Statistics I

Academic Year: (2019 / 2020) **Review date: 30-04-2020**

Department assigned to the subject: Statistics Department

Coordinating teacher: MOLINA FERRAGUT, ELISENDA

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 Theoretical support materials available on the Web, and 14 sessions based on problem-solving sessions and practical computing. No group tutorials except during the last week.

ASSESSMENT SYSTEM

50% of the course grade will be obtained through a final exam. The remaining 50% will be obtained through two midterm exams (20%+20%), tasks to be delivered in the computing labs (5%), and exercises to be done in some theory classes (5%). The exams can contain application exercises, theoretical questions, and questions related to the computing labs.

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

BASIC BIBLIOGRAPHY

- Newbold, P. Statistics for business and economics, Prentice-Hall, 2012

- Triola, Mario F. Essentials of Statistics, Pearson, 2015