

**COURSE DATA****Data Subject**

Code	36162
Name	Data analysis
Cycle	Grade
ECTS Credits	6.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. Period
1316 - Degree in Economics	Faculty of Economics	4 First term

Subject-matter

Degree	Subject-matter	Character
1316 - Degree in Economics	21 - Pathway: industrial and business economics	Optional

Coordination

Name	Department
RUIZ PONCE, FELIX	110 - Applied Economics

SUMMARY

Data Analysis is a subject assigned to the area of Quantitative Methods for Economics and Business (Department of Applied Economics), which is taught in the term period of the fourth year of the Degree in Economics, with a total teaching load of 6 ECTS credits.

This subject is included, as an optional subject, in the curricular intensification of Industrial and Business Economics although, due to its content, it is interesting for all students of the Degree in Economics.

The necessity of using instruments to analyse data and economic information, motivates the inclusion, in the curriculum of the Degree in Economics, of the module of Quantitative Methods, being the subject Data Analysis part of it, together with the Statistics I and Statistics II. The subject will help the student to improve their ability to search, select and evaluate the information, as well as their capacity for analysing, synthesising and decision making.



Regarding the contents, they include a vision of the data analysis strategy, the development of some multivariate analysis techniques for data analysis, as well as an introduction to discrete choice models and panel data.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

It will be considered, for the development of this subject, that the students know and handle with fluidity the concepts developed in the core subjects of Statistics that are taught in the 1st and 2nd year of the degree. Likewise, it will be convenient to have basic computer skills.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)

1316 - Degree in Economics

- Be able to collect and analyse information.
- Have decision-making skills and be able to apply knowledge to practice.
- Be able to learn autonomously.
- Be able to use ICTs.
- Apply the principles of economic analysis (rational decision) to the diagnosis and resolution of problems.
- Understand and apply the scientific method, which involves formulating hypotheses, deducing verifiable results and contrasting them with empirical and experimental evidence.
- Know and understand the basic quantitative tools for economic analysis, diagnosis and prospection, such as mathematics, statistics and econometrics.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

The results that the student is expected to acquire in this subject are the following:

- Search for information and knowledge from statistical sources. Management of statistical data and databases for the study of the economy.
- Abstraction and processing of information for later use in computer packages.



- Identification, classification, reasoning, argumentation and interpretation of the relationships between economic variables.
- Recognition of an economic problem based on the observation of economic reality.
- Increased in the ability to use logical / strategic reasoning to address real situations in the economic world.
- Management of basic quantitative tools and their application to the economic environment.
- Selection of a theoretical framework for the development of the analysis.
- Extraction of useful information from data and quantitative models.
- Synthesize, abstract, provide conclusions or economic implications from the performed analysis.

DESCRIPTION OF CONTENTS

1. THE GENERAL DATA ANALYSIS STRATEGY

THEME 1: STATISTICAL RESEARCH

- Introduction.
- Initial exploration of the data.
- Statistical analysis of the information.
- Statistical sources.
- Analysis instruments

2. ANALYSIS OF MULTIVARIABLE DATA

THEME 2: REDUCTION OF THE DIMENSION

- Introduction: The factor analysis model.
- Methods of extracting factors. Principal components method.
- Interpretation and rotation of factors.
- Ratings of the factors.
- Application with SPSS

THEME 3: GROUPING BY SIMILARITIES

1. Introduction. Measures of similarity and dissimilarity.
2. Methods of grouping: hierarchical and non-hierarchical grouping.
3. Hierarchical tree diagram.
4. Determination of the number of groups to obtain.
5. Application with the SPSS.

**3. ANALYSIS OF CATEGORICAL DATA****THEME 4: MODELING OF VARIABLES DISCRETE RESPONSE**

1. Introduction. Latent variable model.
2. Binomial variables: probit and logit models.
3. Multinomial variables: probit and logit models.
4. Nested and hierarchical models: nested logit model and sequential models.
5. Variable of ordered response: ordered probit.
6. Application with the SPSS.

THEME 5. MODELS WITH LIMITED DEPENDENT VARIABLE

1. Introduction. Dependent variables not fully observable.
2. Tobit model.
3. Continuous dependent variable model with sample separation: selection bias. Two-stage Heckmans method.
4. Application with the SPSS

4. PANEL DATA ANALYSIS**THEME 6: INTRODUCTION TO PANEL DATA**

1. The statistical nature of the panel data
2. Unobservable heterogeneity in cross section models
3. Variance components in transition between states models
4. Models with outdated dependent variable
5. Application with the SPSS

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Classroom practices	30,00	100
Development of individual work	10,00	0
Study and independent work	20,00	0
Preparation of evaluation activities	10,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	25,00	0
Resolution of case studies	15,00	0
TOTAL	150,00	



TEACHING METHODOLOGY

The subject has a theoretical-practical nature, both aspects being fully interrelated.

The theoretical knowledge is taught through a participatory master class. This knowledge relies on practical examples so that the student can quickly observe the applicability of these concepts. This teaching methodology offers the advantages of a master class but enhancing the participation of students, involving them in the contents through their contributions.

The practical part is developed mainly through the use of the statistical package SPSS for the resolution of problems, posed on real data, for which it is advisable to use the developed methods. The participation of the students in this part of the subject is basic since they must be the ones who, following the indications of the teacher and under their tutelage, develop and solve the practical cases presented.

In case of considering relevant, there will be cases to develop outside of classroom hours, where students must apply all acquired knowledge.

All the necessary material to follow up the classes of the classes is sent, with sufficient advance, to the student through the virtual classroom.

EVALUATION

The evaluation of the students learning of this subject will be done through a double process:

- a) A written exam that evaluates the level of scope of learning outcomes and especially those focused on specific competences regarding contents and application. This test will be valued between 60% and 80% of the total score.
- b) The continuous assessment of the student, based on their participation and involvement in the teaching-learning process. The continuous evaluation aims to develop the skills of the students and stimulate daily work and it will be based on an assessment of the follow-up made by the students of the subject, through participation in the classes and / or individual reports and work, presented in written and oral form. The continuous evaluation will be between 40% and 20% of the total grade. By their very nature, continuous assessment activities are NOT recoverable.

The specific criteria and processes that will be used for the evaluation, as well as their specific numerical weight, will be based on the number of students finally enrolled and will be advertised properly at the beginning of the course.

REFERENCES



Basic

- Pérez López, C. (2013). IBM SPSS. Estadística Aplicada. Conceptos y ejercicios resueltos. Garceta grupo editorial. Madrid.
- Pérez López, C. (2014): Técnicas Estadísticas Predictivas con IBM SPSS. Modelos. Garceta grupo editorial. Madrid.
- Uriel Jiménez, E.; Aldás Manzano, J. (2005). Análisis multivariante aplicado: aplicaciones al marketing, investigación de mercados, economía, dirección de empresas y turismo. Thomson, D.L. Madrid.
- Mateos-Aparicio Morales, G.; Hernández Estrada, A. (2021). Análisis multivariante de datos. Cómo buscar patrones de comportamiento en BIG DATA. Ediciones Pirámide. Madrid.

Additional

- CEACES, Proyecto (Contenedor Hipermedia de Estadística Aplicada a las Ciencias Económicas y Sociales). Universitat de València. ON LINE: <http://www.uv.es/ceaces>
- Ferrán, Magdalena: SPSS para Windows: Programación y Análisis Estadístico. Madrid: Mc Graw Hill.
- Pérez López, C. (2013). Análisis Multivariante de Datos. Aplicaciones con IBM SPP, SAS y STATGRAPHICS. Garceta grupo editorial. Madrid.
- Pérez López, C. (2009). Técnicas de Análisis de Datos con SPSS 15. Prentice Hall. Madrid.