Teaching Guide

Identifying Data				2024/25
Subject (*)	Multivariate Analysis of Social Data		Code	615G01206
Study programme	Grao en Socioloxia			

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	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.			

Study programme competences / results	
Code	Study programme competences / results
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 produción 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 / results	
Upon successful completion of this course, students will be able to select the multivariate analysis technique appropriate to the research question	A5 A7 A26	B21

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.

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 / Results	Teaching hours (in-person & virtual)	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 Supervised projects	Practices through ICT will have personalized attention from the teacher in the classroom. 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 / Results	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

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.
Students in continuous evaluation must
submit a form with their data before the indicated date. Otherwise, it will be
understood that they opted for non-continuous evaluation.
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).
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. 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.
The teacher reserves the right to make
changes along the course, provided they are not in contradiction with any of
the information contained herein.
Regarding the continuous or
non-continuous evaluation both in June and July, as well as with respect in
accordance with current legislation.

Sources of information

Basic	- 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	- 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