

Introduction to Econometrics

(Wednesday: 2:35PM-5:15PM; Thursday: 10:30-12:30 Computer Lab)

In this class we will study, discuss, and practice traditional econometric methods. These methods are frequently used for investigating empirical (real world) data as a first step toward policy or applied economic analysis. Sessions in the computer lab are inherent part of this class as well. The basic objectives of that class are to provide students with the background needed for data analysis and for applied economic research and with “hands-on” experience of working with data and with existing statistical software and packages. This is a “hands on” econometric class: students will study the basic theory and will practice econometrics with real data.

This class introduces students to the basics of regression methods with focus on economic applications. The main topics studied include linear regression models, discrete choice models, instrumental variables and panel data. Common econometric problems (such as omitted variables, missing data, prediction and forecasting) will be studied as well. Depending on time, time series models, and other topics, may be discussed as well.

The primary purpose of this class is to provide students with the background for understanding both (i) the basic theory (mainly regression analysis as applied to economic problems) and (ii) to develop the necessary empirical tools for practicing the theory in a wide range of economic estimation problems. To accomplish this goal, we will emphasize economic applications and experiments that include analyzing real data sets and practicing computer work. In order to understand and evaluate correctly the empirical work, a sound theoretical foundation is needed. This foundation will be developed throughout the class.

We will study each model/problem by trying to understand (i) the data generation process and the economic process generating these data, (ii) the corresponding statistical models for representing this process, (iii) observables and unobservables, (iv) known and unknowns, (v) how to recover the unknowns from the data (the known), (vi) how to develop a statistical estimation criterion, (vii) what properties we want from a good estimator or model, (viii) distribution of estimators, (ix) hypothesis testing, (x) confidence intervals, (xi) basis for prediction, etc.

The course statistical software is STATA.

We will follow these questions and guidelines as we investigate and analyze each one of the following topics.

Tentative Outline of Class

(We may change order and/or add topics throughout the semester)

Lecture	Date	Topic	Readings (S & W) Chapters
1	January 18	Introduction and Review of Statistics/Econometrics (Economics Questions; Probability and random variables; Basic statistics)	1, 2, 3
2	25	Introduction (Cont.); Simple Regression Model - I	4
3	February 1	Simple Regression Model – I (Cont.)	4
4	8	Simple Regression Model – II	5
5	15	Multiple Regression Model and Extensions	6, 7
6	22	Nonlinear Regression	8
7	29	Assessing regression studies	9
8	March 7	Binary and discrete choice models	11
*	14	<i>Spring Break</i>	
9	21	Discrete choice models; Instrumental Variables	11, 12
10	28	Instrumental Variables	12
11	April 4	Panel Data	10
12	11	Time Series and/or Special Topics	14.1-14.4;15;16.1-2
13	18	Experiments and Quasi Experiments	13
14	25	Special Topics and Review (Last Class)	
*Final	May 2	FINAL (2:35PM – 5:05PM)	

Lab Dates and Tentative Plan (We may add/change Labs and Topics)

Due to the class size we split the class into two lab sessions. Make sure you attend the lab in your assigned session (and time)!

Session A: Last name A – Gil...

Session B: Last name Gio... – Z

Lab	Date	Session	Topic
1	Jan 19, 26	A, B	Introduction to Computer Lab and STATA and Basic Data Analysis
2	Feb 2, 9	B, A	Data Analysis and Regressions
3	Feb 16, 23	A, B	Data Analysis and Regressions
4	March 1, 8	B, A	Discrete Choice and survey data
5	March 22, 29	A, B	Discrete Choice and survey data
6	April 5, 12	B, A	Panel data, IV
7	April 19	A & B	Practice with data (Each Session 1 Hour)
7	April 26	B & A	Practice and Review (Each Session 1 Hour – Not Mandatory)

NOTE: Computer Labs are a mandatory part of the class and will take place at the SPA Lab.

Assignments:

Problem Sets will be given periodically (about every two weeks) and will involve both analytical problems and empirical work.

Students may collaborate with others in the class on the computer (empirical) part of the problem sets. Students can work with groups of no more than 3. Even when working as a group, *each student must write her/his answer separately* and explain the analysis in her/his own words.

Grades:

1. Problem Sets: 45% of final grade. This includes summary of the computer labs and one or two short presentation of lab results.
2. Final Exam (55%). (Note: At least two questions from the problem sets will be in the Final Exam.) The final exam may take place in the computer lab.

Office Hours (Kreeger 121): Tuesday 12:00-2:00 and by appointment.

Tel: 885-3784; *Email:* agolan@american.edu

Note: It is a very large class, please email only if it is urgent!

TA's Office Hours:

Heath: Tuesday 9:30AM – 1PM Hurst 202 (In the Lab)

Thursday 1PM – 4PM Hurst 202 (In the Lab)

Tuang: Monday 10:00AM – 12:00PM Kreeger G08 (Basement of Kreeger Hall)

Friday 10:00AM – 1:00PM Kreeger G08 (Basement of Kreeger Hall)

Textbook and Readings

Required

Stock and Watson (SW), 3rd Ed. “*Introduction to Econometrics*” (Addison Wesley, 2010).

Additional Background

Wooldridge “*Econometric Models and Economic Forecasts*” (South-Western College Publishing).

Pindyck and Rubinfeld (PR) “*Introductory Econometrics*” (McGraw Hill, 4th edition, 1998).

Miller and Miller, “John E. Freund’s *Mathematical Statistics with Applications*” (Prentice Hall, 7th ed., 2004).

A Note on Software. It is recommended to do your problem sets with STATA, but it is not required. In the computer lab we will use STATA which is available on the AU server. You can purchase the student version of STATA, Eviews and/or SAS via the computer Lab. We may provide an introductory session for software other than STATA (e.g., SAS and Eviews) later in the semester.