

ECONOMICS 671: ECONOMETRIC ANALYSIS I

Department of Economics, University of Michigan, Fall 2008

1 Description

This is the first course in the two-course block that forms the basic required sequence in Econometrics for all doctoral students in Economics. This class will cover three main topics: probability theory, finite sample statistics, and asymptotic statistics. The sequel course (Econ-672, Winter 2009) will study econometric theory relying on the general results presented in this class.

The course will be theoretical and technical, and will require an important background in mathematics and statistics. The minimum requirements are real analysis and mathematical statistics at the upper undergraduate level. Lecture notes for each class will be given in advance, including exercises and references to standard textbooks. A good general reference for this class is Statistical Inference, by George Casella and Roger L. Berger, Duxbury, 2002. This class will be more mathematically rigorous than this book, but the main ideas and concepts will be essentially the same. In fact, an excellent exercise would be to try to link the material presented in this course to the material discussed in Casella and Berger's book.

2 Useful Information

Instructor: Matias D. Cattaneo
Office Hours: Tue 8:30a-10:00a, 307 Lorch
Email: cattaneo@umich.edu
Website: <http://www.umich.edu/~cattaneo>
Lecture: Mon-Wed 10:00a-11:30a, 110 Denn
Section: Tue 6:00p-7:30p, 110 Denn

3 Grading

Problem Sets: 20% Weekly, due in Section
Mid-Term: 30% 6:00p-8:00p, Tue 28-Oct
Final Exam: 50% 10:30a-12:30p, Tue 16-Dec

4 Topics

Part I – Measure-Theoretical Probability Theory: Measure Theory and Probability; Random Variables, Distribution Functions and Independence; Integration Theory, Densities and Expectations; Integration to the Limit and Probability Inequalities; Conditioning.

Part II – Finite Samples Statistics: Models, Parameters and Statistics; Data Reduction; Maximum Likelihood Estimation; Minimum Contrast Estimation; Numerical Algorithms; Measures of Performance; Hypothesis Testing and Confidence Regions.

Part III – Asymptotic Statistics: Modes of Convergence, Law of Large Numbers; Central Limit Theorems; Applications.