

# Course guide

## 200625 - AE - Econometric Analysis

**Last modified:** 11/04/2024

**Unit in charge:** School of Mathematics and Statistics  
**Teaching unit:** 1004 - UB - (ENG)Universitat de Barcelona.  
**Degree:** MASTER'S DEGREE IN STATISTICS AND OPERATIONS RESEARCH (Syllabus 2013). (Optional subject).  
**Academic year:** 2024    **ECTS Credits:** 5.0    **Languages:** Spanish

### LECTURER

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**Coordinating lecturer:** ERNEST PONS FANALS  
**Others:** Primer quadrimestre:  
DAVID MORIÑA SOLER - A  
ERNEST PONS FANALS - A

### PRIOR SKILLS

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The course assumes a level of knowledge of statistics similar to what you can assume as prior access to the master. Students should be familiar with the concepts of hypothesis testing and statistical significance in a lineal model framework. Concepts necessary to follow the course can be found for example in the text "Practical Regression and Anova using R " available on the R website (<http://cran.r-project.org/doc/contrib/Faraway-PRA.pdf>).

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

5. CE-1. Ability to design and manage the collection of information and coding, handling, storing and processing it.
6. CE-2. Ability to master the proper terminology in a field that is necessary to apply statistical or operations research models and methods to solve real problems.
7. CE-8. Ability to discuss the validity, scope and relevance of these solutions and be able to present and defend their conclusions.

**Transversal:**

3. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

### TEACHING METHODOLOGY

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Own teaching of the subject is based on the use of teaching resources listed below:

- Lectures attending classes (main agent: teacher)
- Practical classes (main actors: website)
- Independent work of students (main actors: students).

Students to submit the contents of a theoretical nature of the lesson, complete with practical exercises in the keynote sessions.

In practical computer sessions are designed to bring students to use theoretical concepts studied in previous classes. To perform this task students will follow a guided practice.

## LEARNING OBJECTIVES OF THE SUBJECT

It is expected that once the course is completed, students are able to master the basic econometric methods and techniques as well as the vocabulary and concepts of econometrics own . In addition to identifying the problems that can be treated with econometric tools , raise them properly and incorporates the results of econometric analysis to the process of decision making.

All this leads to in the work plan of the course the fundamental theoretical aspects of Econometrics with other more applied those combined. In this sense, one of the objectives to consider when teaching the course syllabus is to find the balance between formalism in the development of content and applicability from free software known to students as R.

Specifically , it is intended that students have fundamental knowledge regarding the use of econometric models adapted to each of the following situations : models for time series models to panel data models with qualitative dependent variables and models for spatial data .

## STUDY LOAD

Type	Hours	Percentage
Self study	80,0	64.00
Hours large group	30,0	24.00
Hours small group	15,0	12.00

**Total learning time:** 125 h

## CONTENTS

### ECONOMETRIC MODELS

**Description:**

- 1.1. Concept and Content
- 1.2. The standard model of multiple linear regression
- 1.3. Inference and Prediction
- 1.4. Econometric Models specification
- 1.5. Stages in econometric research

**Full-or-part-time:** 9h

Theory classes: 6h

Laboratory classes: 3h

### TIME SERIES ECONOMETRIC MODELS. UNIT ROOTS

**Description:**

- 2.1. Introduction.
- 2.2. Unit root tests.
- 2.3. Cointegration concept.
- 2.4. Cointegration tests.
- 2.5. Modelling cointegrated series using cointegration error models.

**Full-or-part-time:** 9h

Theory classes: 6h

Laboratory classes: 3h

### ECONOMETRIC MODELS FOR PANEL DATA

**Description:**

- 3.1. Ppanel data and non observable effects (individual and temporary).
- 3.2. Static models: Alternative estimators and comparison of methods.
- 3.3. Dynamic models: implications for new static estimators and estimators.
- 3.4. Applications

**Full-or-part-time:** 9h

Theory classes: 6h

Laboratory classes: 3h

### ECONOMETRIC MODELS FOR LIMITED DEPENDENT VARIABLE

**Description:**

- 4.1. Binary choice model.
- 4.2. Logit and probit models.
- 4.3. Multinomial models.
- 4.4. Count data models.

**Full-or-part-time:** 9h

Theory classes: 6h

Laboratory classes: 3h

### ECONOMETRIC MODELS FOR SPATIAL DATA

**Description:**

- 5.1. Definition of spatial autocorrelation.
- 5.2. Causes and consequences of spatial dependence in a regression model
- 5.3. Contrast and estimation with spatial dependence.
- 5.4. Definition of spatial heterogeneity.
- 5.5. Causes and consequences of spatial heterogeneity in a regression model.
- 5.6. Contrast and estimation with spatial heterogeneity.

**Full-or-part-time:** 9h

Theory classes: 6h

Laboratory classes: 3h

## GRADING SYSTEM

The evolution model assessment will be the subject of ongoing evaluation. Given the empirical nature of the course, the assessment is based on two types of activities:

A. The practical activities. Throughout the semester performing a set of activities that will be announced at the beginning of the course (50%) will be proposed.

B. A final test (50%)



## BIBLIOGRAPHY

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### Complementary:

- Greene, William H. Análisis econométrico. 3a ed. Prentice-Hall, 2000. ISBN 8483220075.
- Maddala, G. S. Introduction to econometrics. 4a ed. Willey, 2009. ISBN 9780470015124.
- Novalés Cinca, Alfonso. Econometría. 2ª ed. Madrid: Mc Graw-Hill, 1993. ISBN 8448101286.
- Wooldridge, Jeffrey M. Introducción a la econometría : un enfoque moderno. 2ª ed. Madrid: International Thomson Editores Spain Paraninfo, 2005. ISBN 8497322681.

## RESOURCES

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### Other resources:

It is recommended to consult the information available through the virtual campus or web page of the subject as well as the following material:

- \* Scripts and transparencies used in class
- \* Exercises proposed in class sessions
- \* Material of the practical sessions, which include: detailed description of the practice so that each student can perform it independently, and the data corresponding to the practice.
- \* Proposed practices: for each of the practices (corresponding to a topic), additional practices are also proposed that students can use as an example. For this, some indications and data are provided.