ECONOMETRICS

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’s 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.

Course Details

- **Code:** 35820
- **Degree:** Degree in Business Management
- **Mention:** Business Creation and Management – Itinerary Entrepreneurship
- **Character:** Compulsory
- **Year:** 3rd
- **ECTS:** 6

Prior Knowledge

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

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

International students are strongly recommended to review the syllabus on each of those subjects before registering in this course.

Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Tutorials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belén García Cárceles</td>
<td>Tuesday, 15:00 – 17:00</td>
</tr>
<tr>
<td><strong>Department</strong></td>
<td>(by appointment)</td>
</tr>
<tr>
<td>Economic Analysis</td>
<td></td>
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</tbody>
</table>
Competences

GENERAL 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. Stages in the econometric modelling process: examples.
1.3. Economic data structure.
1.4. Ceteris paribus assumption and the notion of causality.

2. The classical linear regression model

2.1. The simple linear regression model.
2.2. The multiple regression models.
2.3. Coefficients’ interpretation.
2.4. Units of measurement and functional forms.

3. Properties and hypotheses associated to the regression model

3.1. Descriptive properties of the regression.
3.2. Goodness of fit: measures, the determination coefficient and model selection criteria (AIC).
3.3. Assumptions of the classical linear model.
3.4. Probabilistic properties of the regression model.

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.
Work Load

**PRESENTIAL ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures and class exercises</td>
<td>30</td>
</tr>
<tr>
<td>Practical sessions and complementary activities</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total Presential Activities</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

**NON-PRESENTIAL ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity</th>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent study of the student and realization of written and oral tests.</td>
<td>40</td>
</tr>
<tr>
<td>Supervised autonomous study with tutorial support</td>
<td>50</td>
</tr>
<tr>
<td>• Preparations of lectures and class exercises.</td>
<td>30</td>
</tr>
<tr>
<td>• Group-tutorial.</td>
<td>2</td>
</tr>
<tr>
<td>• Individual preparation of practical sessions.</td>
<td>5</td>
</tr>
<tr>
<td>• Individual assignments.</td>
<td>9</td>
</tr>
<tr>
<td>• Individual final report of the case study.</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Non-Presential Activities</strong></td>
<td><strong>70</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>115</strong></td>
</tr>
</tbody>
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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 should 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 begin-
Evaluation of students will take place through continuous assessment and a synthesis exam. Final mark is composed (except for students following the subject for second time, see below):

- 40% from continuous assessment score (4 points):
  - Average score from 3 individual assignments (1 point).
  - Average score from 2 team reports of the case study (1 point).
  - Score from individual final report of the case study (1 point).
  - Active participation in class (1 point).
- 60% from synthesis exam score (6 points).
TOTAL 10 points.

**Continuous assessment:**
It’s based on the attendance, participation and involvement of the student during their active learning-by-doing process. It’s also based on the exercises carried out by the student during class and on the production of individual and group assignments with the subsequent presentation of results.

**Individual assignments**
Those tasks are aligned with the subject content and they are intended to provide effective practice to succeed in the synthesis test and ensure individual effort.

**Case study resolution**
At 2 different stages of development, teams will be requested to deliver their case studies using a defined template. The final report is also a predefined template that students must complete and deliver. It implies adding personal contributions to the team’s resolution of the case study and it is assessed as an individual assignment.

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

**Evaluation Criteria**

**Active participation in class**
Attendance and participation are essential. All students are expected to participate in class exercises which require students to review content previously to the class at home and they may be delivered as individual tasks before classes ends. Also, there will be discussions where relevant contributions are expected and assessed. Finally, whenever it’s possible, complementary activities will be organized, students will be requested to deliver a group task about to the activity that will be considered as a class exercise.

The attendance during the classes is compulsory for an optimal follow up of the subject. Thus, non-attendance to over a 15% of the sessions will involve that the student will not be assessed in the area of continuous assessment. Consequently, the maximum reachable mark will be the one obtained in the synthesis tests, with a weight of 60%.

**Synthesis tests (6 points over 10)**
Each registration entitles two takes of the synthesis test: the final exam (1st call) and the recovery exam (2nd call). The final exam (1st call) will include all contents of the subject. Students who fail the final exam will have to repeat it in the second call, including all contents of the subject.
Exams will consist on 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.

**Pass requirements**
Final mark scores between 0 and 10. 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 synthesis exam (1st or 2nd call) to be combined with the continuous assessment.
Students must keep to writing, grammar and orthography rules at their deliverables and evaluation tests. These formal aspects will be taken into consideration for their evaluation.

**Retake of the subject**
The synthesis tests 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 can’t be retaken. Thus, the mark obtained during the continuous assessment of the subject will be kept both for the first and for the second call.
**Students following the subject for a second year**
Those students that didn’t 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 on:
- Continuous assessment. It will have a weight of 20% in the final mark and it will consist on 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.
- Exam. The final exam will weight 80% in the final mark.

**References**

**Basic references:**

**Complementary references:**