| **Faculty** | 151 - Faculty of Economics and Business. Álava Department | **Cycle** | Not Applicable |
| **Degree** | GADEMP10 - Bachelor's Degree in Business Management & Administration | **Year** | Second year |

COURSE

| 25832 - Statistics and Data Analysis | **Credits, ECTS:** | 6 |

COURSE DESCRIPTION

"Statistics and Data Analysis" is a compulsory subject of the first semester of the second course of Business Administration and Management. It belongs to the second module of the degree, called Fundamentals of Business.
The work developed in this subject allows students to analyze and draw conclusions in simple research studies, based on data available in any field related to the company and the economic and social reality. This course aims to be, therefore, an introduction to the basic statistical concepts and the most common descriptive statistical techniques used in economic and business sciences. The subject is oriented to provide the student with a general, rational and applied vision of statistics, emphasizing the most useful aspects for professional practice.
In addition to an introduction to descriptive statistics, the fundamentals of probability and random variables will also be worked on. These issues will serve as the basis for understanding the subject "Applied Statistics for Business" in the second semester and Econometrics in the third year. In addition, data analysis will serve as a transversal competence in subjects such as Economic Structure, Commercial Management or Macroeconomics.
It is advisable to master the subjects of mathematics of the first course (Mathematics I and II) for an adequate understanding of this subject, although an excessive mathematical formalism will be omitted for the sake of a more practical, intuitive and applied approach.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

The main objective of this subject is that the student learns and acquires the necessary skills to be able to use statistics both at the level of understanding as of analysis and communication, within the scope of economics and business.

SPECIFIC COMPETENCES OF THE SUBJECT
The specific competences that this subject aims to develop in students are:
C1-Understand the logic of statistics and its usefulness in economic science.
C2-Identify the mathematical elements that characterize probability distributions, both discrete and continuous (probability function) and understand their relevance for inferential analysis.
C3-Search and synthesize the relevant statistical information to analyze an economic or business problem.
C4-Describe and interpret the information contained in a data set using graphical analysis and the main descriptive statistics, as well as using the appropriate statistical software.
C5-Present in a clear and systematic way the conclusions obtained in the descriptive analysis of the economic data.

TRANSVERSAL COMPETENCES OF THE DEGREE

With respect to the transversal competences, special emphasis will be put on:
-Autonomous learning: develop learning skills to acquire a high degree of autonomy
-The capacity for analysis and synthesis: know how to search, identify, analyze and synthesize information from various sources.
-Oral and written communication
These competences will be developed and evaluated through the activities proposed in the continuous evaluation (see evaluation system).

LEARNING RESULTS:
As a result of learning the subject, the student will be able to:

-Identify and search the relevant statistical information for the analysis of an economic or business problem (C1, C3)
-Analyze, describe and interpret appropriately a set of statistical data, applying statistical methods and using graphical analysis (C1, C2, C4)
-Structure, prepare and present reports of descriptive statistics (C1, C3, C4, C5)

CONTENIDOS TEÓRICO-PRÁCTICOS

The main contents of this subject are:

1. INTRODUCTION: DESCRIPTION OF A SET OF DATA
1.1. Statistical science and its role in economic and business research
1.2.- Basic concepts and notation. Types of variables
1.3.- Distributions of frequencies: tables and graphical displays

2. DESCRIPTION OF A DISTRIBUTION
2.1.- Measures of central tendency
2.2.-Measures of variability
2.3.- Measures of shape
2.4.- Measurement of the concentration

3.- DESCRIPTION OF THE RELATIONSHIP BETWEEN TWO VARIABLES
3.1.- Contingency tables and graphic representation
3.2.- The correlation coefficient
3.3.-Independence between variables
3.4.-Correlation and causality

4.- INDEX NUMBERS
4.1.- Simple and complex index numbers
4.2.- Growth rates
4.3.- The Consumer Price Index and deflation

5.- PROBABILITY
5.1.-Spaces of probabilities and stochastic events
5.2.- Definition and calculation of the probability of a single event
5.3.- Independent events
5.4.-Conditional Probability and Bayes´ Theorem

6.- DISCRETE RANDOM VARIABLES
6.1.- Definition of random variable
6.2.- Expectation and variance function in discrete random variables
6.3.- Operations and transformations of random variables
6.4.-Binomial and Poisson distribution

7.- CONTINUOUS RANDOM VARIABLES. THE NORMAL DISTRIBUTION
7.1.- Concept of continuous random variables
7.2.- The density function
7.3.- The normal distribution
7.4.- The Central Limit Theorem

TEACHING METHODS

The teaching methodology developed in the subject will be coherent with the learning objectives and the skills to be developed in it. Thus, the following teaching methodology will be used:

- Teaching classes: During a part of each session , the teacher will present the concepts and techniques necessary to achieve the proposed objectives. The contents will be explained in the classroom through specific material available to students in the Egela platform, with additional help from the proposed bibliography and other resources.

-Planning and resolution of issues and problems, interpretation of data and statistical simulations. On a regular basis, in order to set the conceptual contents and to develop the competences proposed in the subject, students will take an active role in the resolution of practical cases in the classroom or outside, working cooperatively or individually and developing their critical capacity and autonomous learning. Some activities and tasks will be carried out in the classroom and others will be carried out autonomously by the student. The feedback of these activities will be given in the teaching sessions.

-Finally, outside of school hours the students must carry out an entire research and present a statistical report (set objectives and methodology, design a survey, collect data, tabulation, data analysis and drawing of conclusions) . This activity will be supervised by the teacher during the first half of the semester, on a continuous basis. The students must subsequently present the work done to the rest of the group in determined sessions.

In addition, the students can also go to the teacher´s office or virtual tutorials if they need personalized help related to the concepts, exercises or tasks developed in the classes.

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	51	3	3		3				
Horas de Actividad No Presencial del Alumno/a	76,5	4,5	4,5		4,5				

Legend:

M: Lecture-based
GL: Applied laboratory-based groups
TA: Workshop

S: Seminar
GO: Applied computer-based groups
TI: Industrial workshop

GA: Applied classroom-based groups
GCL: Applied clinical-based groups
GCA: Applied fieldwork groups

Evaluation methods

- Continuous evaluation
- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions   70%
- Research on data analysis   30%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The classes are designed to follow a continuous assessment, which will consist of the delivery and presentation of a statistical report of descriptive statistics. Additionally, the delivery of tasks, the completion of questionnaires and participation in the learning sessions can be also evaluated.

Through the activities developed both in the classroom and outside the classroom, and in the statistical report carried out by the students, the theoretical and practical knowledge acquired by the students will be assessed, as well as the competences of the subject.

Throughout the course, information on continuous evaluation (deadlines, rubrics, presentation dates, etc.) will be provided through the eGela virtual platform.

Although the development of teaching will be focused on continuous assessment, in accordance with the regulation Regulating the Student Assessment of Degree Degrees (BOPV nº50, March 13, 2017), the student has the possibility of renouncing the system of continuous evaluation and choose a final assessment, regardless of whether or not he has participated in the aforementioned activities and tasks (article 8.3).

If a student does not attend the final exam set on the official date, he automatically waives that call.

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

In the extraordinary call students can choose to keep the mark that they have obtained in the continuous assessment and therefore, examine only the content, competences, and skills not passed.

The other option the students can take in the extraordinary call is to sit the exam about the 100% of the subject.

If a student does not attend the final exam set on the official date, he automatically waives that call.

MANDATORY MATERIALS

The students can consult the basic manual and the complementary materials. In addition, a series of exercises, videos, tutorials, slides and materiales will be available to the students on Egela platform. All the indications related to the tasks of the continuous evaluation will also be published in this virtual platform.

BIBLIOGRAFÍA

Basic bibliography

Lind, D. A., Marchal, W. G. and Wathen, S. A. (2017) Statistical techniques in business & economics
McGraw-Hill

Lind, D. (2012) Basic Statistics for Business and Economics. Mac Graw- Hill

Newbold, P and Carlson, W. (2010): Statistics for Business and Economics. Prentice Hall.

Detailed bibliography

-Doane, D and Seward, L (2018):Applied Statistics in Business and Economics. McGraw Hill.

-Moore, D.S. (2007, 4th ed.). The basic practice of statistics. N.Y: Freeman & Com.

-Ross (2001). Probability and Statistics for Engineers and Scientists. Academic Press, London.

-Urdan, T.C. (2010, 3rd ed.). Statistics in Plain English. N.Y: Routledge.

-Wheelan, C. (2014) Naked statistics: stripping the dread from the data. New York: W. W. Norton. Chicago

Journals

At this level of basic statistics, instead of specialized magazines, informative materials (mainly extracted from the media) will be used.

Web sites of interest

http://onlinestatbook.com/
Online Statistics Education: An Interactive Multimedia Course of Study, developed by Rice University , University of Houston Clear Lake, and Tufts University

www.eustat.es

OBSERVATIONS

Se utlizará la plataforma eGela, donde se colgarán todos los materiales básicos necesarios