

W 4412: Advanced Econometrics  
Columbia University  
Winter 2012 (Preliminary)

Professor: Serena Ng (IAB 1117, M,W: 11am-noon)  
Teaching Assistant: Felipe Gonzales (fmg2106 W, 4:30-6:30pm)  
Teaching Assistant: Michael Mueller (mgm2146)  
Class Hours: M, W. 2:40-4:00 at Hamilton 503  
Recitation: M 6:10-7pm (IAB 407)

**Objectives and Pre-requisites** This course is intended for students with a strong interest in quantitative methods. Students are expected to have a firm grasp of Chapters 1-8 and 17 of 'Introduction to Econometrics' by Stock and Watson. The pre-requisites are linear algebra (V2010), intermediate microeconomics (W3211), macroeconomics (W3213), and econometrics (W3412). Those who have not taken the required courses will NOT be granted a credit, though they are welcome to sit in the class. There are no exceptions.

**Textbooks**

- (Required) Greene, W. Econometric Analysis, 7th Edition, Prentice Hall.
- (Optional) Stock and Watson, Introduction to Econometrics, Pearson.
- (Optional) Hayahsi, Econometrics, Princeton University Press.

**Evaluation:**

4 problem sets	:	25%
Mid term 1 (February 27)	:	25%
Mid term 2 (March 28)	:	25%
Final Exam (April 30)	:	25%

No make up exams will be given. If you miss mid-term 1, mid-term 2 will count for 40%. In other words, 10% of your grade will be non-refundable!. Problem sets and data will be posted on the course web site. They will be assigned every week and collected on Feb 1, Feb 15, March 26, and April 25. They will be graded by Michael Mueller. The late penalty is 2 points per day. Stata and Matlab are highly recommended. No other software will be supported by the TA. Spreadsheets are strictly prohibited.

**A: Linear Regression Analysis (6 weeks), SW 18, G3,4,5,8**

- 1 OLS in Matrix Form
- 2 Finite Sample and Asymptotic Properties
- 3 GLS and Robust Standard Errors, Delta method
- 4 IV estimation,
- 2 Hypothesis Testing: Wald, LM, LR, model selection, specification tests, structural breaks

**B: Microeconometrics 5 weeks**

- 1 Maximum Likelihood: G14
- 2 Discrete Choice Models: G18 Logit and Probit
- 3 Censored Regressions: G19 Tobit
- 4 Panel data: G11 random, fixed effects, dynamic panel

**C: Time Series Analysis 3 weeks, SW 14, 15, G20, 21**

- 1 Stationary time series models: AR, MA, ARCH, HAC, ADL
- 2 Dynamic causal effects: ADL, VAR
- 3 Non-Stationary time series models: unit root, cointegration

P.S. I am usually in the office and you are most welcome to stop. Emails will most likely not be answered.