

**TEACHING GUIDE  
SUPERIOR STATISTIC**

**GRADO EN ECONOMÍA (INGLÉS)**

**ACADEMIC YEAR 2023-24**

Date: 12-07-2023

<b>I.-Subject Identification</b>	
<b>Type</b>	OPTATIVA
<b>Teaching period</b>	4 course, 1Q semester
<b>Nº of credits</b>	6
<b>Language in wich the subject is taught</b>	English

<b>II.-Presentation</b>
<p>The course aims to provide a strong understanding of applied statistical procedures so that individuals can do solid statistical analysis in business and economic situations. It attempts to combine a theoretical understanding of the methods and their assumptions with examples, leading to useful insight into business and economic problems.</p>

<b>III.-Competences</b>
<b>Generic competences</b>
<p>CT01. Ability to analyse and synthesise            CT03. Oral and written communication in native language            CT05. Knowledge of information systems relating to the field of study            CT06. Ability to analyse and search for information from different sources            CT07. Ability to solve problems            CT08. Ability to make decisions            CT09. Ability to work in a team            CT15. Ability to learn independently            CT17. Creativity            CB02 . That students are able to apply their knowledge to their work or vocation in a professional manner and have the skills that are typically demonstrated through the preparation and defense of arguments and problem solving within their field of study.            CB03 . That students have the ability to gather and interpret relevant data (usually within their field of study) to express judgments that include a reflection on relevant topics related to social, scientific or ethical areas.            CB04 . That students are able to transmit information, ideas, problems and solutions to both specialized and non-specialized audience.            CB05 . That students have developed the learning skills needed to undertake further studies with a considerable degree of autonomy.</p>
<b>Specific competences</b>
<p>CE01. Ability to put knowledge of economics into practice            CE02. Information search and research skills            CE06. Ability to learn and apply the different qualitative techniques used in economics            CE14. Ability to convert an empirical problem into an area of research and reach conclusions            CE19. Forecasting with different economic variables</p>

**IV.-Contents**

**IV.A.-Syllabus**

Topic 1: Introduction: Statistical Learning  
 Topic 2: Multivariate Data: Previous Analysis  
 Topic 3: Dimension Reduction: Factor Analysis, Model Selection and Regularization  
 Topic 4. Dimension Reduction: joint analysis  
 Topic 5: Supervised Classification Techniques: Discriminant Analysis  
 Topic 6: Supervised Classification Techniques: Logistic Regression  
 Topic 7: Variance Analysis  
 Topic 8: Unsupervised Classification Techniques: Clustering Methods and Decision Trees  
 Topic 9: Unsupervised Classification Techniques: SEM

**IV.B.-Training activities**

Type	Title
Practical / resolution of exercises	Practical exercises

<b>V.-Student workload</b>		
Lecture classes		32
Practical classes/resolution of exercises, case studies, etc.		25
Practical sessions in technological laboratories, hospitals, etc.		0
Tests		3
Academic tutorials		18
Related activities: conferences, seminars, etc.		0
Preparation of lecture classes		57
Preparation of practices, exercises, cases studies work		30
Test preparation		15
Total student workload		180
<b>VI.-Methodology and academic programme</b>		
Type	Period	Content
Master classes	Week 1 to Week 2	Topic 1. Introduction: Statistical Learning.
Master classes	Week 2 to Week 3	Topic 2: Multivariate Data: Previous Analysis.
Master classes	Week 4 to Week 5	Topic 3: Dimension Reduction: Factor Analysis, Model selection and Regularization.
Master classes	Week 5 to Week 6	Topic 4. Dimension Reduction: joint analysis.
Master classes	Week 6 to Week 7	Topic 5: Supervised Classification Techniques: Discriminant Analysis.
Master classes	Week 7 to Week 9	Topic 6: Supervised Classification Techniques: Logistic Regression.
Master classes	Week 9 to Week 10	Topic 7: Variance Analysis.
Work placements	Week 13 to Week 15	Exercises
Master classes	Week 11 to Week 12	Topic 8: Unsupervised Classification Techniques: Clustering Methods and Decision Trees.
Master classes	Week 12 to Week 13	Topic 9: Unsupervised Classification Techniques: SEM.

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Master classes	Week 13 to Week 15	Exercises and presentations
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## VII.-Assessment methods

### VII.A.-Assessment weighting

#### **Continuous ordinary assessment:**

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Subject Head and the prior and explicit authorisation of the Degree Programme Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must take into account the stipulations of the verified report. In order for these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the subject grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the subject weighting cannot be added.

**Extraordinary assessment:** Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

#### **Description of the tests for assessment and their weights.**

The evaluation will take place on the date determined by the University and will be composed by two evaluation parts: 1) The exam (brief questions and practical part) represents 60% of the final grade, and 2) The project, represents 40% of the final grade.

1) The exam is to be conducted on the official date established by the University. The exam will consist of two parts: the first will be a theoretical-practical test of six brief and concise questions (6 points) and the second, a practical part (4 points). The sum of the grades obtained in both parts will represent the exam mark which will weigh 60% of the final grade for the course.

2) Group work (the project) that, in addition to being delivered in pdf format, must be presented publicly through a 5-minute presentation and its defence by all its members, will constitute 40% of the final grade for the course. The defence determines the final grade of the student in this part, and a grade of zero out of ten can be obtained. The project must compulsorily be divided into five parts: Introduction, Method, Results, Conclusions, and Bibliography. The topic chosen for the work of the subject will have to be previously approved by the professor of the subject. The rules that the work must necessarily meet will be communicated at the beginning of the course through the Virtual Classroom.

The final grade will be the weighted average (60% exam and 40% project) of the exam and work grades. The average will be calculated only if both parts have passed (score equal to or greater than five). Therefore, in no case will compensations be made between suspended and approved parts.

If the student does not reach five out of ten in the final grade for the course, they must sit the exam again in an extraordinary session, which will have the same structure as that of the ordinary session. In addition, the professor can substitute the project with a written examination consisting of three brief questions about the subject.

**Work (projects) done in previous courses, or calls, will not be accepted.**

### VII.B. Assessment of students with an academic exemption

Student who wish to opt for this assessment will have to get an academic exemption for the subject, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the subjects own characteristics allow for it.

Subject with the possibility of an exemption: Yes

#### **VII.C. Review of assessment tests**

In accordance with the exam appeal regulations of the Universidad Rey Juan Carlos.

#### **VII.D.-Students with a disability or special educational needs**

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the Universidad Rey Juan Carlos Council, in order to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyse the different alternatives together.

#### **VII.E.-Academic behaviour, academic integrity and honesty**

The Universidad Rey Juan Carlos is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at the URJC means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. In order to monitor this procedure, the University has Regulations on academic behaviour at the Universidad Rey Juan Carlos and uses different tools (anti-plagiarism, supervision?) which provides a collective assurance that these essential values are completely developed

VII.-Bibliography
<b>Referecense Generic</b>
<i>An introduction to statistical learning.</i> James, G., Witten, D., Hastie, T., & Tibshirani, R. New York: Springer.
Multivariate Data Analysis. A Global Perspective, 7th edition, Joseph F. Hair William C. Black Barry J Babin and Rolph E. Anderson, Paraninfo
<b>Reference literature</b>
The Elements of Statistical Learning. Hastie, T., Tibshirani, R. y Friedman, J. Springer

IX.-Lecturers/Teachers/Professors	
<b>Lecturer/teacher/professor's name</b>	MIGUEL ALVAREZ GARCIA
<b>E-mail address</b>	miguel.alvarez@urjc.es
<b>Department/field</b>	Economía Aplicada I e Historia e Instituciones Económicas
<b>Category</b>	Profesor/a Asociado/a
<b>Subject Coordinator</b>	No
<b>Academic tutorial timetable</b>	Para consultar las tutorias póngase en contacto con el/la profesor/-a a través de correo electrónico
<b>Nº of Quinquenios</b>	0
<b>Nº of Sexenio</b>	0
<b>Nº period for technology transfer</b>	0
<b>Stretch Docentia</b>	0