



Teaching Guide

| Identifying Data | | | | | 2022/23 |
|---------------------|--|--------|------------------|---------|---------|
| Subject (*) | Multivariate Analysis of Social Data | Code | 615G01206 | | |
| Study programme | Grao en Socioloxía | | | | |
| Descriptors | | | | | |
| Cycle | Period | Year | Type | Credits | |
| Graduate | 2nd four-month period | Second | Obligatory | 6 | |
| Language | Spanish | | | | |
| Teaching method | Face-to-face | | | | |
| Prerequisites | | | | | |
| Department | Socioloxía e Ciencias da Comunicación | | | | |
| Coordinador | Cotillo Pereira, Alberto | E-mail | a.cotillo@udc.es | | |
| Lecturers | Cotillo Pereira, Alberto | E-mail | a.cotillo@udc.es | | |
| Web | | | | | |
| General description | <p>The subject of Multivariate Analysis of Social Data aims to provide conceptual and practical tools needed to analyze data in highly complex environments in which univariate and bivariate tools are insufficient, that is, in the vast majority of social situations. It is possible that there is no social phenomenon that can be understood properly only from the analysis of the distribution of a variable or the relationship between two variables. This subject has direct application in any situation involving research serving more than two variables. His approach is eminently sociological as it is aimed to train graduates in sociology. The research papers, the case studies and the examples that will be used will be drawn from the sociological research flow and only in this flow they become meaningful.</p> | | | | |

Study programme competences

| Code | Study programme competences |
|------|---|
| A5 | Aprendizaje de los conceptos y de las técnicas estadísticas aplicadas a la sociedad humana. |
| A7 | Conocimiento y dominio de la metodología de las ciencias sociales y de sus técnicas básicas y avanzadas (cuantitativas y cualitativas) de investigación social; con especial atención a los aspectos de muestreo y de los programas informáticos de aplicación. |
| A14 | Capacidades en elaborar, utilizar, e interpretar indicadores sociales e instrumentos de medición social. |
| A15 | Conocimientos y habilidades para plantear y desarrollar una investigación aplicada en las diferentes áreas de la sociedad. |
| A16 | Conocimientos y habilidades técnicas para la producción y el análisis de los datos cuantitativos y cualitativos. |
| A26 | Saber elegir las técnicas de investigación social (cuantitativas y cualitativas) pertinentes en cada momento. |
| B3 | Capacidad de análisis y síntesis. |
| B4 | Resolución de problemas. |
| B5 | Capacidad de gestión de la información. |
| B6 | Comunicación oral y escrita en la lengua nativa. |
| B7 | Conocimientos de informática relativos al ámbito de estudio. |
| B12 | Trabajo en equipo. |
| B21 | Aprendizaje autónomo. |
| B27 | Capacidades en reconocer la complejidad de los fenómenos sociales. |
| C1 | Expresarse correctamente, tanto de forma oral como escrita, en las lenguas oficiales de la comunidad autónoma. |
| C3 | Utilizar las herramientas básicas de las tecnologías de la información y las comunicaciones (TIC) necesarias para el ejercicio de su profesión y para el aprendizaje a lo largo de su vida. |

Learning outcomes

| Learning outcomes | Study programme competences | | |
|---|-----------------------------|-----|--|
| Upon successful completion of this course, students will be able to select the multivariate analysis technique appropriate to the research question | A5 | B21 | |
| | A7 | | |
| | A26 | | |



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|---|--------------------------------|------------------------|----|
| Upon successful completion of this course, students will be able to handle the SPSS statistical package for the analysis of social data | A7 A14 A16 | B4 B7 B21 | C3 |
| Upon successful completion of this course, students will be able to differentiate the phases and tasks involved in the systematic application of each of the multivariate analysis techniques exposed | A7 | B21 | |
| Upon successful completion of this course, students will be able to analyze social data of different types by applying multivariate analysis techniques | A5 A7 A16 | B3 B27 | C1 |
| Upon successful completion of this course, students will be able to interpret the results of research involving the use of multivariate analysis techniques | A5 A7 A16 | B3 B27 | C1 |
| Upon successful completion of this course, students will be able to extract the relevant information from large sets of social data | A15 A16 | B3 B5 B12 B27 | C1 |
| Upon successful completion of this course, students will be able to exhibit in public a scientific article in which the studied techniques of multivariate analysis are applied | | B3 B6 | C1 |
| Upon successful completion of this course, students will be able to apply the techniques studied to real research situations | A7 A14 A15 A16 A26 | B3 B4 B12 | C1 |

| Contents | |
|---|--|
| Topic | Sub-topic |
| LESSON 1: EXPLORATORY DATA ANALYSIS | Exploratory data analysis with SPSS. Descriptive statistics. Graphic examination of the data: Boxplots and Stem-and-Leaf Graphics. Construction and interpretation of tables. Construction and interpretation of tables based on multiple responses. Social data applications. |
| LESSON 2: MULTIVARIATE ANALYSIS TECHNIQUES CLASSIFICATION | Relevance of multivariate analysis. Definition. Measurement types. Types of variables. Relationship. Description of multivariate analysis techniques. Classification criteria. Types of research problems. |
| LESSON 3: SIMPLE AND MULTIPLE REGRESSION ANALYSIS | Definition of regression analysis. Least squares criterion. Forecast errors. Predictive ability. Special features of the multiple regression analysis. Variable selection methods. The problem of multicollinearity. The research process: objectives, design, assumptions, extraction, interpretation and validation. |
| LESSON 4: FACTOR AND PRINCIPAL COMPONENT ANALYSIS | Historical background. Definition. Factor solution. Common and specific variance. Factor Analysis vs. Principal component analysis. Applications and uses. The research process: objectives, design, assumptions, extraction, interpretation and validation. |
| LESSON 5: CORRESPONDENCE ANALYSIS | Scopes. Definition of correspondence analysis. Research objectives. Limitations of correspondence analysis. The basic structure of the data matrix. Central concepts. Multiple correspondence analysis. The research process: objectives, design, assumptions, extraction, interpretation and validation. |
| LESSON 6: CLUSTER ANALYSIS | Definition of cluster analysis. Objectives. Procedure. Similarity measures. Clustering methods. Limitations of cluster analysis. The research process: objectives, design, assumptions, extraction, interpretation and validation. |



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| LESSON 7: DISCRIMINANT ANALYSIS | Historical background. Definition of discriminant analysis. Objectives. Multivariate profiles. Discriminating variables. Discriminant functions. Reclassification. The research process: objectives, design, assumptions, extraction, interpretation and validation. |
| LESSON 8: LOGISTIC REGRESSION ANALYSIS | The logic of logistic regression. Preconditions for logistic regression. Logistic regression assumptions. Extraction and estimation of regression model fit. Interpretation of logistic regression coefficients. Probit analysis. The research process: objectives, design, assumptions, extraction, interpretation and validation. |

| Planning | | | | |
|---------------------------------|--|----------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies | Ordinary class hours | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A5 A7 A26 B21 | 30 | 0 | 30 |
| ICT practicals | A5 A7 A14 A16 B3 B6 B7 B27 C1 C3 | 10 | 30 | 40 |
| Mixed objective/subjective test | A5 A7 A26 B6 B21 | 2 | 38 | 40 |
| Supervised projects | A5 A7 A14 A15 A16 A26 B3 B4 B5 B6 B12 B27 C1 | 0 | 30 | 30 |
| Personalized attention | | 10 | 0 | 10 |

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies | |
|---------------------------------|---|
| Methodologies | Description |
| Guest lecture / keynote speech | The explanation of the theoretical content of each of the topics will take place in the classroom from previous readings that students had to perform. These readings are the basic bibliography of the subject and are available in the school library. The objective test will be based on the knowledge of those basic readings. |
| ICT practicals | Throughout the development of the sessions, some ICT practices will be made about any of the analytical techniques taught. The completion of each practice will involve mastering any computer application for data analysis. |
| Mixed objective/subjective test | At the end of the sessions there will be a theoretical mixed test for students to show their understanding of the concepts studied. |
| Supervised projects | The teacher will assign a research topic to each group in order to apply the analytical techniques studied to a secondary database. This supervised work will be done in groups of no more than three students. |

| Personalized attention | |
|------------------------|--|
| Methodologies | Description |
| ICT practicals | Practices through ICT will have personalized attention from the teacher in the classroom. |
| Supervised projects | Throughout the performance of the tutored project, students must attend at least twice tutorials. That tutored project will be done in groups of no more than three students. As far as possible it will be avoided that the students do the work alone. |

| Assessment | | | |
|---------------------------------|------------------|---|---------------|
| Methodologies | Competencies | Description | Qualification |
| Mixed objective/subjective test | A5 A7 A26 B6 B21 | The mixed test will consist of an exam at the end of the lessons. All students who do not wish to be evaluated through continuous evaluation may take the exams of the official announcements. That exam will have a theoretical and a practical part. | 50 |



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|---------------------|--|--|----|
| ICT practicals | A5 A7 A14 A16 B3 B6 B7 B27 C1 C3 | Throughout the course, practices that will involve the application of the studied technique to a particular case will be held. | 30 |
| Supervised projects | A5 A7 A14 A15 A16 A26 B3 B4 B5 B6 B12 B27 C1 | The supervised project will consist in the performance of a research work from the beginning to the end. Thus, students should use software for data processing, analyze the results and write the research report. Teamwork is fostered, so that work must be done in groups of two or three pupils. | 20 |

Assessment comments



For the purposes of the evaluation in the subject, a distinction will be made between students in continuous evaluation and students in non-continuous evaluation. Those students who do not deliver any of the assessable activities (practicals, supervised work or exam) will be considered to have opted for the non-continuous assessment. Students who submit some practice, the supervised work and the exam will be understood to have opted for continuous assessment.

The evaluation of the effort of the students who choose the continuous evaluation will be based on a system of points that they will have to accumulate throughout the semester. The maximum number of points that students can obtain will be 100 (30 in the practices, 20 in the work and 50 in the mixed test). Their final grade will depend directly on the number of points they accumulate. Students in the continuous assessment will successfully pass the subject when they meet each and every one of the following three conditions: (1) attend at least 75% of the classes in which attendance is controlled; (2) accumulate 50 or more points and (3) obtain in each of the tests, at least, a third of the points in play (10 in practices, 7 in supervised work and 17 in the exam). In some of the classes the teacher will pass a signature sheet to the students to control their attendance.

Students in the non-continuous assessment should only take the exam of the official call in June. To pass, they must obtain at least 50 points to pass, since the theoretical part will award a maximum of 50 points and the practical part will award a maximum of 25 points.

On the second opportunity in July, no distinction will be made between students in continuous assessment or not. The grades of any of the practices, assignments or any other assessable activity from past courses will not be saved. In no case will the grades obtained in any of the assessable activities of an opportunity be saved in any of the others.



The teacher reserves the right
to make changes along the course, provided they are not in contradiction with
any of the information contained herein.



Sources of information

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| Basic | <ul style="list-style-type: none">- Hair, Joseph F.; Anderson, Rolph E.; Tatham, Ronald L. y Black, William C. (2001). Análisis multivariante. Madrid. Prentice-Hall- Díaz de Rada, Vidal (2002). Técnicas de análisis multivariante para investigación social y comercial. Madrid. Ra-Ma- Cea D'Ancona, M. A. (2002). Análisis multivariable. Teoría y práctica en la investigación social. Madrid. Síntesis- Bisquerra Alzina, Rafael (1989). Introducción conceptual al análisis multivariable. Barcelona. PPU- Pardo Merino, A. y Ruiz Díaz, M.A. (2002). SPSS 11. Guía para el análisis de datos. Madrid. McGraw-Hill |
| Complementary | <ul style="list-style-type: none">- Levy Mangin, J.P. y Varela Mallou, J. (2003). Análisis multivariable para las Ciencias Sociales. Madrid. Prentice-Hall- Peña, Daniel (2002). Análisis de datos multivariantes. Madrid. McGraw-Hill- Pérez López, César (2009). Análisis de datos. Técnicas con SPSS 15. Madrid. Prentice-Hall- Pérez López, César (2004). Técnicas de análisis multivariante de datos. Aplicaciones con SPSS. Madrid. Pearson Education |

Recommendations

Subjects that it is recommended to have taken before

Statistics Applied to the social sciences 1/615G01101

Social Research Methods and Techniques/615G01105

Statistics Applied to the social sciences 2/615G01201

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.