

## Economics 615 (Advanced Econometrics I)

Instructor:	Pamela Campa	Lecture Location:	KNB 133
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Office Hours:	R 9:00 – 11:00 am, by appointment	Winter 2015	

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### What is this course about?

This course is intended to provide a foundation of econometric theory relevant for carrying out empirical work in economics. We will survey theory and applications of methods of data analysis developed for micro data. We will mostly focus on the analysis of cross-sectional data, and we will introduce some panel data techniques only if time allows. We will review the linear regression model, and then we will study estimation methods for non-linear models. We will focus on the most commonly used non-linear models, and we will also study numerical methods, which are useful when we depart from standard models, and a closed-form solution for the non-linear estimator does not exist.

I assume that the student taking this course has taken mathematical statistics or econometrics at the undergraduate level, a course in linear algebra, and a course in multivariate calculus. Linear algebra and multivariate calculus will be used frequently.

During our first class I will distribute a handout that recaps some basic notions of linear algebra and calculus. Your knowledge of these notions, together with the material covered in the first weeks of the course, will be tested in the first problem set.

### Textbook(s):

A. Colin Cameron and Pravin K. Trivedi. *Microeconometrics: Methods and Applications* (Cambridge University Press, 2005)

The textbook is intended as the main reading for the course. Although in the outline I will refer to entire chapters of the textbook, sometimes you will be required to read only portions of each chapter, the selection of which will be made clear during the respective class. For specific topics I will also use the following textbooks:

Angrist, J., and S. Pischke. *Mostly Harmless Econometrics* (Princeton University Press, 2008)

Although this book is a “must have” for anybody interested in working with cross-sectional and panel data to identify causal relationships, it is not required for this course; we will work on very limited sections of the book, which will be available in PDF on Blackboard.

Kenneth Train, *Discrete Choice Methods with Simulation*, available here:  
<http://elsa.berkeley.edu/books/choice2.html>

In addition, we will occasionally discuss in class research papers. These papers are marked with one asterisk in the list below, which means that they are supplemental materials. You can be tested for the portion of these readings that is included in the lecture slides. The list may change throughout the term, in which case I will make an announcement. All the readings and the lectures slides will be available in PDF on Blackboard, unless otherwise noted.

Another text that you might find useful is:

Wooldridge, *Econometric Analysis of Cross Section and Panel Data*. (MIT Press)

### **Book(s) on Reserve:**

**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> using or through their student centre. Please note that D2L features a class e-mail list that may be used to distribute course-related information. It is your responsibility to ensure that D2L uses the e-mail address of your choice. The default is your University of Calgary e-mail address.

### **Course Outline:**

#### 1. Linear Models

Ordinary Least Squares, Weighted Least Squares, Median and Quantile Regression, Model Misspecification, Instrumental Variables

CT, Chapter 4

MHE, Chapter 3

#### 2. Classical Hypothesis Testing

- Hypothesis testing for inference

CT Chapter 7

- Specification tests and model selection

CT Chapter 8

#### 3. Instrumental Variables

CT, Chapter 4

MHE, Chapter 3

#### 4. Discrete Choice Models

- Binary Outcome Models: Logit, Probit

CT Chapter 14

Kenneth Train, Chapters 2, 3, 5

- Multinomial Models: Multinomial Logit, Nested Logit, Multinomial Probit, Ordered Choice Model

CT Chapter 15

\*Boskin, Michael J, 1974. A Conditional Logit Model of Occupational Choice. *Journal of Political Economy*, *University of Chicago Press*, vol. 82(2),

- Numerical Maximization

CT Chapter 16

Kenneth Train, Chapter 8

#### 5. Tobit

CT Chapter 16

#### 6. Survival Analysis

CT Chapter 17

\*Van den Berg, Gerard J., 2001. Duration models: specification, identification and multiple durations, in: J.J. Heckman & E.E. Leamer (ed.), *Handbook of Econometrics*, edition 1, volume 5, chapter 55, pages 3381-3460 Elsevier

If time permits, we will also cover panel data methods (fixed effect estimation, diff-in-diff and event study).

### **Grade Determination and Final Examination Details:**

First Midterm Examination: 15%

Second Midterm Examination: 15%

Four Home Assignments and Class Participation: 20%. Students may work on home assignments in groups of up to three people, but they need to hand in individual copies of the solutions. Students are strongly encouraged to work on the assignments and to understand the solutions, as this will undoubtedly help in test preparation. Midterms and Finals are usually based on problem solving techniques developed in class and in the homework assignments.

Final Examination: 50%

Tests and final exams are marked on a numerical (percentage) basis, then converted to letter grades. The course grade is then calculated using the weights indicated above. As a guide to determining standing, these letter grade equivalences will apply:

A+	95 – 100	B	73 – 76	C-	60 – 62
A	85 – 94	B-	70 – 72	D+	56 – 59
A-	80 – 84	C+	67 – 69	D	50 – 55
B+	77 – 79	C	63 – 66	F	0 – 49

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

Non-programmable calculators WILL be allowed during the writing of tests or final examinations.

There will be a Registrar scheduled final examination, held in a classroom, lasting 2 hours.

Tests and exams WILL NOT involve multiple choice questions.

**Notes:**

- Students seeking reappraisal of a piece of graded term work (term paper, essay, etc.) should discuss their work with the Instructor *within fifteen days* of the work being returned to the class.
- It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course.

All students must comply with the regulations published in the University Calendar concerning "Intellectual Honesty," "Examinations," etc.

Students who are unable to write the midterm or an assignment because of an illness, family emergency or religious observance will have the midterm weight shifted to the final examination. Documentation MUST be provided.

Students' Union Vice-President Academic:

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Society of Undergraduates in Economics (S.U.E.):

[www.ucalgary.ca/sue](http://www.ucalgary.ca/sue)

Society of Undergraduates in Economics is a student run organization whose main purpose is to assist undergraduate economics students succeed both academically and socially at the University of Calgary. Services include access to the exam bank, career partnerships with the Career Centre through hosting industry nights and information sessions, recognizing achievements in teaching, and organizing social events for members. They invite you to join by contacting [sue@ucalgary.ca](mailto:sue@ucalgary.ca).

#### *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.
- For program planning and advice, contact the Student Success Centre (formerly the Undergraduate programs Office) at 403-220-5881 or visit them on the 3<sup>rd</sup> Floor of the Taylor Family Digital Library.
- 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.
- Online writing resources are available at <http://ucalgary.ca/ssc/writing-support/online-writing-resources>

Safewalk/Campus Security: 403 220 5333  
Emergency Assembly Point: MSC North Court yard

