Universidad Zaragoza

Academic Year/course: 2024/25

27610 - Statistics II

Syllabus Information

Academic year: 2024/25
Subject: 27610 - Statistics II
Faculty / School: 109 - Facultad de Economía y Empresa
Degree: 450 - Degree in Marketing and Market Research
ECTS: 6.0
Year: 2
Semester: First semester
Subject type: Compulsory
Module:

1. General information

The main goal of this subject is that the student has the ability to apply and interpret the basic statistical tools for the understanding and management of random phenomena related to the field of marketing and market research. He/she will have a preferably practical profile to be able to analyze, solve and interpret economic realitiesin order to make decisions with scientific rigor

The approaches and goals are aligned with Goal 4 (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), specially, sub-goals 4.4 (increase skills to access employment) and 4.C (improve teacher qualifications) and 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment, and work) providing the theoretical and practical foundations to carry out more efficient data analysis that enables the achievement of said goals.

No prerequisites are required to take this year, although it is recommended to have passed Mathematics I and II and Statistics I of the first year.

2. Learning results

- Deepen the knowledge of the fundamentals, concepts and statistical methods for the analysis of economic realities.
- Understand and use probability as a measure of uncertainty in economic phenomena.
- Employ and plan sampling methods to extract information from an economic phenomenon.
- Know and apply inferential statistical techniques in order to make decisions with scientific rigor.
- Obtain, with the support of ICT, the statistical results necessary to estimate or contrast statements about the analyzed data, measuring the guarantees of the decisions taken.
- Infer and corroborate the properties of theoretical models from observations of a random sample and justify the goodness of fit of the model to the information obtained.

3. Syllabus

BLOCK 1. CALCULATION OF PROBABILITIES

UNIT 1: Discrete random variable

Concept of random variable.

Classification into discrete and continuous random variables.

Probability distribution of a discrete a.v. and its characteristics.

Noteworthy Distributions

UNIT 2: Continuous random variable

Probability distribution of a continuous a.v. and its characteristics.

Notable distributions

BLOCK 2. INTRODUCTION TO SAMPLE THEORY

UNIT 3: Introduction to Sample Theory

Basic concepts.

Random sampling with and without replacement.

Sampling distribution of a statistic.

Sample size determination

BLOCK 3. INFERENTIAL METHODS

UNIT 4: Point and interval estimation

Concept of estimator.

Point estimate.

Interval estimation: pivotal method, Notable confidence intervals for mean, variance and proportion UNIT 5: Hypothesis testing

Basic concepts: hypothesis, significance level and power.

Notable parametric contrasts.

Normality contrasts

BLOCK 4. TWO-DIMENSIONAL ANALYSIS

UNIT 6: Two-dimensional inference

Analysis of two populations. Independent and paired samples.

Statistical inference to compare means, proportions and variances.

Analysis of categorical variables: Contingency tables

4. Academic activities

Master classes: 30 hours

Practical classes: 30 hours

Personal Study: 85 hours

Assessment tests. 5 hours

6 ECTS = 150 hours

Lectures will be used to develop the concepts and techniques of each topic, using expository techniques, but encouraging participation and class discussion with students. The practical classes will be used to show to the student how to approach and solve problems using computer tools such as developments in the regular classroom.

In principle, the teaching methodology and its evaluation is planned to be based on face-to-face classes . However, if circumstances so require, they may be carried out online

5. Assessment system

The subject will be evaluated globally both in the first and second call.

In the first call, the evaluation will be based on two different tests: a theoretical-practical test and a practical test with a computer.

Theoretical-practical test, to be taken on the official date established by the Centre, consists of the resolution of problems and theoretical-practical questions similar to those solved in the practical blackboard classes and master classes.

The computer-based practical test (FP) consists of solving problems using the statistical program ***RCommander*** as a calculation tool. This test P is composed of two tests related to the practical part: P1 (topics 1 to 3) and P2 (topics 4 to 6). In order to pass this test, a minimum score of 3 points must be obtained in each of them.

The grade P is given by the formula PP= (P1 + P2)/2

Those students who, having anticipated P1, have obtained less than 3 points, will have to take the final practical exam PF in which all the subjects of the subject will be examined.

The theoretical-practical test of the subject (T) will have a weight of 60% in the Final Grade and the practical test with computer (P or PF) will have a weight of 40%.

In the first call, there are two possibilities:

Students who only take the theoretical-practical test (T) and P2, since they have anticipated P1 during the semester by obtaining at least 3 points in it.

Students who take the complete test (T and PF) on the final exam

The final overall evaluation grade will be calculated as follows, provided you have at least a 3 on each of the two tests: T and P/PF:

Final Note = 0.6T+ 0.4max{P,PF} if min{T,max{P,PF}} $\geq$ 3

Otherwise the final grade will be min{T,max{P,PF}}.

To pass the subject, the student must obtain a Final Grade greater than or equal to 5. If the Final Grade is less than 5, student must present himself/herself in the second round. This will be the same as the global test of the first call.

In the second call, the student must take the complete test (T and PF) and the final grade will be determined by the formula.

Final Note = 0.6T+ 0.4PF if $\min\{T,PF\} \geq 3$

Otherwise the final grade will be $\min\{T,PF\}$.

If a student has failed the first exam, but has passed (5 or more points) one of the two parts (theory or practical), the mark of the part passed will be kept for the second exam as long as in the part not passed he/she obtains 3 or more points, not being necessary to retake the exam again.

6. Sustainable Development Goals

4 - Quality Education
8 - Decent Work and Economic Growth