Teaching Guide				
Identifying Data				2017/18
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	Obligatoria	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	
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 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		
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: ANALYTICAL TECHNIQUES AS A REFLECTION OF THE RESEARCH PROBLEM	Types of problems and research situations. Examples.
LESSON 2. BASIC PROCEDURES IN SPSS	SPSS windows: Data Editor window. Viewer window. Editor of pivot tables window. Graph Editor window. Text editor window. Syntax Editor window. SPSS for Windows menus: (1) common menus: File, Edit, View, Analyze, Graphics, Utilities, Window, Help; (2) Specific Menus Data Editor: Data Transform; (3) Specific pivot tables editor menus: Insert, Pivot, Format; (4) Specific Menus Graph Editor: Gallery, Design, Series, Format, Graphics; (5) specific text editor Menu: Insert; (6) Specific Menus syntax editor: Run. Toolbars SPSS for Windows: Open, Save, Print, Recover, Undo, Redo, Go to graphic, Go to Case, Variables, Search, Insert cases, Insert variables, Split File. Weight cases. Select cases. Value Labels. Use sets. SPSS Status bar for Windows. SPSS Options for Windows. Preparing data for analysis. Organization of data for analysis. Using a word processor to enter data. Creating a command file to read data. Data online. Using SPSS Data Editor. Save/archive data in SPSS. Using SPSS results into other applications.
LESSON 3: 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 4: 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 5: 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 6: 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 7: 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 8: 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 9: 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 10: 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	15	0	15
ICT practicals	A5 A7 A14 A16 B3 B7 B27 C1 C3	40	0	40
Objective test	A5 A7 A26 B21	0	40	40
Oral presentation	B3 B6 C1	15	10	25
Supervised projects	A5 A7 A14 A15 A16 A26 B3 B4 B5 B12 B27 C1	0	20	20
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.
Objective test	At the end of the sessions there will be a theoretical objective test for students to show their understanding of the concepts studied.
Oral presentation	The students, organized in groups of three, will present a research paper that used any of the studied techniques or their own supervised projects. The teacher will provide students both the text and a exposure common script.

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**	**Description**	**Qualification**
Objective test	A5 A7 A26 B21	The objective test will consist of various exams at the end of each lesson. 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.	40
ICT practicals	A5 A7 A14 A16 B3 B7 B27 C1 C3	Throughout the course, practices that will involve the application of the studied technique to a particular case will be held.	25
Supervised projects	A5 A7 A14 A15 A16 A26 B3 B4 B5 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
Oral presentation	B3 B6 C1	The students, organized in groups of three, will present a research paper that used any of the studied techniques or their own supervised projects. The teacher will provide students both the text and a exposure common script.	15

Assessment comments

At the beginning of the course students
must choose one of two ways: either continuous assessment or assessment by
examination on the official date. Those opting for the latter route will only
have to present a theoretical and practical examination on the official date.
Students who choose the path of continuous evaluation may not be presented for
consideration by the official date in June. It is understood that chose not
continuous assessment those students who did not communicate to the teacher by
e-mail their choice by continuous assessment before February 15, 2018.
The evaluation of the efforts of students
who have opted for continuous assessment will be based on a system of points
that have to be accumulated throughout the semester. The maximum number of points
that students can get will be 100 on continuous assessment and 80 in
non-continuous assessment. Their final score will depend directly on the number
of points they accumulate.
For students in the continuous evaluation,
four of activities in which they can accumulate points: an oral presentation in
groups, ITC practicals in the classroom, a supervised group project and an objective test about the theoretical
content of the subject. The maximum number of points in each of these
activities will be: 15 in the oral presentation, 20 in the supervised project, 25 in the ICT practicals, and
40 points in the objective test.
In some classes the teacher will pass a
signature sheet to monitor student attendance.
Students in the continuous evaluation,
will approve the subject if they meet each and every one of the following three
conditions: (1) to attend at least 75% of classes in which attendance was
monitored; (2) to accumulate 50 or more points and (3) to obtain in each of the methodologies, at least a third of the points involved (5 in the oral
presentation, 7 in the supervised project, 8 in the ICT practicals, and 13 on the objective test).
Students in non-continuous evaluation must
obtain at least 50 points to pass, since the theoretical part will involve a
maximum 45 points and the practical part will involve a maximum of 35 points.
This will also be applied in the official opportunity
of July to students in non continuous evaluation.
The ratings of any of the practices, the
group project or any other previous courses will not be saved. In no way,
scores on any of the teaching activities in an opportunity will 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	
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

(*)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.