21PD01

Advanced Econometric Methods I

Term 1 - 6 ECTS

Mandatory Course

Prof. Geert Mesters

Prerequisites to Enroll

The students are assumed to be familiar with undergraduate level linear algebra, statistics and probability at the level of a textbook like Casella and Berger as well as the Introduction to Econometrics textbook by Stock and Watson (at least up to chapter 15).

Overview and Objectives

This is an introductory course in econometrics intended for PhD students. The course is designed to cover the basic theory of econometrics. The approach of the course is to introduce econometric methods, discuss their statistical foundations, and apply them to real world problems. The final objective is for students to know what method to apply in each case, and what assumptions are needed for correct inference in each situation.

This course is the first in a sequence of three, designed for students that intend to pursue a PhD in Economics. It is assumed that the students have an advanced knowledge of linear algebra, probability, and undergraduate econometrics.

Course Outline

Part I: Core methods (20 hours)

Basic Mathematical Statistics
Small Sample Properties of OLS

Part II: Extensions and applications (20 hours)

Large Sample Properties of OLS
Single Equation GMM

Required background

Students are assumed to be familiar with undergraduate level probability, statistics, and econometrics. Chapters 1-4 of Casella and Berger (2002) and the textbook of Stock and Watson provide an excellent preparation for this course and may be read concurrently by those students who have gaps in their previous training.

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Required Activities

There will be a weekly take home problem set. You may work in small groups (3-4 people) but every student has to hand in an individual set of solutions.

Evaluation

Grades will be based on the problem sets (25%) and a final exam (75%).

Competences

Acquire a solid knowledge base for the study of quantitative issues.

Ability to Recognize and know how to use the principles of econometrics and statistics.

Learning Outcomes

Students will acquire the technical tools that will allow them to perform the advanced analytics required in the second module as econometric methods.

Students will know what the appropriate inference for each situation is.

Materials

The course will cover

Chapters 5-9 of Casella, G. & Berger, R. L. (2002), Statistical Inference, 2nd Edition, New York

Chapters 1,2 and 3 of Hayashi, F. (2000), Econometrics, Princeton University Press, New Jersey

Students may also find the following references of use:

Davidson, R. & MacKinnon, J. G. (2004), Econometric Theory and Methods, Oxford University Press, New York

Gallant, A. R. (1997), An Introduction to Econometric Theory, Princeton University Press, New Jersey

Hansen, B. (2014), Econometrics, available from

http://www.ssc.wisc.edu/~bhansen/econometrics/Econometrics.pdf

White, H. (2001), Asymptotic Theory for Econometricians: Revised Edition, Academic Press, New York.