ECONOMETRICS

COURSE DETAILS

Code	36277
Degree	Degree in Business Management
Mention	Econometrics
Itinerary	Entrepreneurship
Year	3º
ECTS	6

Professor

Name	Department	Tutorials
Belén García-Cárceles begaca@edem.es	Mathematics and Statistics	Wednesday afternoon (by appointment)

SUMMARY

Econometrics is a compulsory course with a total workload of 6 ECTS credits (150 hours) in the first semester of year three. The course integrates knowledge from economic theory, statistical inference and mathematics, also compulsory subjects provided in the Grade of Management and Business Administration (year one and two).

In this course, students will learn how to approach the empirical assessment of **socio-economic reality** using parametric models and samples of data. They will learn the technical insights of model specification, estimation, validation, and their practical application such as prediction and decision making.

The introductory character of the subject primary focus on linear regression models using Ordinary Least Square estimation process. Also, the course shows the use of an **econometric** software, basic principles and practices for **data management** and the development of **analytic skills**.

Therefore, it is an applied introductory course designed using active teaching methodologies, which provides a strong theoretical background to allow a comprehensive view of the instruments of quantitative analysis. Those used in **nowadays** assessment of economic and business reality for **decision making**.

PRIOR KNOWLEDGE

Although there are no prerequisites, students will be using contents studied in:

- Mathematics.
- Introduction to Economics.
- Statistical Inference: Introduction.

COMPETENCES

BASIC COMPETENCES:

- Ability to analyze and summarize.
- Ability to organize and plan.
- Oral and written communication in English.
- Ability to use ICT in the learning environment.
- Ability to research and analyze information from a wide range of sources.
- Problem-solving ability.
- Decision-making ability.
- Ability to negotiate and reconcile interests effectively.
- Ability to convey and communicate complex ideas and proposals to both specialist and non-specialist audiences.
- Teamwork ability.
- Ability to be critical and self-critical.
- Effective time management.
- Independent study skills.
- Ability to adapt to new situations.
- Work with initiative and a spirit of entrepreneurship.
- Commitment to quality.

SPECIFIC COMPETENCES:

- Know and use appropriately the various quantitative and qualitative methods to argue in a correct and analytical way, evaluate results and predict economic and financial magnitudes.
- The know-how to make strategic assessments in complex and uncertain situations, using the appropriate methodology to resolve them.
- Decision-making ability in stable, as well as less certain situations.
- Ability to apply analytic and mathematical methods to analyse economic and business problems.
- Ability to define, solve and present complex problems systematically.

- Ability to communicate using formal writing, graphs, and symbols.

- Ability to plan, to organize and to control and evaluate the implementation of business strategies.

- To develop a critical capacity on the Spanish and international economic news.

- The capacity to evaluate the context in which entrepreneurial ideas and initiatives can be introduced.

LEARNING OUTCOMES

- Evaluate the state of an economic context or business environment from the observation of the economic reality.

- Ability to use logic and strategic reasoning to address real economic situations.

- Manage a set of basic quantitative tools and apply them to the assessment of economic and business situations.

- Select the appropriate theoretical framework to develop different types of analyses.

- Knowledge and understanding of quantitative tools for analysis, diagnosis, and economic prospection.

- Identify, classify, reason, argue and interpret the relationships between economic variables.

- Apply different regression methods and techniques of analysis using statistical software.

COURSE CONTENTS

1. ECONOMETRICS AND ECONOMIC DATA

1.1. Econometrics: concept and usefulness of econometrics.

1.2. Steps to build an econometric model.

1.3. Economic data structure.

1.4. Ceteris paribus assumption and the notion of causality.

2. LINEAR REGRESSION MODELS

2.1. Simple linear regression model (two-variables)

2.2. Multiple regression model.

2.3. Coefficients' interpretation with different functional forms.

2.4. Units of measurement.

3. PROPERTIES AND HYPOTHESES ASSOCIATED TO THE REGRESSION MODEL

3.1. Descriptive properties of the OLS estimators.

3.2. Goodness of fit.

3.3. Assumptions underlying the OLS method.

3.4. Probabilistic properties of the OLS estimators.

4. HYPOTHESES TESTS IN THE MULTIPLE REGRESSION MODEL

4.1. Introduction to hypothesis testing.

4.2. Hypothesis testing on a single parameter: the t statistic.

4.3. Hypothesis testing on a set of parameters (multiple linear constraints): The F statistic.

4.5. Prediction: punctual and interval.

5. MULTIPLE REGRESSION ANALYSIS WITH QUALITATIVE INFORMATION

5.1. Dummy variables.

5.2. Interpretation of coefficients of dummy variables.

5.3. Multiple categories.

5.4. Interactions involving dummy variables.

5.5. Testing for structural stability.

6. BREACH OF THE BASIC ASSUMPTIONS OF THE REGRESSION MODEL

6.1. Multicollinearity.

6.2. Normality.

6.3. Heteroscedasticity.

6.4. Autocorrelation.

WORKLOAD

ACTIVITIES	HOURS	ATTENDANCE REQUIRED
Lectures and class exercises	30	
Practical sessions and complementary activities	30	
Total class activities	**60**	**Yes**
Independent study, written and oral tests.	40	
Supervised autonomous study with tutorial support	50	
Total study activities	**90**	**No**
TOTAL	**150**	

TEACHING METHODOLOGY

Lecturers, class exercises and tutorials:

To conduct students in their learning process, the course is designed using the so called "blended learning" methodologies. Those involves **actively pushing content out of class to self-study time** providing the students with the appropriate tools to do so. Class time is optimized to include:

- Master class: time for the professor to highlight the main issues and those of a more difficult comprehension and to solve typical examples.
- Test: Time for the professor to **test the level of understanding** of the lectured content and provide feedback.
- Class exercises: Time for the students to solve "class exercise" on their own and in class time while receiving **feedback from the professor**.

This methodology also implies that **students must prepare class activities** (lectures, class exercises, and practical sessions) at home, **before each session**, using the material previously made available by the professor.

Finally, students will **attend at least two tutorials** in groups up to six people. Professor will give guidance, work with the students to detect possible loose points in the understanding of the subject and the student's progress. If necessary, professor will provide individualized reinforcement exercises that the students must deliver as it may be agreed.

Practical sessions:

The course has an applied approach; therefore, students are expected to use theory in a concrete, practical situation. To achieve this goal, practical sessions are devised as a **learning-by-doing** process. Students will be organized in teams and, after presenting each one with a case study to solve. Students must **manage their own**

class time on the peruse of an objective clearly stated at the beginning of each session while **professor carefully coaches** the process.

The statistical software used will be Gretl (free, open-source software available here: http://gretl.sourceforge.net/). Preparation of data sets, when necessary, will be carried out by the students using Excel (or compatible spread-sheet software).

Complementary activities:

Complementary activities vary each course, and they may include visiting companies or guest lecturers.

EVALUATION CRITERIA

Evaluation of students will take place through continuous assessment, partial exams, and the final exam.

Continuous assessment

It includes the assessment on the active participation in class and tutorials, exercises solved in class, and the resolution of the case study.

Partial exams

There will be two partial exam. To pass a partial exam score obtained in it by the students must be at least 5 points (over 10). Those students who pass a partial exam will eliminate the content covered in it from the final exam.

Final Exam (or synthesis test)

Each registration entitles two takes of the final exam: the final exam (1st call) and the recovery exam (2nd call).

In the 2nd call, partial exams will not be considered. Therefore, the recovery exam will include the whole content of the subject. It will be scored with up to 10 points, and 5 points are required to pass.

Exams will consist of a set of problems in different formats to be solved by applying theoretical concepts. Results must be discussed using econometric jargon in the context of the problem.

Students must keep to writing, grammar and orthography rules at their deliverables and evaluation exercises. These formal aspects will be taken into consideration when grading.

Retake of the subject (2nd call)

The synthesis test can be retaken by the end of the semester in the scheduled dates. Synthesis tests are compulsory and, as mentioned, passing them is a must to pass the subject.

Continuous assessment requires attendance and cannot be retaken. Thus, the mark obtained during the continuous assessment of the subject will be kept both for the first and the second call.

Pass requirements

Final mark scores between 0 and 10 (60% final exam score and 40% continuous assessment score). To pass the subject, the final mark must be at least 5 points. It is necessary to obtain a mark higher than 5 out of 10 in the final exam score (1st or 2nd call) to be combined with the continuous assessment. However, if the final exam is failed, the final mark obtained after applying the prior weighting will be a maximum of 4.5. Thus, if the exam is less than 5 and after applying the weighting the final mark is greater than 4.5, it will remain at that 4.5. If, on the other hand, this grade is less than 4.5, the grade obtained will be maintained.

Final mark is composed (except for students following the subject for second year, see below):

1.	**Continuous assessment score**	**40%.**
	- Active participation in class and tutorials	10%
	- Class exercises	10%
	- Case study	20%
2.	**Final Exam score (synthesis test)**	**60%**
	- Partial Exam I: if passed*	20%
	- Partial Exam II: if passed*	20%
	- Final Exam, depends on the student:	
	If passes both partial exams	20%
	If passes one partial, but fails the other	40%
	If fails both partial exams	60%

* 0% if not passed.

Students following the subject for a second year.

Those students that did not pass the subject in 1st or 2nd take and who **are not retaking the whole year**, will have to sign up for the subject again. They will have the right for a 3rd and a 4th take. Their evaluation will consist of:

- Continuous assessment: It will have a weight of 20% in the final mark and it will consist of multiple-choice tests. Students will receive specific instructions about the organization of tests and must contact the professor within the first three weeks from the beginning of the term.
- Final exam: The final exam will weight 80% in the final mark, will include all content of the subject, and will be scored with up to 10 points.

REFERENCES

Basic references:

- Basic Econometrics. Gujarati D.N. and Porter, D.C. 5th Edition McGraw-Hill/Irwin. New York 2009.

- Uriel, E. (2013). Introduction to econometrics. Electronic textbook, Valencia. (http://www.uv.es/~uriel/libroes.htm).