COURSE DATA

DATA SUBJECT

Code: 44942
Name: Econometrics
Cycle: Master's Degree
ECTS Credits: 5
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
2242 - Master's Degree in Economics	Facultat d'Economia	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2242 - Master's Degree in Economics	Instrumental matter	COMPULSORY

COORDINATION

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BRETO MARTINEZ CARLES

SUMMARY

This course introduces the main methods of econometric analysis and their application to economics. The main goal of the course is to teach the students how to become both producers and critical consumers of empirical research. This is achieved by focusing both on the theoretical properties and on the practical implementation of the techniques.
The course starts introducing the classical linear regression model, assumptions about the explanatory variables and disturbances, properties of the least squares estimator and hypothesis tests. This first part of the course tries to provide all the students, those who have some training in undergraduate econometrics and those who have not, with an homogeneous basis. A second part of the course introduces the characteristics of non-spherical disturbances and the generalized least squares model, endogeneity issues and instrumental variables estimation, the generalized method of moments, the method of maximum-likelihood and simultaneous equations estimation.
The course also aims to develop the students' abilities to apply the methods to real data using the econometrics programme STATA.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

Students will benefit greatly from any introductory undergraduate course of econometrics. Nevertheless, the course is orientated also to those without previous knowledge of econometrics. The assumption is that students have some training in basic statistical tools and linear/matrix algebra, which are extensively used in the course.

COMPETENCES / LEARNING OUTCOMES

2242 - Master's Degree in Economics

Acquire linguistic and technological skills: ability to use English in the scientific field of economics and to use ICT in the field of economic study and research.

Know how to manage and process databases using the most appropriate and current techniques and software packages.

Know how to properly use econometric techniques applied to the analysis of the functioning of the economy.

Know the databases and bibliography necessary to carry out economic research work.

Students should demonstrate self-directed learning skills for continued academic growth.

Students should possess and understand foundational knowledge that enables original thinking and research in the field.

Use the knowledge gained to identify career prospects and sources of employment, and acquire the personal skills that facilitate professional insertion and development. To that end, students should know and know how to use job search techniques and tools and consider entrepreneurship as a professional alternative.

DESCRIPTION OF CONTENTS

1. LINEAR REGRESSION WITH i.i.d. ERRORS

1.1 Introduction.
1.2 OLS estimation.
1.3 Hypothesis testing.
1.4 Dummy variables

2. REGRESSION WITH non-i.i.d. ERRORS

2.1 Types of deviations from i.i.d. errors: heteroskedasticity and serial correlation.

1. Econometrics

1. LINEAR REGRESSION WITH i.i.d. ERRORS

1.1 Introduction.
1.2 OLS estimation.
1.3 Hypothesis testing.
1.4 Dummy variables2.2 The robust estimator of the VCE.
2.3 The generalized least-squares estimator, GLS (and Feasible GLS).
2.4 Most common corrections in applied work.

3. SIMULTANEOUS EQUATIONS MODELS

3.1 The nature of simultaneous equations models.
3.2 Simultaneity bias in OLS.
3.3 Identifying and estimating a structural equation.

4. ENDOGENEITY

4.1 Endogeneity in economic relationships.
4.2 Instrumental variables estimation and 2SLS.
4.3 Tests for overidentifying restrictions (validity of instruments).
4.4 Tests for relevance of instruments.
4.5 Tests for endogeneity.

5. CAUSAL IDENTIFICATION BASED ON 'THE COUNTERFACTUAL' (methods for policy evaluation)

5.1 Intuition: "What would have happened if...?" Parallelism with experimental data.
5.2 Some 'design' estimators: 'matching' estimators, dif-in-dif estimation, regression discontinuity, and the synthetic control method.
5.3 Necessary conditions in each case to validate the method (validity checks).

6. MAXIMUM LIKELIHOOD ESTIMATION

6.1 Introduction.
6.2 General framework for conditional maximum likelihood (CML) estimation.
6.3 Consistency of CML.
6.4 Asymptotic normality and asymptotic variance estimation.
6.5 Tests based on ML estimation.

Practical sessions: INTRODUCTION TO STATA

- The basics.
- Getting the data into STATA.
- Common data transformations.
- Organizing and handling economic data.
- Application of methods.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	40,00
Classroom practices	10,00
Total hours	**50,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	75,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**75,00**

TEACHING METHODOLOGY

The course is taught two-hour lectures and one and a half-hour tutorial (or practical class) per week.

- The lectures will focus on presentation of the theoretical concepts and models. To this purpose, students will count on material provided by the tearcher in advance to the lectures. Following the text books is also essential to complement the theoretical lectures.

- The practical classes will be orientated to develop students' abilities in applying the theory to real data using the course software STATA. Students will need to solve some exercises (analytical and computer exercises) both in advance to the class and also during class time.

EVALUATION

This course will use the following evaluation procedure:

- Final exam (70% of the final mark): Written exam, consisting on theoretical and/or theoretical-practical questions and/or problems.

- Continuous assessment of the student based on the resolution of exercises and the preparation of assignments (30% of the final mark). This assessment will consist of the completion and presentation of both analytical and computer exercises for each subject, which will be linked to the student's participation in the practical classes, as well as the delivery of any other work that the instructor deems appropriate to carry out throughout the semester. This continuous assessment is not recoverable, although the grade may be kept until the second sitting in the event that the student does not pass the final exam in the first sitting.

The final mark will be the weighted sum of the final exam and the continuous assessment (not recoverable). In order to add up the continuous assessment, it is essential to pass the exam.

In the event of failing the final exam, the mark that will appear in the official lists will be the mark obtained in that exam (calculated out of 10).

Students suspected of attempted copying, plagiarism, or impersonation in the delivery of assignments or the exam will receive a final mark of zero.

The official regulations of the center regarding the evaluation and grading of subjects can be consulted at the following link:
https://www.uv.es/graus/normatives/2017_108_Reglament_avaluacio_qualificacio.pdf

REFERENCES

- Wooldridge, J.M. (2013). Introductory Econometrics: A Modern Approach, 5th edition. Cengage Learning (Previous editions: 2009, 2006, 2003).
- Greene, W.H. (2012). Econometric Analysis, 7th edition. Prentice Hall.
- Baum, Ch. F. (2006). An Introduction to Modern Econometrics Using STATA. STATA-Press.
- Wooldridge, J.M. (2002). Econometric Analysis of Cross-Section and Panel Data. The MIT Press.
- Stock J.H. and Watson M.M. (2020) Introduction to Econometrics. (4th Edition, Global Edition). Pearson.
- Econometrics in YouTube (last accessed July 2024): https://www.youtube.com/playlist?list=PLwJRxp3blEvZyQBTTOMFRP_TDaSdly3gU