

Academic Year: (2021 / 2022)

Review date: 04-06-2021

Department assigned to the subject: Statistics Department

Coordinating teacher: LILLO RODRIGUEZ, ROSA ELVIRA

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

Branch of knowledge: Social Sciences and Law

OBJECTIVES

1. Knowledge on expected properties for point estimators.
2. Estimation of unknown parameters by: the maximum likelihood method, the moments method and the resampling techniques.
3. Construct confidence intervals and parametric hypotheses tests.
4. Understand the difference between classic inference and bayesian inference.
5. Obtain computer skills related to the previous points.

CROSS OBJECTIVES

1. Ability to do comparisons among different alternatives-
2. to Work in groups.
3. To be capable of using creative thoughts when it comes to solve problems.
4. Critical Reasoning.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Basic notions of statistical inference.
 - 1.1. Random sample and estimators.
 - 1.2. Sampling distributions of statistics for one and two populations.
2. Introductions to estimators.
 - 2.1. Properties of estimators.
 - 2.2. Moment method.
 - 2.3. Maximun likelihood method.
3. Confidence intervals .
 - 3.1. Confidence intervals for one sample.
 - 3.2. Confidence intervals for two samples.
4. Introduction to the hypothesis tests.
 - 4.1. Basic definitions
 - 4.2 Null and alternative hypothesis.
 - 4.3. Type I and Type II errors.
 - 4.4. Power in a test.
 - 4.5 Methodology related to a hypothesis test.
 - 4.6 Definition and interpretation of the p-value.

LEARNING ACTIVITIES AND METHODOLOGY

Theory (4 ECTS). Lectures with available material posted in internet. Problems (2 ECTS) Problem Solving classes. Computer work in classrooms conditioned for that purpose. Work assignments in groups.

ASSESSMENT SYSTEM

Final exam (35%). An empiric project in groups (25%). Quiz (20%) A take home work with real data (15%). At least a grade of 4 is required in the final written exam to have in account the continuous assessment.

% end-of-term-examination:	35
% of continuous assessment (assignments, laboratory, practicals...):	65

BASIC BIBLIOGRAPHY

- Berry, D. E. Statistics, a bayesian perspective, Duxbury Press.
- Casella, G. y Berger, R. L. Statistical Inference, Wadsworth and brooks.
- Durá Peiró, J.M. y López Cuñat, J Fundamentos de Estadística. Estadística descriptiva y modelos probabilísticos para la inferencia., Ariel.
- Efron, B. y Tibshirani, R.J. An introduction to the bootstrap, Chapman y Hall.
- Peña, D. Introducción a la Estadística, Alianza Editorial.
- Ruiz-Maya, L y Martín-Pliego, F.J. Fundamentos de Inferencia Estadística, Paraninfo, 2005

ADDITIONAL BIBLIOGRAPHY

- Gonick, L. y Smith , W. La Estadística en cómics., Zembrera Zariquiey.
- Rice, J. Mathematical Statistics and data Analysis., Brooks & Cole..
- Vélez, R. y García, A. Principios de Inferencia Estadística., UNED.