

Statistics and Econometrics Block I (2011-2012)

Probability, Expectations, Asymptotics, and Introduction to Inference

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Course Outline

The course will cover an introduction to statistics and econometrics. The course will loosely follow Casella and Berger, *Statistical Inference*, 2nd Edition, chapters 2 through 7 (though most of chapters 3 and 6 and sections 5.6.2, 5.6.3 will not be covered). There are many good textbooks that cover the same material, such as *Introduction to Econometrics and Statistics*, by T. Amemiya and *Introduction to Mathematical Statistic* by Hogg, Craig, and McKean.

Grading Policy

Grades will be based on: Problem sets (20%); and a final exam (80%). There will be about four problem sets.

Schedule (preliminary)

Week 1 Lectures: Tue. 11-13 & Thu. 11-13.

Introduction and some elementary probability and distribution theory for scalar random variables. (Casella and Berger, Chapter 2). Transformation of a random variable. Expectations. The moment generating function and the characteristic function of a random variables.

Week 2 Lectures: Mon. 15-17 & Tue. 11-13. Exercises Thu. 11-13.

Distribution theory for random vectors & properties of random samples. (Casella and Berger, Chapters 4)

Problem Set 1 due on Tuesday at 11 am.

- Week 3 Lectures: Mon. 15-17 & Tue. 11-13. Exercises Thu. 11-13.
Properties of Random Samples, Review of Matrix Algebra, and Asymptotics (Casella and Berger, Chapter 5.1-5.5 and 5.6.1)
Problem Set 2 due on Tuesday at 11 am.
- Week 4 Lectures: Mon. 15-17 & Tue. 11-13. Exercises Thu. 11-13.
More Asymptotics (Casella and Berger, Chapter 5.1-5.5 and 5.6.1).
Problem Set 3 due on Tuesday at 11 am.
- Week 5 Lectures: Wed. 11-13 & Thu. 11-13. Exercises Fri. 15-17.
Introduction to Methods for Inference: Methods of Moments and Maximum Likelihood. (Casella and Berger Chapter 7 and lecture notes).
Problem Set 4 due on Wednesday at 11 am.