BASIC DETAILS:

Subject:	ESTADÍSTICA		
Id.:	32258		
Programme:	GRADUADO EN ADMINISTRACIÓN Y DIRECCIÓN DE EMPRESAS (CA)		
Module:	MÉTODOS CUANTITATIVOS PARA LA EMPRESA		
Subject type:	MATERIA BASICA		
Year:	2	**Teaching period:**	Primer Cuatrimestre
Credits:	6	**Total hours:**	150
Classroom activities:	57	**Individual study:**	93
Main teaching language:	Inglés	**Secondary teaching language:**	Castellano
Lecturer:	OZCELIK, NADIN (T)	**Email:**	nozcelik@usj.es

PRESENTATION:

The statistics course, applied to the field of economics and business administration, aims to provide adequate techniques to promote the correct interpretation of economic data.

This course aims to develop the necessary skills and competences by providing adequate statistical methods and techniques for the most accurate analysis of economic data, which is essential to any decision-making process in the business environment. This course teaches basic statistical methods and techniques which supports the critical analysis skills for other courses and modules.

PROFESSIONAL COMPETENCES ACQUIRED IN THE SUBJECT:

General programme competences	G01	Ability to analyse and summarise information from several sources.
	G02	Creative and efficient resolution of problems that arise in day-to-day, in order to ensure the highest levels of quality of professional work.
	G03	Ability to organise and plan the work in the context of continuous improvement.
	G04	Use of information and communication technologies.
	G10	Ability to apply the acquired knowledge, adapting it to the needs and special features of each situation and person.
	G12	Ability to incorporate scientific research and evidence-based practice as a professional culture, updating knowledge and skills continuously.
	G13	Ability to develop learning strategies throughout life to be able to acquire new knowledge, by developing their own academic and professional path.
	G14	Oral and written communication in native language and in English, according to the needs of their field of study and the demands of their academic and professional environment.
Specific programme competences	E11	Learn the techniques and methods of quantitative nature applicable to the diagnosis, analysis and business exploration (mathematics, statistics and econometrics) being able to use the most appropriate tool in each situation.
Learning outcomes	R01	Develop data analysis using statistical software
	R02	Assess and interpret statistical information transmitted in scientific papers
	R03	Write and present statistical data analysis.
	R04	Use basic statistical techniques for data analysis
	R05	Identify and describe the basic elements of descriptive and inferential statistics.

PRE-REQUISITES:

It is recommended to have successfully completed Business mathematics (32252) course.

SUBJECT PROGRAMME:

Observations:

There are three main subjects: Descriptive statistics, probability and inferential statistics.

Subject contents:

1 - Descriptive statistics
1.1 - Introduction to statistics
1.2 - Frequency tables, frequency distributions, and graphic presentation
1.3 - Measures of central tendency, measures of dispersion and grouped data
1.4 - Describing data: Displaying and exploring data
2 - Probability
2.1 - Probability concepts
2.2 - Discrete probability distributions
2.3 - Continuous probability distributions
3 - Inferential statistics
3.1 - Estimation and confidence intervals
3.2 - Hypothesis testing

Subject planning could be modified due unforeseen circumstances (group performance, availability of resources, changes to academic calendar etc.) and should not, therefore, be considered to be definitive.

Learning activities:

Week		Unit/Block/Theme	Classroom sessions	Hours	Individual study activities	Hours
1	08/09/2025	1.1.Introduction to statistics	Introductory week. Presenting teaching methods,evaluation criteria, assignment deadlines, use of the PDU.	4	Review theory and work on exercises	2
2	15/09/2025	1.2.Frequency tables, frequency distributions, and graphic presentation	Theoretical class and practical exercises. Intro to GRETL.	4	Review theory and work on exercises	4
3	22/09/2025	1.3.Measures of central tendency, measures of dispersion and grouped data	Theoretical class and practical exercises.	4	Review theory and work on exercises	4
4	29/09/2025	1.3.Measures of central tendency, measures of dispersion and grouped data	Theoretical class and practical exercises.	4	Review theory and work on exercises	4
5	06/10/2025	1.4.Describing data: Displaying and exploring data	Theoretical class and practical exercises. Group assignment by using GRETL.	4	Review theory and work on exercises	6
6	13/10/2025	1.Descriptive statistics 1.1.Introduction to statistics 1.2.Frequency tables, frequency distributions, and graphic presentation 1.3.Measures of central tendency, measures of dispersion and grouped data 1.4.Describing data: Displaying and exploring data	**Written exam I** on Descriptive statistics will be held on **15.10.2025**	2	Review theory and work on exercises	4
7	20/10/2025	2.1.Probability concepts	Theoretical class and practical exercises.	4	Review theory and work on exercises	4
8	27/10/2025	2.1.Probability concepts 2.2.Discrete probability distributions	Theoretical class and practical exercises.	4	Review theory and work on exercises Group assignment by using GRETL.	4
9	03/11/2025	2.2.Discrete probability distributions 2.3.Continuous probability distributions	Theoretical class and practical exercises.	2	Review theory and work on exercises	6
10	10/11/2025	2.3.Continuous probability distributions	Theoretical class and practical exercises. Review unit 2.	4	Review theory and work on exercises Group assignment by using GRETL.	6
11	17/11/2025	2.Probability	**Written test 2** Theoretical class and practical exercises.	4	Review theory and work on exercises Group assignment through GRETL.	6
12	24/11/2025	3.1.Estimation and confidence intervals	Theoretical class and practical exercises.	4	Review theory and work on exercises	4

13	01/12/2025	3.1.Estimation and confidence intervals	Theoretical class and practical exercises.	4	Review theory and work on exercises Group assignment by using GRETL.	6
14	08/12/2025	3.2.Hypothesis testing	Theoretical class and practical exercises.	2	Review theory and work on exercises Group assignment by using GRETL.	6
15	15/12/2025	3.2.Hypothesis testing	Theoretical class and practical exercises. Presenting the group assigment carried out by GRETL.	4	Review theory and work on exercises	4
16	22/12/2025		Christmas break	0	Review theory and practical exercises	6
17	29/12/2025		Christmas break	0	Review theory and practical exercises	6
18	05/01/2026	3.Inferential statistics	Christmas break	0	Review theory and work on exercises	4
19	12/01/2026	1.1.Introduction to statistics	Final exam.	2	Review theory and practical exercises	6
20	19/01/2026	1.Descriptive statistics 2.Probability 3.Inferential statistics	Students will take final exam.	1	Review theory and work on exercises	1
			TOTAL CLASSROOM HOURS:	57	**TOTAL INDIVIDUAL STUDY HOURS:**	93

Observations for students exempt from compulsory attendance due to special circumstances:

Those students who are unable to attend 80 % of classes during the semester due to *justified reasons, for example, working while studying*, will have to get in touch with the lecturer and degree program coordinator by September 26. Those students are also responsible to hand in the individual and group assignments, and written tests specified in the PDU. If they fail to get an overall score of 5.0 out of 10, then they need to take resit exam.

Each particular case will be analysed to design a learning strategy and related individualized activities that ensure the achievement of the identified course objectives. In these cases, the student will need to attend the tutorials, previously determined with the lecturer. If the student does not contact with the lecturer by September 26, they may lose their right to be evaluated in the first call since they exceed the allowed absences (20%).

Those students who have been exempt from compulsory attendance will be assessed with the same criteria as attending students. The evaluating criteria and deadlines are the same for these students as for attending students. will only be allowed to be exempt from class attendance when *absence has been justified and agreed.*

Los estudiantes que, por causas justificadas (por ejemplo, compatibilizar estudios y trabajo), no puedan asistir al 80 % de las clases durante el cuatrimestre, deberán ponerse en contacto con la profesora de la asignatura y el coordinador del grado antes del **26 de septiembre.** Estos estudiantes también serán responsables de entregar las tareas individuales y en grupo, así como de realizar las pruebas escritas especificadas en el PDU. En caso de no alcanzar una calificación global mínima de 5,0 sobre 10, deberán presentarse al examen de recuperación (convocatoria extraordinaria).

Cada caso particular será analizado con el fin de diseñar una estrategia de aprendizaje individualizada, con actividades adaptadas que garanticen la consecución de los objetivos de aprendizaje de la asignatura. En estos casos, el estudiante deberá asistir a las tutorías previamente acordadas con el profesor. Si el estudiante no contacta con el profesor antes del 26 de septiembre, podría perder el derecho a ser evaluado en la primera convocatoria, al superar el límite permitido de ausencias (20 %).

Los estudiantes que hayan sido liberado de la asistencia obligatoria serán evaluados con los mismos criterios que el resto de los estudiantes asistentes. Los criterios de evaluación y las fechas Esta exención solo será válida cuando la ausencia esté debidamente justificada y haya sido acordada con el profesor y la coordinación académica.

TEACHING AND LEARNING METHODOLOGIES AND ACTIVITIES:

Teaching and learning methodologies and activities applied:

Many class activities are carried out in pairs and groups through problem solving exercises with (or without) software, presentations, debates, project preparation, etc. Students should check the PDU every week. During

theoretical classes, where the lecturer explains concepts orally with technological support, students are also expected to participate with questions. After theoretical classes, the student must study individually with the exercises and tasks to apply. During these sessions, students can ask questions, clarify concepts and ask for additional bibliography.The main methodologies used in this course will be:

- **Theoretical classes:** Main concepts are presented. Besides, there might be slides with questions and/ or problems which are solved during the class discussions.

- **Practical exercises:** Those exercises aim to reinforce the knowledge. Active participation of students is encouraged.

- **Group assignment:** Students carry out group assignment using GRETL for statistical analysis. Late submissions of assignments won't be accepted.

- **Written tests:** To ensure understanding of key statistical concepts, written tests are conducted on each topic (descriptive statistics, probability, and inferential statistics).

- **Independent study:** Students are expected to complete all independent study tasks and devote time to reviewing concepts and exercises.

- **Tutorial hours:** Students are encouraged to attend tutorial sessions, since, tutorial sessions provide an opportunity to students to address their questions and ask for additional bibliography, etc. It is worth mentioning that students must contact with the lecturer via email and ask for an appointment beforehand. **IMPORTANT:** Tutorials are sessions intended to address specific questions or doubts, not to provide private lessons or to explain the entire topic from the beginning.

Integration of English language in the subject:

The main language of this course will be in English. There will be also some sessions will be carried out in Spanish. The material provided and the lectures will also be in English, and Spanish as well.

Internationalization is one of the main objectives of CESUGA. The teaching staff will be gradually introducing materials, texts, audio-visual media and other content through English in the subjects they teach. This course of action is included in the principles of the European Area of Higher Education (EAHE). The aim is for students to naturally and effectively use English in authentic situations while studying subjects included in their degree programs. Exposure to the English language forms an intrinsic part of each degree programme’s plan of studies.

All activities in this subject will be carried out in English. These activities can be seen in the provisional activity plan and are marked: basically, practical exercises, use of sources in English, etc.

Student work load:

Teaching mode	Teaching methods	Estimated hours
Classroom activities	Master classes	45
	Practical exercises	5
	Practical work, exercises, problem-solving etc.	4
	Debates	1
	Coursework presentations	2
Individual study	Tutorials	5
	Individual study	52
	Individual coursework preparation	10
	Group cousework preparation	10
	Project work	3
	Research work	6
	Compulsory reading	2
	Other individual study activities	5
	Total hours:	150

ASSESSMENT SCHEME:

Calculation of final mark:

Otros(Written exams, group and individual assignment):	100	%
TOTAL	100	%

Specific assessment criteria

+ **Final exam** covering all subjects (50%)

+ **Written exams I & II** covers each unit (15% and 20%)

- **Group assignment** through GRETL (10 %). Late submissions of assignments will not be accepted.

- **Individual assignment** (5%) will involve tasks and exercises carried out in class.

To pass this course, students must obtain an overall score of at least 5.0 across all evaluation components (Three written exams, group assignments and individual assignment). Also, the The material given by the lecturer will be an indication of what needs to be studied. The student will have to search for and work on various sources of information.

If the students fail to obtain 5.0 then they need to attend resit exams in July.

The resit exams or second call (convocatoria extraordinaria) will consist of a **single comprehensive exam** covering all topics included in the syllabus. This exam will account for **100% of the final grade**.

Spelling: Within the evaluation criteria, the University considers spelling a priority issue. Under the protection of the changes in the language standard in the Spanish language included in the Spelling of the Spanish Language (2010), published by the Real Academia Española, CESUGA has established some correction criteria related to this work that will be applied in all tests of the matter. The document that includes the set of criteria and its sanction is published in the University Teaching Platform (PDU) of the subject. The same applies if English is the main language. Refer to unacceptable grammar errors.

Plagiarism: Likewise, and in accordance with the University's Good Practices manual, the commission of plagiarism in any of the work carried out will be considered a very serious offense, since it violates the deontological code of any profession. All assignments/ tasks must be handed in through the PDU and will be checked through Turnitin to avoid plagiarism.

Electronic devices (e.g.smartphones, tablets, etc.) which can distract students or disrupt learning are not allowed in the classroom unless the lecturer specifically allows the use of certain devices (e.g. laptops).

Absences: Failure to attend class more than 20 % of the stipulated hours without authorization may lead to the loss of the evaluation on first call.

Regulation on Plagiarism and Unlawful Practices

Actions that constitute copying or plagiarism, whether in whole or in part, of an assessment instrument will result

in the student receiving a fail (zero) for that assessment. In the case of group assessment instruments, the same grading will apply, with an attempt to individualise the responsibility of each member where possible. If individualisation of responsibilities is not possible or the responsibility is clearly collective, all members will receive the same fail grade (zero).

In the case of external placements, the resulting grade (fail, zero) entails the obligation to repeat the placement.

The final assessment of the impact of the grade (fail, zero) on an assessment instrument in relation to the final grade for the subject is at the discretion of the subject teacher.

For more information on what constitutes plagiarism and how to avoid it, you can consult: **https:/ / www.usj.es/ alumnos/ vidauniversitaria/ biblioteca/ investigacion/ como-publicar/ plagio**

Regulation on the Use of AI Systems

The use of any Artificial Intelligence in the learning activities such as carrying out the assignments, projects, tasks, essays, or research, including the exam, requires an authorisation and supervision from the lecturer(s). This authorisation will be indicated in the particular learning activity's instructions and must be strictly adhered to within the established scope and limits.

If the use of AI is allowed for the learning activity e.g. assignment, it will primarily be limited to the early stages of research, where it can serve as inspiration or suggest directions, but not to produce content that is directly included in submissions. If the reproduction of AI-generated texts is authorised, the student must clearly disclose this in the submitted document. This disclosure should explicitly indicate which AI methods and tools are embraced. In any case, the student must provide a detailed explanation of how AI was employed in the research process of the learning activity or assignment, including the prompts used, the checks performed to ensure the authenticity of the information proposed by the AI, and any modifications made to the AI-generated content.

The use of AI in learning activities and/ or academic work must respect the ethical principles of academic integrity and intellectual honesty. If a student misuses AI including the violation of the established regulations, the result will be a fail grade (zero) for the corresponding learning activity.

The final assessment of the impact of the fail grade (zero) on an assessment instrument in relation to the final grade for the subject is at the discretion of the subject teacher.

Assessment methods:

Assessment method	Learning outcomes assessed	Assessment criteria	%
Written tests	R02 R03 R04 R05	Tests on the three main topics: descriptive statistics, probability and inferential statistics.	60
Group Assignment	R01 R03 R04	Conducting a statistical analysis using GRETL software.	20
Individual assignment	R01 R02 R03 R04 R05	Handing out the classroom exercises actively as well as, out of classroom activities.	20
		Total weighting:	100

Observations for students exempt from compulsory attendance due to special circumstances:

Those students who are unable to attend 80 % of classes during the semester due to *justified reasons, for example, working while studying,* will have to get in touch with the lecturer and degree program coordinator by September 26. Those students are also responsible to hand in the individual and group assignments, and written tests specified in the PDU. If they fail to get an overall score of 5.0 out of 10, then they need to take resit exam.

Each particular case will be analysed to design a learning strategy and related individualized activities that ensure the achievement of the identified course objectives. In these cases, the student will need to attend the tutorials, previously determined with the lecturer. If the student does not contact with the lecturer by September 26, they may lose their right to be evaluated in the first call since they exceed the allowed absences (20%).

Those students who have been exempt from compulsory attendance will be assessed with the same criteria as attending students. Students will only be allowed to be exempt from class attendance when *absence has been*

justified and agreed.

Los estudiantes que, por causas justificadas (por ejemplo, compatibilizar estudios y trabajo), no puedan asistir al 80 % de las clases durante el cuatrimestre, deberán ponerse en contacto con la profesora de la asignatura y el coordinador del grado antes del **26 de septiembre.** Estos estudiantes también serán responsables de entregar las tareas individuales y en grupo, así como de realizar las pruebas escritas especificadas en el PDU. En caso de no alcanzar una calificación global mínima de 5,0 sobre 10, deberán presentarse al examen de recuperación (convocatoria extraordinaria).

Cada caso particular será analizado con el fin de diseñar una estrategia de aprendizaje individualizada, con actividades adaptadas que garanticen la consecución de los objetivos de aprendizaje de la asignatura. En estos casos, el estudiante deberá asistir a las tutorías previamente acordadas con el profesor. Si el estudiante no contacta con el profesor antes del 26 de septiembre, podría perder el derecho a ser evaluado en la primera convocatoria, al superar el límite permitido de ausencias (20 %).

Los estudiantes que hayan sido liberado de la asistencia obligatoria serán evaluados con los mismos criterios que el resto de los estudiantes asistentes. Esta exención solo será válida cuando la ausencia esté debidamente justificada y haya sido acordada con el profesor y la coordinación académica.

Extract from the internal regulations of the permanence regime

A student who does not appear for the final test provided in the Teaching Guide when it has a weight equal to or greater than 40% will be considered a "Not Presented" and will not use up the sitting. If the final exam percentage is lower or there is no final exam, the student will be considered "Not Presented" if he or she has taken assessment elements that represent less than 40% of the final grade.

A student will be considered ”Presented” to a test or assessment item if he or she takes it and, once the questions or instructions have been submitted and/or viewed and/or read, decides to withdraw.

In the event of a failure, the Teaching Guide may specify whether the results of the tests or assessment elements taken will be carried over to the next sitting within the same academic year. In any case, the results of tests or assessment elements from a sitting, if considered a "Not Presented," cannot be used for the next sitting within the same academic year. In general, the results of the evaluation tests of a course cannot be saved for the next courses.

Regulation for plagiarism and illegal practices

Any total or partial copying or plagiarism in an evaluation will result in a fail (zero) in said evaluation. In the case of group evaluations, they will be scored in the same way, trying to individualise the responsibility of each member, if possible. If this is not possible or the responsibility is clearly of all members, all of them will be awarded a fail (zero). In the case of external work placements, the resulting grade (fail, zero) obliges the student to repeat said work placements. The scope of the grade of the final assessment (fail, zero) in an evaluation with respect to the final subject grade is at the discretion of the subject teacher. To find out more about what plagiarism is and how to avoid it, you can consult: **https://www.usj.es/alumnos/vidauniversitaria/biblioteca/investigacion/como-publicar/plagio**

Regulation for the use of AI systems

The use of any form of Artificial Intelligence (AI) in carrying out learning activities such as assignments and exams, including projects, assignments, essays or research, requires due authorisation and supervision of the corresponding teaching staff. This authorisation will appear in the specific statement of the assessed learning activity and the scope, and limits established therein must be strictly respected.

Where the use of AI is authorised for the development of a learning activity, it will be limited primarily to the

early stages of the research, where it can provide inspiration or suggest direction, but not to produce content that is included directly in the final submission. If authorisation is given to reproduce texts generated by AI, the student must clearly disclose this fact in the submitted document. The AI methods and tools used must be expressly specified. In any case, the student must provide a detailed explanation about how the AI has been used in the research or process of the activity and/or work, including any prompts used, the verifications carried out to guarantee the authenticity of the information proposed by the AI and the modifications made to the content generated by the AI. The use of AI in learning activities and/or academic work must respect the ethical principles of academic integrity and intellectual honesty. If the student makes inappropriate use of AI in violation of the established regulations, the result of the grade in the corresponding learning activity will be a fail (zero).

The scope of the grade of the final assessment (fail, zero) in an evaluation with respect to the final subject grade is at the discretion of the subject teacher.

BIBLIOGRAPHY AND DOCUMENTATION:

Basic bibliography:

GRETL User's guide: https:/ / gretl.sourceforge.net/ gretl-help/ gretl-guide.pdf
MOORE, David S. The Basic Practice of Statistics. 5th Edition. W.H. Freeman and Company. 2010
PEÑA, Daniel. Fundamentos de estadística. Editorial: Alianza, 2008
Software for statistical analysis GRETL: https:/ / gretl.sourceforge.net/

Recommended bibliography:

CAMPBELL, Michael. Statistics at square one. Editorial: Wiley, 2009
DEVORE, Jay. Probabilidad y estadística para ingeniería y ciencias. Editorial: Paraninfo, 2009.
ESTEBAN, Jesús. Inferencia estadística. Editorial: Garceta, 2010
EVANS, Michael. Probabilidad y estadística. Editorial: Reverté, 2005
FERNANDEZ, Mª José. 225 problemas de estadística aplicada a las ciencias sociales. Ejercicios prácticospara alumnos. Editorial: Síntesis, 1996
FREEDMAN, David. Estadística. Editorial: Antoni Bosch, 1993
HAIR, J., et al. Multivariate Data Analysis. Pearson. 2007
LIND, D., et al. Statistical Techniques in Business and Economics. Pearson. 2018
LIPSCHUTZ, Seymour. Introducción a la probabilidad y estadística. Editorial: Mc Graw Hill, 2000
MONTERO, José María. Estadística descriptiva. Editorial: Paraninfo, 2007
PEREZ, César. Econometría básica : aplicaciones con EVIEWS, STATA, SAS y SPSS. Editorial: Ibergaceta,2012
PEREZ, César. Estadística aplicada a través del Excel. Editorial: Pearson, 2011
ROSS, Sheldon. Introducción a la estadística. Editorial: Reverté, 2007
SOLANAS, Antonio. Estadística descriptiva en ciencias del comportamiento. Editorial: Thomson, 2005
SPIEGEL, Murray. Probabilidad y estadística. McGraw Hill, 2010.
URIEL, Ezequiel. Introducción al análisis de series temporales. Editorial: AC, 2005

Recommended websites:

Eurostat (statistical office of the European Union)	epp.eurostat.ec.europa.eu
Instituto Aragonés de Estadística	www.aragon.es/DepartamentosOrganismosPublicos/Organismos/InstitutoAragonesEstadistica
Instituto Galego de Estatística	www.ige.eu
Instituto Nacional de Estadística	www.ine.es
International Monetary Fund	www.imf.org/external/index.htm
Ministerio de Industria Comercio y Turismo	www.minetur.gob.es/
Organization for Economic Cooperation and Development (OECD)	https://www.oecd.org/en/data.html
UCLA	https://stats.oarc.ucla.edu/other/dae/

World Trade Organisation	www.wto.org/indexsp.htm

OBSERVATIONS: