Syllabus
2025 - 2026

TECHNICAL SHEET OF THE SUBJECT

Data of the subject	
Subject name	Business Statistics
Subject code	E000005832
Mainprogram	Bachelor's Degree in Business Administration and Management
Involved programs	Grado en Administración y Dirección de Empresas y Grado en Derecho (E-3 16) [Third year]
Level	Reglada Grado Europeo
Quarter	Semestral
Credits	6,0 ECTS
Type	Obligatoria (Grado)
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SPECIFIC DATA OF THE SUBJECT

Contextualization of the subject

Contribution to the professional profile of the degree

Subject of instrumental character that allows to know the elements that take part in the business decision making in uncertainty environment, providing tools for:

- Summarize the statistical information and obtain measures of it Measure the uncertainty of random phenomena
- Analyze the behavior of random variables
- Produce generalizations from sample information

It is, on the other hand, a basic tool for its use in other matters: Quantitative Models for the Economy and Business, Fundamentals of Finance, Corporate Finance, Market Research, etc. ..., in which knowledge of reality and Decision-making on issues addressed in them are based on the knowledge of situations and events characterized by uncertainty.

Prerequisites

Knowledge of mathematical analysis of one and several variables.

Competencies - Objectives

Competences

GENERALES

CG01	Capacidad de análisis y síntesis	
	RA1	Analiza la información identificando sus elementos más significativos
	RA2	Realiza la abstracción y simplificación necesaria para modelizar estadísticamente el problema real planteado
	RA3	Integra el análisis gráfico, verbal y los datos cuantitativos y cualitativos para definir el modelo estadístico apropiado al problema
CG08	Conocimientos de informática relativos al ámbito de estudio	
	RA1	Conoce y emplea de forma suficiente herramientas informáticas de uso común para el análisis estadístico

ESPECÍFICAS

CE10	Capacidad para tratar, sintetizar y analizar la información. Conociendo los fenómenos aleatorios y los procesos de inferencia estadística	
	RA1	Conoce, diferencia y emplea los conceptos estadísticos para el análisis de la información- Identificación de variables, codificación y presentación sistemática de los datos
	RA2	Deduce información estadística relevante de un conjunto de datos
	RA3	Analiza e interpreta correctamente las relaciones entre distintas variables
	RA4	Comprende y aplica correctamente los conceptos fundamentales de la teoría de la probabilidad
	RA5	Comprende el concepto de variable aleatoria, discreta o continua, y elabora correctamente su distribución de probabilidad.
	RA6	Conoce la distribución de probabilidad conjunta de dos variables, analizando correctamente las relaciones de asociación y/o dependencia entre ellas
	RA7	Conoce distintos tipos de muestreo. Determina correctamente probabilidades en el caso de Muestro Aleatorio Simple
	RA8	Reconoce y diferencia la aplicación de distintos métodos de estimación y contrastación, adecuados al tipo de información disponible y a los objetivos pretendidos.
	RA9	Aplica correctamente los métodos de inferencia a situaciones reales sencillas, tomando decisiones oportunas e interpretándolas correctamente

THEMATIC BLOCKS AND CONTENTS

Contents - Thematic Blocks

PART 1: DATA DESCRIPTION

Topic 1: Statistics and data analysis in the era of big data

1.1. Big Data

1.2. Application examples

Topic 2: Descriptive statistics

2.1. Basic concepts

2.1. Classifications of variables and data.

2.2. Frequencies.Frequency tables

2.4. Graphs

2.5. Numerical summary of the data: measures of central tendency and position, measures of dispersion, measures of form, measures of concentration.

2.6. Analysis of the dependence between two variables

2.7. Weighted mean and geometric mean

PART 2: PROBABILITY THEORY

Topic 3: Uncertainty and its measure

3.1. Random phenomena and events

3.2. Concept of probability and its axioms

3.3. Conceptions of probability

3.4. Practical rules of the probability

3.5. Important details when working with events and probabilities

3.6. Conditional probability. Independient events

3.7. Rectification of the probability of an event. Bayes theorem

Topic 4: Random Variables

4.1. Basic concepts

4.2. Discrete random variable

4.3. Some models of discrete variable: Binomial and Poisson

4.4. Continuous random variable

4.5. Some models of continuous variable: Uniform and Normal

PART 3: STATISTICAL INFERENCE

Topic 5: Introduction to inference and simple random sampling

5.1. Basics of inference

5.2. Simplified random sampling

5.3. Distribution of sample

5.4. Distribution of statistics

Topic 6: Parameter estimation

6.1.Estimation

6.2 Methods for obtaining point estimators

6.3 Properties of point estimators

6.4. Confidence intervals

TEACHING METHODOLOGY

General methodological aspects of the subject

The methodology is varied, combining face-to-face and non-face-to-face, individual and group, conceptual and practical application activities using data and computer applications.

In-class Methodology: Activities

Keynote presentation of the general framework of each topic deepening the key concepts Realization and discussion of examples of practical application to deepen the concepts Basic introduction to the use of computer applications for statistical data processing Performing small online elementary level tests to review the concepts developed in each master class. Immediately after, they will be corrected in class to provide students with information about their learning Performing exercises and / or case studies in class Resolution of doubts of online practices, in order to provide information about their learning	CG01, CG08, CE10

Two or three intermediate tests of the basic blocks of the subject Completion of the final exam of the subject	
Non-Presential Methodology: Activities	
Study and deepening of concepts Practical application of computer tools presented in class Consultation of specific questions in individual or group tutoring Online practice They will be more complex tests than online class tests. Some of them will require the application of computer applications for statistical data processing Performing exercises and / or case studies outside of class Final exam preparation	CG01, CG08, CE10

SUMMARY STUDENT WORKING HOURS

CLASSROOM HOURS		
Lecciones de carácter expositivo	Ejercicios y resolución de casos y de problemas	
40.00	50.00	
NON-PRESENTIAL HOURS		
Ejercicios y resolución de casos y de problemas	Estudio individual y/o en grupo y lectura organizada	Trabajos monográficos y de investigación, individuales o colectivos
30.00	30.00	30.00
ECTS CREDITS: 6,0 (180,00 hours)		

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.

Evaluation activities	Evaluation criteria	Weight
	Numeric grading: 0–10. **Approximate duration:** 120 minutes. Priority will be given to the understanding of concepts and their application in practical cases, rather than to mere numerical calculation. 80% of the exam grade will correspond to multiple-choice questions (**WITHOUT PENALIZATION** for	

FINAL EXAM: A final exam of the subject will be carried out (common to the corresponding groups), whose content is the entire program.	incorrect answers), and the remaining 20% to open questions. **Requirements:** 1. To pass the course, it is mandatory that the grade on the final exam be **4.5 out of 10 or higher**, although the overall course average must be **5 out of 10 or higher** in order to pass. 2. Open questions will only be graded if the multiple-choice section grade is **3.5 out of 10 or higher**. 3. For the multiple-choice and open-ended questions to be averaged together, the grade on the open questions section must be **3.5 out of 10 or higher**. If requirements 2 or 3, or both, are not met, the final exam grade will be the lower of the two parts (multiple-choice section and open questions section).	60 %
CONTINUOUS EVALUATION TESTS: From topics 2, 3, and 5: Three in-person multiple-choice tests will be administered (**WITHOUT PENALIZATION** for incorrect answers) on these topics.	**Numeric grading: 0–10.** **The tests will be taken on paper using optical mark sheets.** **Each test will last approximately 20–25 minutes.** Priority will be given to the understanding of concepts and their application in practical cases, rather than to mere numerical calculation. They will cover topics 2, 3, and 5, and each will account for **5% of the final grade**. There is the possibility of an additional voluntary multiple-choice test on topic 6, at the discretion of each group's instructor. This test would only serve to improve the average grade of this block. Tests not taken will receive a grade of **0**, unless the absence is justified by the group tutor. In that case, the test will be annulled and its percentage will be added to that of the final exam.	15 %
IN PERSON OPEN QUESTIONS TEST on topic 4	**Numeric grading: 0–10** On paper, lasting about 40 minutes. A test not taken will receive a grade of **0**, unless the absence is justified by the group tutor. In that case, the test will be annulled and its percentage will be added to that of the final exam.	15 %

GROUP PROJECT ON TOPIC 3	**Numeric grading: 0–10** It will be carried out outside the classroom with the help of generative AI. Each group must propose a problem from this topic, along with its solution. The possibility of requesting an oral defense of the work from all or some of the students will be considered.	5 %
GROUP PROJECT ON TOPIC 6	**Numeric grading: 0–10** It will be carried out in the classroom with the help of Excel. The possibility of requesting an oral defense of the work from all or some of the students will be considered. It may be conducted during the second-to-last or last week of class of the course in the semester.	5 %

Ratings

T**he use of AI to create complete assignments or significant parts of them, without citing the source or tool, or without it being expressly permitted in the assignment description, will be considered plagiarism and regulated in accordance with the University's General Regulations**. In any case, the teaching team of the course encourages the use of this tool in the students' preparation, considering it very useful for raising questions and preparing practical exercises—although always under the student's responsibility, since the answers it provides may not be completely accurate.

Wearing a Smartwatch during continuous assessment tests or the final exam is not allowed.
Only simple calculators (with the essential mathematical operations only) are allowed in any assessment test. In case of doubt about whether a calculator is suitable, the student may show it to the instructor a few days BEFORE the assessment test for approval.

STUDENTS IN ORDINARY CALL (first call) and **EXTRAORDINARY** (second call): the same grading system will be applied: all components of continuous assessment completed during the course are weighted.

- It is an **essential requirement to pass the subject** in any of the calls that the exam grade be at least **4.5 points (on a 0–10 scale)**. In addition, the grade in each of the 2 parts of the exam (multiple-choice questions and open-ended questions) must be at least **3.5 points**. In any case, the overall course average, considering all evaluation items, must be greater than 5.

In the first and second call, if the final exam grade is lower than 4.5, the student's final grade will be the lower of these two:
a) the exam grade;
b) the average grade including all evaluation items.

It will be possible to obtain up to **0.5 extra points** for participation in various voluntary activities proposed by the instructor.

At the discretion of each instructor, there may be an additional test to determine the students who are awarded the Honors.

EXCHANGE STUDENTS (OUT) AND REST OF CALLS (3rd and following)**:** the final grade will be based 100% on the exam, unless the student agrees with the instructor to take the in-class tests. In that case, the grade will be the best of these two options:

100% exam

70% exam – 30% in-class tests

Students with SCHOOL WAIVERS and exceptional situations: these will be handled on a case-by-case basis, seeking a balance between fairness and learning objectives.

WORK PLAN AND SCHEDULE

Activities	Date of realization	Delivery date
In-person multiple-choice test on topic 2	At the end of topic 2.	It will be scheduled by the group instructor.
In-person multiple-choice test on topic 3	At the end of topic 3	It will be scheduled by the group instructor.
Group project on topic 3 using generative AI (outside the classroom)	At the end of topic 3.	It will be scheduled by the group instructor.
In-person open questions test on topic 4	At the end of topic 4.	It will be scheduled by the group instructor.
In-person multiple-choice test on topic 5	At the end of topic 2	It will be scheduled by the group instructor
Group project on topic 6 using Excel (in the classroom)	At the end of topic 6	It will be scheduled by the group instructor.

BIBLIOGRAPHY AND RESOURCES

Basic Bibliography

- *Estadística Empresarial en 101 ejemplos (volumen I).* **Borrás Palá, F.; Martínez de Ibarrtea Zorita, C; Escobar Torres, L.S.,** Edit EV Services
- *Estadística Empresarial en 101 ejemplos (volumen II).* **Borrás Palá, F.; Martínez de Ibarrtea Zorita, C; Escobar Torres, L.S.,** Edit EV Services
- *Estadística para administración y Economía.8ª edición (castellano)* **.Newbold,P; Carlson,W.L.;Thorne, B..** Edit.Pearson Prentice Hall
- *Statistics for Business and Economics.8ª Edition (English)***. Newbold,P; Carlson,W.L.;Thorne, B..** Edit.Pearson Prentice Hall
- *Estadística: Problemas resueltos***. Peralta, M.J; Rua Vieites, A.; Redondo Palomo, R.; del Campo Campos, C.** Editorial Pirámide (2007**)**

Complementary Bibliography

- *Introducción a la estadística económica y empresarial (teoría y práctica)***. Martín Pliego, J.** Editorial Thomson.(2004)
- *Fundamentos de Probabilidad*. 2ª edición **Martín Pliego, J., Ruiz Maya, L**. Editorial Thomson. (2006)
- *Fundamentos de Inferencia Estadística*. 3ª edición **Martín Pliego, J., Ruiz Maya, L**. Editorial Thomson (2004).
- *Inferencia Estadística*. **Casas Sánchez, J.M**. Editorial Centro de Estudios Ramón Areces (1997)
- *Ejercicios de inferencia estadística y muestreo para economía y administración de empresas*. **Casas Sánchez, J.M; García Pérez, C; Rivera Galicia, L; Zamora Sanz, A** (2006). Edit. Pirámide
- *Probabilidad y Estadística*. **DeGroot, M.H.** Addison Wesley Iberoamericana (1988)