

27610 - Statistics II

Syllabus Information

Academic Year: 2022/23

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

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process proposed for this module is based on the following premises:

Several teaching methods will be used in the learning process, based on the objectives set and the competences to develop. Explanatory techniques will be used in the lectures, aiming to analyze and develop the basic concepts of the subject, and collaborative training techniques will be used to get the student involved in order to develop her/his ability to organize, plan and make decisions.

Furthermore, computer tools and solving case studies will be used to tackle the competences related to the use of technological tools, problem solving and ability to analyze and extract information from external sources. Moreover, the classroom practicals will enable the student to develop the capacity to adapt to new situations and apply the knowledge acquired in professional practice.

The learning platform Moodle (<http://moodle2.unizar.es>) will provide the educational support. All the documentation and material needed for the lectures and the classroom practicals and the associated information, including this teaching guide will be published in this platform.

The teaching methodology is planned for face-to-face classes. However, if necessary for health reasons, teaching could be delivered on line

4.2. Learning tasks

Lectures (30 classroom hours and 45 autonomous working hours): Will be used mainly to

introduce the basic concepts and the theoretical developments of each lesson. Explanatory techniques will be used, always promoting participation and discussion in the classroom. The teacher's explanations will be supported by a presentation and by the development of the corresponding conceptual map. Class attendance, participation and note-taking are highly recommended. The presentation, its complementary theoretical developments and the conceptual map will be published in advance.

Classroom practicals (12 classroom hours and 15 autonomous working hours): This activity aims to show the student how to deal with problems. This activity will take place in computer rooms and the student will work with problems, either in the blackboard or using the computers.

Small group classes (4 classroom hours and 4 autonomous working hours): Will take place in the computer room within the established hours. The goal of these sessions is to help the student to acquire skill and fluency in the resolution of statistical problems with the computer.

The assessment will be prepared to be carried out as face-to-face examination. but if health circumstances do not allow it. they will be carried out by doing it entirely online or in a blended way. In the case of online exams. it is important to highlight that. the student may be recorded, and he or she can exercise his or her rights by the procedure indicated in.

https://protecciondatos.unizar.es/sites/protecciondatos.unizar.es/files/users/lopd/gdocencia_reducida.p

The necessary software will be used to check the possibility of plagiarism. The detection of plagiarism or copying in an activity will imply that the activity or exam will be marked 0/10.

4.3. Syllabus

Section 1. Discrete and continuous random variable

Unit 1: Discrete random variable.

Random variables. Probability distribution. Discrete and continuous random variable. Discrete random variable: Probability distribution or mass function. Expected value and its properties. Binomial, Hypergeometric and Poisson distributions.

Unit 2: Continuous random variable.

Continuous random variable: density and probability density functions. Uniform, Exponential and Gamma distributions. Continuous approximations for discrete distributions.

Section 2. Introduction to sampling theory

Unit 3 Introduction to sampling theory.

Basic concepts: population, sample, parameter and statistics. Sampling methods. Sampling distribution of statistics: Exact, Monte Carlo and asymptotic methods. Sample-size determination.

Section 3. Inferential methods: estimation and hypothesis tests

Unit 4: Point and interval estimation.

Estimation. Building estimators. Properties of estimators. Confidence interval. Methods of finding interval estimators: the pivot method. Confidence intervals for estimation of means, proportions and variances.

Unit 5: Parametric hypotheses.

Basic concepts: Simple, compound, null and alternative hypotheses, significance level, power of a test. Maximum power tests: Neyman-pearson lemma. Likelihood-ratio test. Tests of the mean and variance of a normal distribution, tests of the population proportion. Goodness of fit tests.

Section 4. Two-population analysis

Unit 6: Bi-dimensional inference.

Two-population analysis. Independent and paired samples. Comparing proportions, means and variances. Contingency tables.

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Faculty of Economics and Business website (<https://econz.unizar.es/>)