Statistics I

Academic Year: (2021 / 2022) **Review date: 23-06-2021**

Department assigned to the subject: Statistics Department

Coordinating teacher: JIMENEZ RECAREDO, RAUL JOSE

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Social Sciences and Law

OBJECTIVES

SPECIFIC COMPETENCES: To acquire knowledge and understanding to
1. Carry out statistical analysis of univariate and bivariate data.
2. Formulate and solve basic probability problems.
3. Formulate, apply and solve basic probabilistic models.
4. Obtain point estimators for the parameters of some probabiliity distributions.
5. Estimate by confidence intervals the mean of a population.
6. Apply statistical methods through software.

TRANSVERSAL COMPETENCES:
1. Capacity for analysis and synthesis.
2. Use of statistical software.
3. Resolution of problems.
4. Teamwork.
5. Critical reasoning.
6. Oral and written communication.

DESCRIPTION OF CONTENTS: PROGRAMME

PROGRAMME

1. Introduction.
1.1. Concepts and use of Statistics.
1.2. Statistical terms: populations, subpopulations, individuals and samples.
1.3. Types of variables.

2. Analysis of univariate data.
2.1. Representations and graphics of qualitative variables.
2.2. Representations and graphics of quantitative variables.
2.3. Numerical summaries.

3. Analysis of bivariate data.
3.1. Representations and graphics of qualitative and discrete data.
3.2. Representations and numerical summaries of quantitative data: covariance and correlation.

4. Probability.
4.1. Random experiments, sample space, elemental and composite events.
4.2. Definition of Probability and Properties. Conditional Probability and the multiplication Law. Independence.
4.3. The law of total probability and Bayes theorem.

5. Probability models.
5.1. Random variables. Discrete random variables: The probability function and the distribution function. Mean and variance of a discrete random variable.
5.2. Continuous random variables: The density function and the distribution function. Mean and variance of a continuous random variable.
5.3. Probability models. Discrete probability models: Bernoulli, Binomial and Poisson.
5.4. Continuous probability models: Uniform, Exponential and the normal distribution.
5.5. Central limit theorem.

6. Introduction to Statistical Inference.
6.1. Parameter point estimation.
6.2. Goodness-of-fit to a probability distribution. Graphical methods.
6.3. Introduction to confidence interval estimation.

LEARNING ACTIVITIES AND METHODOLOGY

14 theory classes with supporting material available on Aula Global, and 14 practical classes including problem solving sessions and virtual computer labs accessing through laptops in class. No group tutoring sessions are foreseen except possibly during the class-recovery week at the end of the semester.

ASSESSMENT SYSTEM

40% of the course grade will be obtained through a final exam. The remaining 60% will be obtained through two midterm exams (30%+30%). The exams can contain application exercises, theoretical questions, and questions related to the computer labs.

% end-of-term-examination:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

BASIC BIBLIOGRAPHY

- Newbold, P. Statistics for business and economics, Prentice-Hall, 2012
- Triola, Mario F. Essentials of Statistics, Pearson, 2015