

SS 222a: Econometrics I (Statistics)

Meeting palce & times: MW 1-2:30pm, Baxter 128

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Course Website: <http://www.hss.caltech.edu/~mshum/stats.html>

1 Organization

The course grade will be determined by:

1. Problem sets (20%)
2. Midterm exam (35%)
3. Final exam (45%)

The final will *not* be cumulative, and will cover material from *after* the midterm. There will be review sessions before each exam; details will be announced in class.

There will be no makeup for the midterm; if a student misses the midterm, then the weight of the midterm shifts onto the final exam.

Grading of problem sets will be on a $\{\checkmark^+, \checkmark, \checkmark^-\}$ scale.

All problem set solutions should be typed up, preferably in Latex.

Please register for the class. I will use the Caltech “REGIS” website to send classwide emails. Class announcements will also be posted on the class website.

2 Texts

The main text for this class is:

Statistical Inference, G. Casella and J. Berger (hereafter **CB**), Duxbury Press.

3 Topics

We will focus on the material in chapters 1,2,4,5,7,8,9 of CB, with some extra readings for some points.

- Basic probability theory (CB, chap. 1): probability spaces, random variables, distribution and density functions

- Properties of a random variable (CB, chap. 2): change of variables, moments and moment-generating functions
- Multivariate random variables (random vectors) (CB, chap. 4): joint and marginal distributions, conditional distributions, independence of random variables; covariance and correlation
- Basic large sample (asymptotic) theory (CB, chap 5): sums of independent random variables, convergence concepts (convergence in probability, convergence almost surely, convergence in distribution). Laws of large numbers. Central limit theorems.
- Point estimation (CB, chap. 7): maximum likelihood, method of moments, Bayesian inference
- Hypothesis testing (CB, chap. 8)
- Interval Estimation (CB, chap. 9)
- Data-resampling techniques