Econometrics I

Academic Year: (2020 / 2021) **Review date: 17-07-2020**

Department assigned to the subject: Economics Department

Coordinating teacher: ESCANCIANO REYERO, JUAN CARLOS

Type: Compulsory ECTS Credits : 9.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus, Linear Algebra and Statistics at B.Sc. in Economics level.

OBJECTIVES

This course provides the probability and statistics background for Econometrics II as well as the rest of quantitative courses taught in our Ph.D. program. The course assumes that the student has knowledge of Calculus, Algebra and Statistics needed for standard Econometrics courses at a Bachelor level. At the end of the course the student is expected to acquire the probability and statistical tools needed to read research articles in professional journals.

DESCRIPTION OF CONTENTS: PROGRAMME

PART I: PROBABILITY THEORY

1.- Probability spaces and random elements.

2.- Integration and differentiation.

3.- Distribution and its characteristics.

4.- Conditional expectations.

5.- Asymptotic theorems.

PART II: STATISTICAL INFERENCE

1.- Population, sample and moments.

2.- Statistical inference.

3.- Asymptotic criteria and inference.

4.- Estimation in parametric models.

5.- Hypotheses tests.

PART III: LINEAR MODEL

1. Modeling linear and nonlinear relations.

2. Finite sample inferences using OLS and ML.

3. Asymptotic inferences.

4. Identification and misspecification.

5. GMM/IV estimation.

LEARNING ACTIVITIES AND METHODOLOGY

Training activities

Lectures
Practical classes
Problem Sets
Individual student work
Tutorials

Teaching methodology

Exhibitions in class with teacher support and audiovisual media, in which the main concepts of matter are developed and the literature is provided to supplement student learning.

Practical classes with resolution of exercises and problems that illustrate the theory and allow to study particular cases and small extensions.

Problem sets to solve at home individually, helping to systematize the study of the subject and to revise fundamental concepts.

ASSESSMENT SYSTEM

1 quiz + 4 sets of problems to be handled in the day of the quiz & exam: 45%

Final exam: 55%

% end-of-term-examination:	55
% of continuous assessment (assigments, laboratory, practicals…):	45

BASIC BIBLIOGRAPHY

- Hayashi, F. Econometrics., Princeton University Press., (2000)
- Shao, J. Mathematical Statistics., Springer, (2003)
- Shao, J. Mathematical Statistics: Exercises and Solutions., Springer., (2005)

ADDITIONAL BIBLIOGRAPHY

- Amemiya T. Advanced Econometrics, Harvard University Press, (1985)
- Ash, R. Probability and Measure Theory, Academic Press., (2000),2nd Edition.
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- Davidson, R. and J.M. Makinnon Estimation and Inference in Econometrics,, Oxford University Press., (1993)
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- Lehman, E.L. Elements of Large-Sample Theory,, Springer, (2004)
- Lehman, E.L. and Casella, G. Theory of Point Estimation, Springer, (2001)
- Lehman, E.L. and Romano, J.R. Testing Statistical Hypothesis, Springer., (2005)
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- Mood, A., F. Graybill., and D. Boes Introduction to the Theory of Statistics, McGraw Hill., (1974)
- Rao, C.R. Linear Statistical Inference and its Applications, Wiley., (1973)
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- Ruud P. (2000) An introduction to Classical Econometric Theory, Oxford University Press., (2000)
- Serfling, R. Approximation Theorems of Mathematical Statistics., Wiley, (1980)
- White, H. Asymptotic Theory for Econometricians., Academic Press., (1984)

BASIC ELECTRONIC RESOURCES

- Jun Shao . Lecture Notes Probability and Statistics 709: http://www.stat.wisc.edu/~shao/stat709/main.html

- Jun Shao . Lectures Notes Probability and Statistics 710: http://www.stat.wisc.edu/~shao/stat710/main.html