D2L (the PDF file (along with the formula sheets and tables) will be uploaded in "**final exam**" folder 24 hours before the end time)
- 2) **hand-write** your answers on a piece of paper (iPad/tablet is OK).
- 3) the exam time is 2 hours.
- 4) Scan your answers (you can take a photo) and upload them into the Dropbox folder ("**Final exam submission**"). Make sure all the files are legible.
- 5) **submit your files before the D2L Dropbox folder closes. The folder will close at the end time** of the exam. The most recent submission will be graded (i.e. you can submit multiple times).
- You will get 1 extra credit if you submit your answers to the specified D2L Dropbox on time; you will get no extra credit if you submit them by email. If you have a problem with the system or you have no access to technology, send your answers to me and Zahra by email at [atanaka@ucalgary.ca](mailto:atanaka@ucalgary.ca) and [zahra.espanani@ucalgary.ca](mailto:zahra.espanani@ucalgary.ca).
- If you know that you will not have access to the D2L Dropbox on the exam date, please email me and Zahra two days before the exam. With advance notice, you will receive 1 extra credit regardless you submit by email or to the Dropbox folder.
- **No late submission will be accepted.** If we do not **receive** your submission in time, you will receive no credit for the final exam.
- **Warning:** This is a take-home exam. Please solve the questions by yourself. No discussion will be allowed. If we find the same answers and the same mistakes, the students are suspected to have cheated. Both students will receive 0, regardless of who helped who.

#### **Other Support**

- I will ask the TA to actively help the students to learn the course material using emails and other online communication tools. I will also ask him to share helpful resources for self-learning the material.
- Our PASS leader holds PASS sessions using ZOOM. The information is posted on D2L.

#### **Disclaimer**

- These arrangements are subject to change. I will adjust and improve the delivery as I experiment with the online course. I will post the changes on D2L and email to the class mailing list when I make important/major changes.

#### **Other Notes**

- Please understand that things are changing rapidly, and the proposed plans may need to be adjusted or abandoned should circumstances change.
- The primary goals are your health and safety, followed by trying to finish the semester with the best possible learning outcomes under the circumstances.

AT

2020-03-16