

COURSE SYLLABUS

21PD01

Advanced Econometric Methods I

6 ECTS

TERM 1

MANDATORY

Professor

Prof. Geert Mesters

Prerequisites to enroll

1. Strong knowledge of mathematical statistics at the level of Casella & Berger
2. Strong knowledge of linear algebra at the level of Linear Algebra and its Applications by D.C. Ley
3. Basic knowledge of the use of econometric software such as STATA, R, Python or Matlab
4. Maybe undergraduate econometrics (e.g. Stock & Watson's Introduction to Econometrics)

Overview and objectives

This is a graduate level course in econometrics. The course is designed to cover the basic procedures of econometrics focusing on moment based estimation. The approach of the course is to introduce econometric methods and discuss their statistical foundations. The course emphasizes econometric theory.

Broadly speaking the course covers

1. Some basic statistical theory
2. Linear regression (finite sample, large sample and simulation based theory)
3. Generalized method of moments (standard and robust inference)

Course outline

Teaching consists of 20 lectures (2 hours each) and 10 seminars (1 hour each). Lectures will develop the concepts and methodologies of the subject. Seminars will cover solutions to the homework problems and any other material not covered in lectures. Homework problems will also cover material not (or not yet) covered in lectures. Participation and asking questions in lectures and seminars is highly encouraged.

Students are encouraged to work in groups of 3 – 4 in order to practice teamwork and share different ways of tackling the homework problems. Each group submits a single solution set for each problem set. Exact dates and times for submitting the homework will be mentioned in the problem sets.

Evaluation

The total grade is the sum of:

Homework: 20 points

December Exam: 80 points

To pass the course the student should obtain at least 50 points in total. There are no resit opportunities.

Materials

The course follows the textbooks *Theoretical Statistics: Topics for a Core Course* by Keener and *Econometrics* by Hayashi (Chapters 1-3). In addition it relies on some material from the textbook *Econometrics* by Bruce Hansen, review papers, and some class notes.

Students may also wish to consult the following sources:

- *All of Statistics: A Concise Course in Statistical Inference* by Wasserman, great text that covers many many topics.
- *Analysis of Cross-Section and Panel Data* by Wooldridge. An alternative textbook treatment of many of the econometric topics we plan to cover.
- *Asymptotic theory for econometricians* by White. A good complement to the large sample part of the course.

Competencies

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