Introduction to Econometrics

Code: 104874
ECTS Credits: 6

Degree	Type	Year	Semester
2503852 Applied Statistics	OB	3	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Raquel Andres Martinez

Email: Desconegut

Use of Languages

Principal working language: catalan (cat)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Prerequisites

It is recommended that the student have studied mathematics, statistics and linear models that have given him knowledge in linear algebra, matrix analysis, theory of probability and inference statistics (estimation and contrast of hypotheses).

Objectives and Contextualisation

The main objective of the course is to provide students with basic knowledge (theoretical and practical) of the econometric analysis of uniecuational models. The student will acquire the necessary capacity to perform the specification, estimation and contrast of applied econometric models and studies, as well as the ability to interpret general econometric results.

Competences

- Analyse data using statistical methods and techniques, working with data of different types.
- Correctly use a wide range of statistical software and programming languages, choosing the best one for each analysis, and adapting it to new necessities.
- Critically and rigorously assess one's own work as well as that of others.
- Formulate statistical hypotheses and develop strategies to confirm or refute them.
- Identify the usefulness of statistics in different areas of knowledge and apply it correctly in order to obtain relevant conclusions.
- Interpret results, draw conclusions and write up technical reports in the field of statistics.
- Make efficient use of the literature and digital resources to obtain information.
- Select and apply the most suitable procedures for statistical modelling and analysis of complex data.
- Select statistical models or techniques for application in studies and real-world problems, and know the tools for validating them.
- Select the sources and techniques for acquiring and managing data for statistical processing purposes.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.

- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Use quality criteria to critically assess the work done.
- Work cooperatively in a multidisciplinary context, respecting the roles of the different members of the team.

Learning Outcomes

1. Analyze data from official statistics and econometrics by working with qualitative and quantitative data.
2. Choose the most suitable type of sampling for official statistics and econometrics.
3. Critically assess the work done on the basis of quality criteria.
4. Design and conduct hypothesis tests in the different fields of application studied.
5. Draw conclusions that are consistent with the experimental context specific to the discipline, based on the results obtained.
6. Draw up technical reports that clearly express the results and conclusions of the study using vocabulary specific to the field of application.
7. Identify the most important information sources in official statistics and econometrics.
8. Interpret statistical results in applied contexts.
9. Justify the choice of method for each particular application context.
10. Make effective use of references and electronic resources to obtain information.
11. Reappraise one's own ideas and those of others through rigorous, critical reflection.
12. Recognize the advantages and drawbacks of the different statistical methodologies when studying data from a variety of disciplines.
13. Recognize the importance of the statistical methods studied within each particular application.
14. Recognize the usefulness of statistical inference for official statistics and econometrics.
15. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
16. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
17. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
18. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
19. Use different programmes, both open-source and commercial, associated with the different applied branches.
20. Work cooperatively in a multidisciplinary context, accepting and respecting the roles of the different team members.

Content

(T: theory, S: problems or seminars, PS: preparation of problems or seminars, L: laboratories, PP: practical preparation, E: study, AA: other activities, indicate the number of hours dedicated to each activity)

Unit 1: Introduction

- What is econometrics?
- Economic models and econometric models
- The economic series and its problems

T S PS L E PP AA Total

Unit 2: The linear regression model

- Specification of the linear regression model: simple and multiple
- Basic assumptions of the linear regression model
- Estimate for Ordinary Least Squares
- Contrasts
- Prediction
- Fictitious variables

Unit 3: Specification errors

- Specification errors
- Missing relevant variables
- Inclusion of irrelevant variables
- Functional form erroneous

Unit 4: Extension of the linear regression model

- Multicollinearity
- Heteroscedasticity
- Autocorrelation
- Generalized least squares

Unit 5: Dynamic Models

- Distributed delay models
- Autoregressive models
- Instrumental variables estimation

Unit 6: Models with discrete dependent variable

- Linear probability model
- LOGIT model
- PROBIT model

Methodology

Two hours of theoretical classes a week plus two of practices (with econometric software) and resolution of exercises related to the contents explained in class in order to favor the assimilation of this knowledge by the student.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory practices	30	1.2	1, 11, 3, 6, 5, 8, 9, 17, 15, 16, 13, 20, 19, 10
Theory	30	1.2	1, 4, 7, 8, 9, 13, 14
Type: Supervised			
Solving problems	30	1.2	1, 11, 3, 4, 5, 8, 9, 15, 20
Type: Autonomous			
Study	60	2.4	1, 4, 7, 14

Assessment

The activities to evaluate the subject will be:

1. Written test to be held in class classroom about the subject explained. This test does NOT release matter and represents 20% of the final grade.
2. Practice test to be held in the computer room. This test does NOT release matter and represents 20% of the final grade.
3. A final exam on all course subjects. This test will contain theoretical and practical aspects, and represents 40% of the final grade.
4. Delivery of exercises and empirical work. During the course the students will have to give lists of problems and an empirical work. This activity will represent 20% of the final mark.

A student who has not participated in any of the described assessment activities will receive the "Not presented" qualification. If a student performs some of the assessment activities, even if it is only one, you can no longer opt for a "Not Presented".

In the case of failing the subject, the students will have the possibility of presenting themselves to a retake exam. In order to opt for this option it is essential to have submitted to both partial tests and to the final exam. The note of the retake exam replaces the note of the partial and the final exam. Therefore, notes on exercise deliveries and empirical work are not recoverable.

Attention: "Notwithstanding other disciplinary measures that are deemed opportune, and in accordance with the current academic regulations, the irregularities committed by the student who can lead to a variation of the qualification of an evaluation act will be graded with a zero. Therefore, plagiarizing, copying or letting copying a practice or any other evaluation activity will imply failing it with a zero and can not be recovered in the same academic year. If this activity has a minimum associated mark, then the subject will be failed. "

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Delivery of Exercises and Empirical	20%	0	0	1, 11, 3, 4, 7, 8, 18, 17, 15, 16, 12, 2, 20, 19,

Work				10
Final exam	40%	0	0	4, 5, 8, 17, 15, 14
Practice Test	20%	0	0	1, 4, 6, 5, 7, 8, 9, 15, 13, 19
Written Test	20%	0	0	4, 5, 8, 9, 17, 14

Bibliography

- Fernández, M.D. and Llorente Marrón, M.M. "Econometría". Ediciones Pirámide. (Spanish)
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- Johnston, J. "Econometrics Methods". McGraw.
- Maddala, G.S. "Introduction to Econometrics". Wiley.
- Martín, G., Labeaga, J.M.; Mochón, F. "Introducción a la Econometría". Prentice-Hall. (Spanish)
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- Pulido, A., Pérez, J.. "Modelos Econométricos: Guía para la elaboración de modelos econométricos con Eviews". Ed. Pirámide. (Spanish)
- Wooldridge, J.M. "Introductory Econometrics: A Modern Approach". Cengage learning.