UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: STATISTICAL DATA ANALYSIS
Type: ELECTIVE
Degree: 316 - UNDERGRADUATE DEGREE IN ECONOMICS
Center: 5 - FACULTY OF ECONOMICS AND BUSINESS
Year: 4
Main language: Spanish
Use of additional languages:
Web site:

Code: 53341
ECTS credits: 4.5
Academic year: 2020-21
Group(s): 10
Duration: First semester
Second language: English
English Friendly: Y
Bilingual: N

Lecturer: **ESTEBAN ALFARO CORTES** - Group(s): **10**

Building/Office	Department	Phone number	Email	Office hours
Facultad de Ciencias Económicas y Empresariales. Despacho 3.14	ECONOMÍA APLICADA I	926053094	esteban.alfaro@uclm.es	

2. Pre-Requisites

It is recommended to have coursed the subjects on Statistics for Economics and Statistical Inference

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

Today it is very common, in the world of Economics and Business, to have a great amount of data and manage computer tools for proper extraction of the statistical information they contain.
In this process, the knowledge and use of appropriate statistical techniques is fundamental to the discovery of new and meaningful relationships and behavior patterns within the data. The aim of the course is to provide students with the tools necessary for the representation, description and extraction of patterns and relationships between variables in multidimensional data, which is known in the statistical literature as "data mining".

4. Degree competences achieved in this course

Course competences

Code	Description
E03	Ability to find economic data and select relevant facts.
E06	Application of profesional criteria to the analysis of problems, based on the use of technical tools.
E11	Diagnosis and assessment skills to conduct structural and cyclical reports, as well as economic forecast summaries on the reality of the economy in Spain, the European Union and in any of the product sectors and factor markets. To do so, it will be necessary to understand and use common handbooks, as well as articles and, in general, leading edge bibliography in the core subjects of the curriculum.
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.
G03	Develop oral and written communication skills in order to prepare reports, research projects and business projects and defend them before any commission or group of professionals (specialised or non-specialised) in more than one language, by collecting relevant evidence and interpreting it appropriately so as to reach conclusions.
G04	Ability for the use and development of information and communication technology in the development of professional activity.
G05	Capacity for teamwork, to lead, direct, plan and supervise multidisciplinary and multicultural teams in both national and international environments.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Train the student to listen to and defend arguments orally or in writing

Train the student to work out problems in creative and innovative ways.

Additional outcomes

The student will obtain the ability to conduct a preliminary analysis of the data, identifying relevant information and preparing it for further analysis. The student will know identify the appropriate statistical technique, based on the data available and taking into account their nature, to achieve the objectives. The student will get the ability to properly apply each statistical technique through appropriate tools, mainly using the statistical programming environment R. The student will be able to draw the relevant conclusions and know how to analyze and transmit them appropriately for decision making in a business economic scope.

6. Units / Contents

Unit 1: Introduction to Multivariate Analysis
    Unit 1.1 Data and measurement scale
    Unit 1.2 Introduction to Data Mining and software R for statistical computing
    Unit 1.3 Descriptive and exploratory data analysis
    Unit 1.4 Detection of outliers
    Unit 1.5 Treatment of non-response

Unit 2: Clasification and comparison of groups
    Unit 2.1 Linear discriminant analysis
    Unit 2.2 Cluster Analysis
    Unit 2.3 Analysis of variance
Unit 3: Data reduction methods
    Unit 3.1 Principal component analysis
    Unit 3.2 Factor analysis
Unit 4: Models for qualitative data analysis
    Unit 4.1 Contingency tables and measures of association
    Unit 4.2 Correspondence factor analysis
    Unit 4.3 Multidimensional scaling

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E03 E06 E11 G04	1	25	N	-	
Class Attendance (practical) [ON-SITE]	Combination of methods	E03 E06 E11 G01 G03 G04 G05	0.5	12.5	N	-	
Study and Exam Preparation [OFF-SITE]	Self-study	E03 E06 E11 G01 G04	1.2	30	N	-	
Writing of reports or projects [OFF-SITE]	Group Work	E03 E06 E11 G01 G04 G05	0.86	21.5	Y	Y	
Other off-site activity [OFF-SITE]	Self-study	E11 G01 G03 G04	0.76	19	Y	N	
Other on-site activities [ON-SITE]	Combination of methods	E06 E11 G01 G03 G04 G05	0.1	2.5	N	-	
Final test [ON-SITE]	Assessment tests	E06 E11 G01 G03 G04	0.08	2	Y	Y	
		Total:	**4.5**	**112.5**			
	Total credits of in-class work: 1.68				**Total class time hours: 42**		
	Total credits of out of class work: 2.82				**Total hours of out of class work: 70.5**		

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
Assessment of active participation	5.00%	0.00%	The active attitude of the student will be assessed in the classroom.
Fieldwork assessment	40.00%	0.00%	At the begining of the course working groups will be created and they will develop a project along the course. These projects will be supervised by the teacher and may need to be exposed at the end of the course.
Assessment of problem solving and/or case studies	15.00%	30.00%	The teacher will provide the student some tasks which will have to be solved and delivered at the end of each theme.
Final test	40.00%	70.00%	The teacher will provide the student some tasks which will have to be solved and delivered at the end of each theme.
Total:	**100.00%**	**100.00%**	

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).

Evaluation criteria for the final exam:
    Continuous assessment:
      The final test may be replaced by increasing the weight of the part corresponding to the resolution of problems or cases
    Non-continuous evaluation:
      Evaluation criteria not defined
Specifications for the resit/retake exam:
The student can only recover the qualifications of group work and problem solving (handing it over again according to teacher recommendations) and final test (exam). Qualifications of the other sections will be retained but without possibility of recovery

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	**hours**
Other on-site activities [PRESENCIAL][Combination of methods]	2.5
Final test [PRESENCIAL][Assessment tests]	2
Unit 1 (de 4): Introduction to Multivariate Analysis	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	6.67
Class Attendance (practical) [PRESENCIAL][Combination of methods]	3.33
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5

Writing of reports or projects [AUTÓNOMA][Group Work]	5.75
Other off-site activity [AUTÓNOMA][Self-study]	4

Group 10:

Initial date: 16-09-2019	**End date:** 07-10-2019

Unit 2 (de 4): Clasification and comparison of groups

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5.83
Class Attendance (practical) [PRESENCIAL][Combination of methods]	2.91
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5
Writing of reports or projects [AUTÓNOMA][Group Work]	5
Other off-site activity [AUTÓNOMA][Self-study]	5

Group 10:

Initial date: 07-10-2019	**End date:** 29-10-2019

Unit 3 (de 4): Data reduction methods

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5.83
Class Attendance (practical) [PRESENCIAL][Combination of methods]	2.91
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5
Writing of reports or projects [AUTÓNOMA][Group Work]	5
Other off-site activity [AUTÓNOMA][Self-study]	5

Group 10:

Initial date: 04-11-2019	**End date:** 25-11-2019

Unit 4 (de 4): Models for qualitative data analysis

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	6.67
Class Attendance (practical) [PRESENCIAL][Combination of methods]	3.35
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5
Writing of reports or projects [AUTÓNOMA][Group Work]	5.75
Other off-site activity [AUTÓNOMA][Self-study]	5

Group 10:

Initial date: 26-11-2019	**End date:** 17-12-2019

Global activity

Activities	hours
Writing of reports or projects [AUTÓNOMA][Group Work]	21.5
Other off-site activity [AUTÓNOMA][Self-study]	19
Other on-site activities [PRESENCIAL][Combination of methods]	2.5
Class Attendance (theory) [PRESENCIAL][Lectures]	25
Class Attendance (practical) [PRESENCIAL][Combination of methods]	12.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	30
Final test [PRESENCIAL][Assessment tests]	2
Total horas:	112.5

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	City	ISBN	Year	Description
Giudici, P.; Figini, S.	Applied data mining for business and industry	Wiley	Chichester (UK)	978-0-470-05887-9	2009	
Arriaza, Fernández, López, Muñoz, ...	Estadística Básica con R y R-Commander	Universidad de Cádiz				
Escobar Espinar, Modesto	Análisis gráfico/exploratorio	La Muralla Hespérides		84-7635-387-1	1999	
Everitt, B.; Hothorn, T..	A handbook of statistical analyses using R	Chapman and Hall/CRC	Boca Raton ; London ; New York	978-1-4200-7933-3	2010	
Gil Flores, Javier	analisis factorial	La Muralla-Hespérides.				
Everitt, B.; Hothorn, T..	An introduction to applied multivariate analysis with R	Springer	New York	978-1-4419-9649-7	2011	
Gil Flores, Javier	Análisis discriminante	La Muralla ; Salamanca Hespérides		84-7133-704-5	2001	
Johnson, Dallas E.	Métodos multivariados aplicados al análisis de datos	International Thomson Editores		968-7529-90-3	2000	
Lévy, J.P. y Varela, J.	Análisis Multivariable para las Ciencias Sociales	Pearson/Prentice			2003	
Martínez Arias, María Rosario	El análisis multivariante en la investigación científica	La Muralla Hespérides		84-7635-386-3	1999	
Peña, Daniel	Análisis de datos multivariantes	McGraw-Hill, Interamericana de España		84-481-3610-1	2002	
Tattar, P. N.; Rumaiah, S. y Manjunath, B. G.	A Course in Statistics in R	Wiley		978-1-119-15272-9	2016	
	Análisis multivariante aplicado :					

| Uriel Jiménez, Ezequiel | aplicaciones al marketing, | Thomson | 84-9732-372-6 | 2005 |