

Econ 104: Introduction to Econometrics
University of Pennsylvania, Spring 2012

Instructor: Xu Cheng

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- Office: 3718 Locust Walk, McNeil Building, Room 527
- Lecture: Tuesday and Thursday 1:30-3:00 PM, College Hall 200
- Office Hours: Monday, 2:30-3:30 PM

Textbooks and Online Material

- Required Textbook: Stock and Watson, *Introductory Econometrics* (2010, 3rd Edition), Addison Wesley, HB 139. S765 2010.
- Course Website: blackboard

Pre-requisites:

- Math 104, Math 114, Econ 101, Econ 103 (or Stat 430 and Stat 431). These courses should be completed before taking Econ 104.

Exams and Problem Sets

1. Problem Sets [20%]. Problem sets will be posted on the *blackboard*. Your lowest homework grade will be dropped. Homework late by one day gets 2 points less (one a 0-10 scale). Homework late by more than one day is not accepted.
2. First Midterm [30%], in class, Tuesday 2/21, closed books and notes. There will be no make-up exams for the mid-term.
3. Final Exam [50%], Monday, May 7th, 9:00-11:00 AM, closed books and notes. The final exam will cover materials taught throughout the course.

Course Description:

This course is designed to introduce students to econometric techniques and their applications in economic analysis and decision making. The main objective of the course is to train the student in (i) handling economic data; (ii) quantitative analysis of economic models with

probabilistic tools; (ii) econometric techniques, their application as well as their statistical and practical interpretation; (iv) implementing these techniques on a computer.

Out of Class Collaboration

You are allowed (encouraged) to work together in groups with a maximum of 4 students for the problem sets, but each student must turn in an individual problem set with their own solutions. It is not a violation of this policy to submit essentially the same answer on a problem set as another student, but is a violation of this policy to submit a close to exact copy.

Regrade Requests

The important general rule is that such a request should clearly and succinctly state the unambiguous error you believe has occurred. Requests should occur *within a week of the work being returned*. Errors in grading arising from illegible or garbled answers are not subject to correction. Students who have been graded incorrectly should petition for a correction in writing to the Professor. Students must not approach either instructor or TA with an oral request before making their written request. The entire graded work (problem set or examination) should be resubmitted; there is no guarantee that grades will rise as, statistically, positive and negative errors in grading are equally likely. If the request arises because you think different students have been graded differently, all the affected students should submit their work as a group.

Course Organization -- Econ 104 Introduction to Econometrics, Spring 2012

Lecture Number	Date	Topics		Chapters in Stock and Watson	PS Assigned	PS Due
1	1/12,R	Probability and Statistics (3 Lectures)	Introduction	1, 2.1-2.4		
2	1/17,T		Probability	2.5-2.6	PS1	
3	1/19,R		Statistics	3.1-3.5, 3.7		
4	1/24,T	Linear Regression Model with one Regressor (4 Lectures)	Linear regression model, OLS estimator	4.1-4.2	PS2	PS1
5	1/26,R		Linear regression mode, assumption, properties of OLS, measure of fit	4.3-4.6		
6	1/31,T		Test and CI construction in linear regression model	5.1-5.2	PS3	PS2
7	2/2,R		Regression with binary regressor, homoskedasticity and heteroskedasticity	5.3-5.4, 5.7		
8	2/7,T	Multiple Regression Model (4 Lectures)	Omitted variable bias and multiple regression model	6.1-6.2	PS4	PS3
9	2/9,R		Assumptions of multiple regression model, multicollinearity, dummy variable trap	6.5, 6.7		
10	2/14,T		Distribution of OLS estimator in multiple regression model, test of joint hypothesis, F statistic and its large sample distribution, F statistic under homoskedasticity	6.3, 6.6, 6.8,7.1,7.2	practice midterms	PS4
11	2/16,R		Test of single restriction via transformation, confidence set for multiple coefficients by inverting F statistic, measure of fit in multiple regression	6.4, 7.3-7.7		
	2/21,T			Midterm		
12	2/23,R	Nonlinear Regression Model (3 Lectures)	Nonlinear regression with polynomials and log transformation	8.1, 8.2		
13	2/28,T		Interaction between independent variables, two discrete variables	8.3	PS5	
14	3/13,T		Interaction between independent variables, one discrete variable and one continuous variable, two continuous variables	8.3- 8.5	PS6	PS5
15	3/15,R	Panel Data Model (3 Lectures)	Panel data, fixed effect model, Difference method with 2 time periods	10.1, 10.2		
16	3/20,T		n-1 dummy variables, entity-demeaned regression	10.3		PS6
17	3/22,R		Time fixed effects, both entity and time fixed effects, assumptions for panel data model	10.4-10.7		
18	3/27,T	Regression with Instrumental Variables (4 Lectures)	IV model and two state least squares estimation	12.1	PS7	
19	3/29,R		Inference with IV regression	12.1		
20	4/3,T		General IV regression model	12.2	PS8	PS7
21	4/5,R		Check IV validity, weak IV	12.3-12.6		
22	4/10,T	Binary Dependent Variables (2 Lectures)	Binary dependent variable, linear probability model, probit and logit models	11.1-11.2		PS8
23	4/12,R		nonlinear least squares and maximum likelihood estimation and inference of probit and logit models	11.3-11.5		
24	4/17,T	Time Series (2 Lectures)	Time series data, forecasting, serial correlation	14.1-14.2	PS9	
25	4/19,R		Autocorrelation and Regression	14.3-14.5		
26	4/24,T		Review			PS9