Instructor: Prof. Anna Alberini
Lectures: T - Th 11:00 – 12:15
Office hours: Tuesday 9:00 – 10:30 and 3:30 – 5:00.

Textbook: Damodar N. Gujarati, *Basic Econometrics*, 3rd edition (required)

Requirements: One midterm, final, plus a 10-page paper reporting on an empirical analysis of your choice (each worth one-third of the final grade).

Homework: Regularly assigned, along with solutions (discuss).

Suggested Topics:

1. **A review of basic statistical concepts.** (Continuous random variables: distributions and moments; the normal distribution; properties of the expected value; properties of the variance; bivariate distributions, correlation and covariance)

   [Gujarati, §A.1 to A.6 (skip the chi square distribution)]

2. **Statistical Inference.** (Sampling frame: random, cluster, stratified and endogenous sampling; basic properties of estimators: unbiasedness, consistency, asymptotic normality; interval and point estimation) [Gujarati, §A.7, A.8]

3. **The classical linear regression model.**
   -- the model (lecture notes)
   -- assumptions of the classical linear regression model (Gujarati §3.2)
   -- the method of ordinary least squares (Gujarati §3.1 and Appendix to Chapter 3).
   -- properties and distribution of the estimates (lecture notes)
   -- the coefficient of determination (Gujarati §3.5)
   -- testing the significance of individual coefficients (Gujarati, §5.2, 5.3, 5.4, 5.6, 5.7)
   -- testing a set of linear restrictions on the coefficients using the F test (lecture notes)
   -- prediction (Gujarati, §5.10);

   **Midterm about here**

4. **Large sample properties of the OLS estimates**
   -- consistency (lecture notes)
B. Serial Correlation. (some examples of serially correlated error terms: autoregressive errors of the first order, moving average errors of the first order; effects of ignoring serially correlation; correcting for serial correlation; methods for estimating the coefficient of serial correlation: Cochrane-Orcutt, Hildreth-Lu, ML; autoregressive conditional heteroskedasticity). [Greene, §15.1, 15.2, 15.4, 15.5, 15.9]

Homework: Chapter 15, problems 1, 2, 3, 7.
Reading: TBA

9. Systems of equations:

A. The seemingly unrelated regression (SUR) model. (basic notation; structure of the error covariance matrix; GLS estimation; conditions under which GLS is the same as OLS equation by equation) [Greene, §17.1, 17.2.12, 17.2.2]

Homework: Chapter 17, problems 1, 2, 3, 4.
Reading: TBA

B. Systems of simultaneous equations. (introduction to simultaneous equations; a special case: triangular recursive systems; general notation; obtaining the reduced form; identification conditions; estimation techniques: instrumental variables, two and three-stages least squares)

Readings: