COURSE PROGRAM

Academic Year: 2025/2026

Identification and characteristics of the course			
Code	500007	ECTS Credits	6
Course name (English)	INTRODUCTION TO STATISTICS		
Course name (Spanish)	INTRODUCCIÓN A LA ESTADÍSTICA		
Degree programs	• Bachelor's Degree in Economics. • Bachelor's Degree in Business Administration. • Double Bachelor's Degree in Business Administration and Law. • Double Bachelor's Degree in Business Administration and Economics. Double Bachelor's Degree in Business Administration and Labor Relations and Human Resources.		
Faculty/School	Faculty of Economics and Business Administration		
Semester	2º	Type of course	Compulsory
Module	Basic training		
Matter	Statistics		
Lecturer/s			
Name	Office	E-mail	Web page
JOSÉ MANUEL AUSÍN GÓMEZ (FCCEE)	30	jmausin@unex.es	
Subject Area	Financial Economy and Accounting		
Department	Financial Economy and Accounting		
Coordinating Lecturer (If more than one)	MARCELINO SÁNCHEZ RIVERO (FCCEE)		

Competencies /Learning Outcomes*
CB1 – To demonstrate and understand a basic level of the field knowledge, showing a progress of knowledge from a basic secondary school level to an advanced level, through the study of the most recent research in the field.
CB2 – To apply their knowledge to their work in a professional manner. Students should possess the skills that are usually demonstrated through presenting arguments and solving problems within their area of study.
CB3 – To collect and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific, or ethical issues.
CB4 – To provide information, ideas, problems and solutions to both specialized and non-specialized audiences.
CB5 – To develop the necessary learning skills to undertake further studies with a high degree of autonomy.
CG2 – To provide rationality to the analysis and description of any aspect of business reality.
CG3 – To apply professional criteria based on the management of technical instruments to the analysis of business problems.
CT1 – To manage, analyze, and synthesize.
CT3 – Oral and written communication skills in the native language.
CT5 – ICT literacy related to the field of study.

* The sections concerning competencies, course outline, educational activities, teaching methodologies, learning outcomes and assessment systems must conform to that included in the ANECA verified document of the degree program.

CT7 – To solve problems.
CT14 – To use critical thinking
CT17 – Independent learning ability.
CE9 –To identify and know how to use basic methodologies and precise quantitative instruments for business analysis, diagnostics, and planning, as well as for the study of business information, along with its economic and social environments.

Contents

Course outline*

Introduction to Statistics. One-dimensional frequency distributions. Main descriptive statistics of frequency distributions. Two-dimensional frequency distributions. Index numbers. Introduction to Probability. Random variables. Discrete probability distributions. Continuous probability distributions.

Course syllabus

Name of lesson 1: Introduction to Descriptive Statistics. One-Dimensional frequency distributions.

Contents of lesson 1:

1.1. Definition of Statistics.
1.2. Steps of the scientific method in Statistics.
1.3. Branches of Statistics.
1.4. The importance of Statistics in economics.
1.5. Basic concepts of Statistics.
1.6. One-dimensional frequency distributions.
1.6.1. Graphical displays.
1.6.1. Measures of location.
1.6.2. Measures of variability.
1.6.3. Measures of shape.
1.6.4. Measures of concentration.

Description of the practical activities of lesson 1:

1.1. Introduction to statistical software.
1.2. Construction of graphical presentations and discrete and continuous frequency distributions using statistical software.
1.3. Analysis of the frequency distributions.
1.4. Calculation of basic descriptive statistics using statistical software.
1.5. Analysis of the meaning and the representativeness of the measures.

Name of lesson 2: Two-dimensional frequency distributions and index numbers.

Contents of lesson 2:

2.1. Two-dimensional frequency distributions.
2.1.1. Crosstabulation.
2.1.2. Marginal and conditional distributions.
2.1.3. Covariance and correlation coefficient.
2.1.4. Statistical independence.
2.2. Index numbers.
2.3. Deflation of economic series.

Description of the practical activities of lesson 2:

2.1. Construction a crosstabulation using statistical software.
2.2. Calculation of measures of association using statistical software.
2.3. Analysis of the meaning of the measures in relation to the dependency or the independence between variables.
2.4. Calculation of index numbers using statistical software.

Name of lesson 3: Introduction to probability.

Contents of lesson 3:

3.1. Introduction to the basic concepts of probability.

3.2. Definition and calculation of probability.
3.3. Conditional probability.
3.4. Bayes' Theorem.
3.5. Event Independence.

Description of the practical activities of lesson 3:
3.1. Probability calculation exercises.

Name of lesson 4: Random variables and probability distributions.

Contents of lesson 4:
4.1. One-dimensional random variables.
4.1.1. Probability distribution.
4.1.2. Expected value and variance. Properties.
4.1.3. Standardizing a random variable.
4.2. Two-dimensional random variables.
4.2.1. Marginal and conditional distributions.
4.2.2. Joint expected value.
4.2.3. Covariance and correlation coefficient. Covariance properties.
4.2.4. Statistical independence.
4.3. Main discrete probability distributions: Bernoulli, binomial, Poisson and hypergeometric.
4.4. Main continuous probability distributions: normal, Pearson's *chi-squared*, Student's *t* and Snedecor's *F* distribution.
4.5. Central Limit Theorem.

Description of the practical activities of lesson 4:
4.1. Calculation exercises with one-dimensional random variables.
4.2. Calculation exercises with two-dimensional random variables.
4.3. Calculation of probabilities of discrete distribution using statistical software.
4.4. Calculation of probabilities of continuous distribution using statistical software.

Educational activities *

Student workload in hours by lesson		Lectures	Practical activities				Monitoring activity	Homework
Lesson	**Total**	**L**	**HI**	**LAB**	**COM**	**SEM**	**SGT**	**PS**
1. Theory	17	7						10
1. Practice	9	3						6
2. Theory	23	9						14
2. Practice	18	8						10
3. Theory	10	4						6
3. Practice	10	4						6
4. Theory	27	11						16
4. Practice	26	11						15
Assessment **	10	3						7
TOTAL	**150**	**60**						**90**

L: Lectures (85 students)
HI: Hospital internships (7 students)
LAB: Laboratory or field practices (15 students)
COM: Computer room or language laboratory practices (20 students)
SEM: Problem classes or seminars or case studies (40 students)
SGT: Scheduled group tutorials (educational monitoring, ECTS type tutorials)
PS: Personal study, individual or group work and reading of bibliography.

** Indicate the total number of evaluation hours of this subject.

Teaching Methodologies*

1. Expository method consisting of the presentation by the instructor of the course content related to the subject under study. It also includes the resolution of example problems by the instructor.

2. Problem-based method, in which the instructor presents problems to be solved during class sessions. Students work collaboratively to develop and interpret appropriate solutions through the application of problem-solving procedures.

3. Case studies, projects, and experiments. This involves an intensive and comprehensive analysis of a real case, project, simulation, or experiment with the aim of understanding, interpreting, resolving it, generating hypotheses, verifying data, reflecting, consolidating knowledge, diagnosing it, and, at times, training in alternative solution procedures.

4. Collaborative activities based on digital resources and tools, especially those provided by the Virtual Campus of the University of Extremadura (UEx).

5. Learning/assessment situation in which the student undertakes a test that serves both to reinforce their learning and as an assessment tool.

Learning outcomes *

Based on the knowledge and understanding of the fundamental principles and concepts of Statistics as a tool for measuring economic and social phenomena, the student will be able to interpret and critically evaluate the results obtained from the analysis of information, as well as develop skills in the use of computer tools and new information and communication technologies applied to the statistical field.

Assessment systems *

According to the regulations on the assessment of learning outcomes and competencies acquired by students in official degree programs at the University of Extremadura (DOE No. 212, November 3, 2020), and in accordance with the Verified Report of the degree program, the following assessment systems are established:

Continuous assessment system, consisting of ongoing assessment tests carried out through partial exams during the course or a final exam. The average grade of the partial exams or the final exam will account for 100% of the final course grade. The final exam will be held on the official date established by the Faculty, and the passing requirements will be the same as those defined for the global assessment system.
The final grade for students choosing this system will be determined by the unweighted average of the partial exams taken throughout the course—provided all partial exams are passed with a minimum grade of 4 out of 10—or by the grade obtained in the final exam if all partial exams are not passed. All partial exams will carry equal weight in the calculation of the final grade.

Assessment system based on a single comprehensive final exam. This system consists of a single final exam to be taken on the official date established by the Faculty. If the exam includes both theoretical and practical sections, a minimum grade of 4 out of 10 will be required in each section in order to calculate the final average.
The choice to follow this global assessment system must be made by the student during the first quarter of the course instruction period, or by the last day of the extended registration period if this ends later than the first quarter.
Both the partial exams and the final exam will include theoretical and practical tests aimed at evaluating students' understanding of theoretical concepts and the application of statistical methods covered in the course. These assessments may be conducted in written form or using a computer, in which case the software tools developed throughout the course will be used.
For partial exams, instructors will inform students of the exam dates at least fifteen days in advance. Students who have not passed the course through partial exams—meaning they did not pass all partial exams with a minimum grade of 4 out of 10—will be required to take the final

exam covering 100% of the course content, regardless of the number of partial exams previously passed during the continuous assessment. Consequently, no partial exam grade will be carried over to the final exam, and students may not take a subsequent assessment test if they have not obtained at least a grade of 4 out of 10 in the previous one.
In both assessment systems, the course will be considered passed if the final average grade is equal to or greater than 5 out of 10.

The date, time, and location of the final exam will be determined by Faculty and will be published on official notice boards and on the institutional website.

All academic and teaching activities related to this course shall be carried out in accordance with the University of Extremadura's Code of Conduct (see "Code of Conduct and Disciplinary Regulations for Students at the University of Extremadura," DOE No. 1, January 2, 2024, at https://doe.juntaex.es/pdfs/doe/2024/10o/23064505.pdf).
In this context, student behavior in the classroom must always reflect the utmost respect toward both peers and the instructor. The use of electronic devices (mobile phones, laptops, tablets, etc.) is not permitted unless they are strictly necessary for class participation or access to computer lab resources, and only when expressly authorized by the instructor. Eating is not allowed during class sessions, and only water may be consumed.
Failure to comply with these rules—as well as comments, conversations, or any gestures or behaviors that disrupt the normal functioning of the class—may result in the student being expelled from the classroom. The professor will organize the seating arrangement and may assign students to specific places in the classroom at their discretion.

Bibliography (basic and complementary)

a) Basic Bibliography:

- CASAS SÁNCHEZ, J.M., GARCÍA PÉREZ, C., RIVERA GALICIA, L.F. y ZAMORA SANZ, A.I. (2006): Ejercicios de estadística descriptiva y probabilidad para economía y administración de empresas. Ediciones Pirámide. Madrid.
- MARTÍN-PLIEGO LÓPEZ. F.J. (2007): Introducción a la Estadística Económica y Empresarial. Ed. Thomson, 3ª edición. Madrid.
- RUÍZ MACÍAS, P.; AUSÍN GÓMEZ, J.M. "Estadística descriptiva, teórica e inferencial". Editorial Universitas, Badajoz, 2000.
- SÁNCHEZ RIVERO, M. (2021): Estadística aplicada a la Economía y a la Empresa: Volumen 1 (Teoría). García-Maroto Editores, S.L.
- SÁNCHEZ RIVERO, M., RICCI RISQUETE, A., CORRALES DIOS, N. (2022): Estadística aplicada a la Economía y a la Empresa: Volumen 2 (Ejercicios). García-Maroto Editores, S.L.

b) Supplementary Bibliography:

- ANDERSON, D.R., SWEENEY, D.J., WILLIAMS, T.A. (2001), 7ª Edición: *Estadística para la Administración y Economía.* Editorial International Thomson, México.
- ARNALDOS GARCÍA, F., DÍAZ DELFA, M.T., FAURA MARTINEZ, U., MOLERA PERIS, L. y PARRA FRUTOS, I. (2003): Estadística Descriptiva para Economía y Administración de Empresas. Editorial AC (Thomson), 1ª edición.
- LEVIN, R.I., RUBIN, D.S., BALDERAS, DEL VALLE, GOMEZ (2004), 7ª Edición: *Estadística para Administración y Economía.* Editorial Pearson-Prentice Hall, México.
- LLORENTE GALERA, F., MARÍN FERÍA, S. y TORRA PORRAS, S. (2003): Principios de estadística descriptiva aplicada a la empresa. Editorial Centro de Estudios Ramón Areces, S.A. Madrid.
- PERALTA ASTUDILLO, M.J., RÚA VIEYTES, A., REDONDO PALOMO, R. y DEL CAMPO CAMPOS, C. (2007): *Estadística: problemas resueltos.* Ediciones Pirámide. Madrid.

Other resources and complementary educational materials

- Virtual campus of the University of Extremadura.
- Web pages with statistical content.
- Statistical data repository at regional, national, or international level.