

# UNIVERSITY of HOUSTON

## Introduction to Econometrics – Econ 4365 Spring Semester – 2013

Section 1: 11:30 am - 1:00 pm, Tuesday -Thursday, Agnes Arnold Hall 106

Section 2: 1:00 pm - 2:30 pm, Tuesday -Thursday, Agnes Arnold Hall 106

### Contact information

#### **Instructor:**

Prof. Andrea Szabo

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Office hours: Monday, 3.15 pm – 4.15 pm

#### **Teaching Assistant:**

Edson Silveira

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Office hours: Wednesdays 1:45 pm - 2:45 pm

### Course Description

Econ 4365 introduces students to multiple regression methods for analyzing data in economics and related disciplines. Extensions include regression with panel data, instrumental variables regression, analysis of randomized experiments. The objective of the course is for the student to learn how to conduct – and how to critique – empirical studies in economics and related fields. Accordingly, the emphasis of the course is on empirical applications. The mathematics of econometrics will be introduced only as needed and will not be a central focus.

### Prerequisites

Students are expected to have taken an introductory course in probability and statistics such as Econ 2370. Homework 1 provides a review of these skills.

### Textbook

*James H. Stock and Mark W. Watson (SW): Introduction to Econometrics, 3rd edition, Pearson Addison-Wesley, 2011, ISBN-10: 0138009007. Do NOT buy previous editions of this book.*

### Course Requirements

There will be 10 homework assignments, 2 midterms, and a final.

All homework assignments will be done online through the University of Houston Blackboard Learn website. Each student is required to enroll.

Midterms will be given in class on the dates listed in the calendar. There are no makeup midterms. If a student, for whatever reason, is unable to take one of the midterms at the scheduled time, I will base the student's final grade on the other course components in the manner described below in the section labeled "Course Grade." Specifically, in such a case, "Weighting 1" or "Weighting 2" will be used depending on whether the student missed midterm 1 or midterm 2.

All exams are open book and open notes; bring a calculator. No computers of any kind, cell phones or programmable calculators. No cooperation is allowed during the tests. Academic misconduct will not be tolerated and any instances of it will be dealt with according to the appropriate University channels.

If you disagree with the grading of a midterm, submit it for further review. You must submit a written argument for why you deserve more points for the specific question(s) you would like re-graded. If you do not specify this, the entire test will be regraded and it is possible that you may lose points. You must submit these arguments within one week after the midterm has been returned.

The final exam will be cumulative with some emphasis on the material covered after the second midterm.

**Class Website**

All assignments and handouts will be posted on the class website in Blackboard Learn. Go to <http://www.uh.edu/blackboard> and click the white "Blackboard Learn" button. Log in with your CougarNet ID and password.

**Statistical software package**

You will be required to use *Stata*, a statistical software package. Public versions of *Stata* are available at selected locations on UH campus. Students registered in the econometrics class may use the six computers in the Economics Department Undergraduate Computer Lab in room 208 E McElhinney (hours: M-Th, 8am-4:30pm, F 9am-2pm).

UH has an agreement called "GradPlan" with *Stata* that allows students to purchase various products at much reduced rates directly from *Stata*. The current version is *Stata 12* (released July 2011). I suggest that you buy *Small Stata* which will be able to handle all of the problems that I will assign in the course. The current pricing for 6 month licenses is \$32 for *Small Stata*. For more detail and to order *Stata* online see the GradPlan website indicated below.

<http://www.stata.com/order/new/edu/gradplans/gp-direct.html>

**Grading**

The overall numerical course score will be determined by weighting the course components three different ways and using the highest weighted score. I will drop your lowest 2 homework scores to allow for some flexibility. Thus you will have 8 assignments that count towards your final grade.

Course Component	Weighting 1 (MT1 is lowest score)	Weighting 2 (MT2 is lowest score)	Weighting 3 (Final is lowest score)
Problem Sets	20	20	20
Midterm 1	0	30	25
Midterm 2	30	0	25
Final	50	50	30
Total	100	100	100

The numerical course grade will be converted to a letter grade according to the following scale:

The grading scale is:

92%-100%	A
90%-91%	A-
88%-89%	B+
82%-87%	B
80%-81%	B-
78%-79%	C+
72%-77%	C
70%-71%	C-
68%-69%	D+
60%-67%	D
-59%	F

I reserve the right to lower the percentages.

Tentative Course Schedule:

Class #	Date/Day			Topic	SW Ch. #	Problem Sets
1	Jan	15	T	Economic Questions and Data	Ch. 1	
2		17	Th	Review of Probability, STATA Introduction	Ch. 2	
3		22	T	Review of Statistics, STATA Introduction	Ch. 3	
4		24	Th	Linear Regression with One Regressor I. <i>The linear regression model</i>	Ch. 4 p. 111-126	
5		29	T	Linear Regression with One Regressor II. <i>The Least Squares Assumptions</i>	Ch. 4 p. 126-142	PS 1 Due
6		31	Th	Linear Regression with One Regressor III. <i>Hypothesis Tests, Confidence Intervals, Regression when X is Binary</i>	Ch. 4 p. 149-159, Ch 5 p. 159-161	
7	Feb	5	T	Linear Regression with One Regressor IV. <i>Heteroskedasticity, Homoskedasticity</i>	Ch 5 p. 160-167, 172-180	PS 2 Due
8		7	Th	Linear Regression with Multiple Regressors I. <i>Omitted Variable Bias, The Multiple Regression Model</i>	Ch 6 p. 187-200	
9		12	T	Linear Regression with Multiple Regressors II. <i>Measure of Fit</i> Review for Midterm I	Ch 6 p. 201-203	PS 3 Due
10		14	Th	<b>Midterm I</b>		
11		19	T	Linear Regression with Multiple Regressors III. <i>Multicollinearity</i>	Ch 6 p. 202-219	
12		21	Th	Linear Regression with Multiple Regressors IV. <i>Hypothesis Tests</i>	Ch 7 p. 223-238	PS 4 Due
13		26	T	Linear Regression with Multiple Regressors V. <i>Confidence Sets, Model Specification</i>	Ch 7 p. 238-251	
14		28	Th	Nonlinear Regression Functions I. <i>General Strategy, Nonlinear Functions of Single Independent Variables.</i>	Ch 8 p. 264-286	PS 5 Due
15	March	5	T	Nonlinear Regression Functions II. <i>Interactions Between Independent Variables</i>	Ch 8 p. 286-318	
16		7	Th	Assessing Studies Based on Multiple Regression I. <i>Internal and External Validity</i>	Ch 9 p. 326-343	PS 6 Due
17		12	T	<b>No class. Spring Break.</b>		

18		14	Th	<b>No class. Spring Break.</b>		
19		19	T	Assessing Studies Based on Multiple Regression II. <i>Example: Test Scores and Class Size</i>	Ch 9 p. 343-362	
20		21	Th	Regression with Panel Data I. <i>Fixed Effects</i>	Ch 10 p.363-374	PS 7 Due
21		26	T	Regression with Panel Data II. <i>Time Fixed Effects, Standard Errors</i> Midterm II Review	Ch 10 p.374-381	
22		28	Th	<b>Midterm II</b>		
23	Apr	2	T	Regression with Panel Data III. <i>Example: Drunk Driving Laws and Traffic Deaths</i>	Ch 10 p. 381-396	
24		4	Th	Instrumental Variables Regression I. <i>IV Estimator with a Single Regressor and a Single Instrument, General IV Regression Model</i>	Ch 11 p. 397-415	PS 8 Due
25		9	T	Instrumental Variables Regression II. <i>Instrument Validity</i>	Ch 11 p.415-421	
26		11	Th	Instrumental Variables Regression III. <i>Example: Demand for Cigarettes</i>	Ch 11 p. 421-438	
27		16	T	Experiments I. <i>Potential Problems with Experiments in Practice</i>	Ch 12 p.447-456	PS 9 Due
28		18	Th	Experiments II. <i>The Differences-in-Differences Estimator</i>	Ch 12 p.465-472	
29		23	T	Experiments III. <i>Example: The Tennessee Class Size Reduction Experiment</i>	Ch 12 p.456-465	
30		25	Th	Discussion of final exercise		PS 10 Due

**FINAL** – Section 1: Tuesday, May 7, 11:00 am - 2:00 pm  
Section 2: Thursday, May 9, 2:00 pm - 5:00 pm