

**1. General information****Course:** ECONOMETRIC METHODS AND MODELLING**Code:** 54323**Type:** CORE COURSE**ECTS credits:** 6**Degree:** 320 - UNDERGRADUATE DEGREE IN BUSINESS MANAGEMENT AND ADMINISTRATION (CR)**Academic year:** 2023-24**Center:** 403 - FACULTY OF LAW AND SOCIAL SCIENCES OF C. REAL**Group(s):** 20 21 29**Year:** 3**Duration:** C2**Main language:** Spanish**Second language:****Use of additional languages:****English Friendly:** Y**Web site:****Bilingual:** N**Lecturer:** FERNANDO EVARISTO CALLEJAS ALBIÑANA - Group(s): 20 29

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**2. Pre-Requisites**

Necessary requirements:

- 1.- Matrix algebra
- 2.- Statistical inference
- 3.- Introduction to econometrics: Basic model of simple linear regression.
- 4.- Economic theory.
- 5.- Economic structure and national accounting

**3. Justification in the curriculum, relation to other subjects and to the profession**

- Introduce the student in the theoretical basic knowledge of the Econometric Methods.
- Management of basic techniques and tools for the quantification of relationships between relevant variables in the business world.
- Ability to recognize a problem, analyze it and solve it using the scientific method of modeling.
- Management of data and external and internal indicators of the company relevant for decision making.
- Apply the acquired theoretical knowledge to the realization of a paper in which the student will be able to elaborate an econometric model under the direct supervision of the professor and with the support of the computer equipment.
- Acquire the capacity for debate and informed discussion about the issues and problems that affect the business decision-making process from a quantitative perspective.
- Train the business economist to deal with situations of prediction and simulation of company policies and as a basis for making decisions.
- Design and construction of prediction models in the short-term and medium-term, of the strategic variables of the company: sales, costs, human resources, prices, business investments, etc.
- Quantify the effects of business policy changes on business results (eg: impact of advertising campaigns, changes in the product, in the organization, etc.) and measure the effectiveness of the implemented policies.
- Implement the relations and relevant variables of strategic planning in mathematical-econometric models that allow establishing alternative scenarios for the time horizon and evaluate the different policies.

**4. Degree competences achieved in this course**

**Course competences**

| Code | Description                                                                                                                                                                                                                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E05  | Develop the ability to analyze any information on the situation and possible development of a company and transform it into a business opportunity.                                                                                                                                                                         |
| E07  | Understand the economic environment as a result and application of theoretical or formal representations on how the economy works. To do so, it will be necessary to be able to understand and use common handbooks, as well as articles and, in general, leading edge bibliography in the core subjects of the curriculum. |
| E13  | Ability to make logical representative models of the business reality                                                                                                                                                                                                                                                       |
| G01  | Possession of the skills needed for continuous, self-led, independent learning, which will allow students to develop the learning abilities needed to undertake further study with a high degree of independence.                                                                                                           |
| G04  | Ability to use and develop information and communication technologies and to apply them to the corresponding business department by using specific programmes for these business areas.                                                                                                                                     |

**5. Objectives or Learning Outcomes****Course learning outcomes**

Description

Work out problems in creative and innovative ways.

Know the tools and methods for the quantitative analysis of the company and its environment, including models for business decision making as well as economic forecast models.

**Additional outcomes****6. Units / Contents****Unit 1: Expand of the basic regression model****Unit 2: Structural change****Unit 3: Collinearity****Unit 4: Models with autocorrelation****Unit 5: Heteroscedasticity models****Unit 6: Dynamic models (I): Distribution of delays****Unit 7: Dynamic models (II): Time series models****Unit 8: Multiple-equation models: specification****Unit 9: Multiple-equation models: estimating****Unit 10: Use of multiple-equation models: prediction and simulation****Unit 11: Business models and strategic planning****Unit 12: Prediction, simulation and strategic information systems****7. Activities, Units/Modules and Methodology**

| Training Activity                              | Methodology                          | Related Competences<br>(only degrees before RD<br>822/2021) | ECTS                                        | Hours      | As | Com | Description |
|------------------------------------------------|--------------------------------------|-------------------------------------------------------------|---------------------------------------------|------------|----|-----|-------------|
| Class Attendance (theory) [ON-SITE]            | Lectures                             | E05 E07                                                     | 1.2                                         | 30         | N  | -   |             |
| Computer room practice [ON-SITE]               | project-based learning               | E13 G04                                                     | 0.8                                         | 20         | N  | -   |             |
| Writing of reports or projects [OFF-SITE]      | Cooperative / Collaborative Learning | E05 E07 G04                                                 | 0.4                                         | 10         | Y  | Y   |             |
| In-class Debates and forums [ON-SITE]          | Group Work                           | E05 E07                                                     | 0.32                                        | 8          | Y  | N   |             |
| Study and Exam Preparation [OFF-SITE]          | Self-study                           | G01                                                         | 3.2                                         | 80         | N  | -   |             |
| Final test [ON-SITE]                           |                                      | E05 E07 E13 G01 G04                                         | 0.08                                        | 2          | Y  | Y   |             |
| <b>Total:</b>                                  |                                      |                                                             | <b>6</b>                                    | <b>150</b> |    |     |             |
| <b>Total credits of in-class work: 2.4</b>     |                                      |                                                             | <b>Total class time hours: 60</b>           |            |    |     |             |
| <b>Total credits of out of class work: 3.6</b> |                                      |                                                             | <b>Total hours of out of class work: 90</b> |            |    |     |             |

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

**8. Evaluation criteria and Grading System**

| Evaluation System             | Continuous assessment | Non-continuous evaluation* | Description                                                                                                                                                                                 |
|-------------------------------|-----------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Final test                    | 70.00%                | 100.00%                    | The preparation of the work is mandatory, whether in face-to-face or not, so the final test, for all, will be 70%. It is necessary to obtain a 4 in the exam to be able to pass the subject |
| Other methods of assessment   | 20.00%                | 0.00%                      | .                                                                                                                                                                                           |
| Oral presentations assessment | 10.00%                | 0.00%                      | .                                                                                                                                                                                           |
| <b>Total:</b>                 | <b>100.00%</b>        | <b>100.00%</b>             |                                                                                                                                                                                             |

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

| 9. Assignments, course calendar and important dates                             |       |
|---------------------------------------------------------------------------------|-------|
| Not related to the syllabus/contents                                            |       |
| Hours                                                                           | hours |
| In-class Debates and forums [PRESENCIAL][Group Work]                            | 8     |
| Final test [PRESENCIAL][]                                                       | 2     |
| Unit 1 (de 12): Expand of the basic regression model                            |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 3     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 1     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | .5    |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 4     |
| Unit 2 (de 12): Structural change                                               |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 3     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 1     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | .5    |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 6     |
| Unit 3 (de 12): Collinearity                                                    |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 1     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | .5    |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 5     |
| Unit 4 (de 12): Models with autocorrelation                                     |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 1     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 6     |
| Unit 5 (de 12): Heteroscedasticity models                                       |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 5     |
| Unit 6 (de 12): Dynamic models (I): Distribution of delays                      |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 5     |
| Unit 7 (de 12): Dynamic models (II): Time series models                         |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 8     |
| Unit 8 (de 12): Multiple-equation models: specification                         |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 4     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 10    |
| Unit 9 (de 12): Multiple-equation models: estimating                            |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 4     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 8     |
| Unit 10 (de 12): Use of multiple-equation models: prediction and simulation     |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning] | 1     |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                               | 8     |
| Unit 11 (de 12): Business models and strategic planning                         |       |
| Activities                                                                      | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                | 2     |
| Computer room practice [PRESENCIAL][project-based learning]                     | 2     |

|                                                                                  |              |
|----------------------------------------------------------------------------------|--------------|
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]  | 1            |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                                | 10           |
| <b>Unit 12 (de 12): Prediction, simulation and strategic information systems</b> |              |
| <b>Activities</b>                                                                | <b>Hours</b> |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                 | 2            |
| Computer room practice [PRESENCIAL][project-based learning]                      | 2            |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]  | .5           |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                                | 5            |
| <b>Global activity</b>                                                           |              |
| <b>Activities</b>                                                                | <b>hours</b> |
| In-class Debates and forums [PRESENCIAL][Group Work]                             | 8            |
| Class Attendance (theory) [PRESENCIAL][Lectures]                                 | 30           |
| Computer room practice [PRESENCIAL][project-based learning]                      | 20           |
| Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]  | 10           |
| Study and Exam Preparation [AUTÓNOMA][Self-study]                                | 80           |
| Final test [PRESENCIAL][]                                                        | 2            |
| <b>Total horas: 150</b>                                                          |              |

| 10. Bibliography and Sources                   |                                                   |                            |             |               |      |                                                          |
|------------------------------------------------|---------------------------------------------------|----------------------------|-------------|---------------|------|----------------------------------------------------------|
| Author(s)                                      | Title/Link                                        | Publishing house           | Citv        | ISBN          | Year | Description                                              |
| Callejas Albiñana, F.E.y Martínez Rodríguez, I | Diapositivas y presentaciones Archivos Moodle     |                            | Ciudad Real |               | 2023 | Documentación a disposición de los estudiantes en Moodle |
| Greene, Willian H (1951)                       | Análisis econométrico                             | Prentice Hall              | Madrid      | 84-8322-007-5 | 1999 |                                                          |
| Intriligator, Michael D.                       | Modelos econométricos, técnicas y aplicaciones    | Fondo de Cultura Económica |             | 968-16-3140-4 | 1990 |                                                          |
| Gujarati, Damodar N.                           | Econometría                                       | McGraw-Hill                | Mexico      | 970-10-3971-8 | 2003 |                                                          |
| Wooldridge, Jeffrey M.                         | Introducción a la econometría: un enfoque moderno | Thomson                    |             | 84-9732-268-1 | 2006 |                                                          |
| Pulido SanRomán, A. y PérezGarcía, J.          | Modelos econométricos                             | Piramide                   | Madrid      | 84-368-1534-3 | 2001 |                                                          |