

Academic Year: (2023 / 2024)

Review date: 24-04-2023

Department assigned to the subject: Statistics Department

Coordinating teacher: MINGUEZ SOLANA, ROBERTO

Type: Compulsory ECTS Credits : 5.0

Year : 1 Semester : 1

OBJECTIVES

- * To know exploratory data analysis.
- * To know concepts and properties of probability calculus and random variables.
- * To know the estimates construction methods and the estimates properties.
- * To understand the concept of confidence interval and its applications.
- * To know hypotheses testing, including the notion of p-value.
- * To know basic concepts of non-parametric inference.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Exploratory data analysis (EDO)
 - 1.1 Descriptive measures.
 - 1.2 Graphics and diagrams
- 2 Introduction to Probability calculus
 - 2.1 Bases of Probability theory
 - 2.2 Random variables.
 - 2.3 Distributions.
 - 2.4 Independence and transformations.
 - 2.5 Expectation.
- 3 Point estimation and interval estimation
 - 3.1 Introduction: Estimation problems.
 - 3.2 Examples.
 - 3.3 Properties of estimators.
 - 3.4 Construction of estimators.
 - 3.5 COnfidence intervals.
4. Hypothesis tests
 - 4.1 Introduction: hypothesis, errors and function of power.
 - 4.2 p-value.
 - 4.3 Inference for one and two samples.
5. Non-parametric inference
 - 5.1 Chi-squared test for distribution fitting.
 - 5.2 Kolmogorov-Smirnov test for distribution fitting.

LEARNING ACTIVITIES AND METHODOLOGY

The course will consist of lectures and problem-solving sessions.
Tutorships will be scheduled according to the time of classes.

ASSESSMENT SYSTEM

Final exam.
2 assignments associated with the analysis of real data (by groups of students)

% end-of-term-examination:	50
% of continuous assessment (assignments, laboratory, practicals...):	50

BASIC BIBLIOGRAPHY

- Wasserman, L (2004) All of Statistics, Springer-Verlag. New York.

ADDITIONAL BIBLIOGRAPHY

- Anderson, D. R., Sweeney, D. J., & Williams, T. A. Statistics for business and economics , South-Western Cengage Learning, 2013
- Arnold, S.F. (1990) Mathematical Statistics, Prentice Hall. New York.
- Bain, L.J. and Engelhardt, M. (2000) Introduction to Probability and Mathematical Statistics, Duxbury Classic. Boston.
- Bickel, P.J. and Doksum, K.A. (2006) Mathematical Statistics- Second edition, Holden Day. San Francisco.
- Casella, G. and Berger, R.L. (2012) Statistical Inference - Second edition, Wadsworth and Brooks/ Cole. San Francisco.
- Dudewicz, E.J. and Mishra, S.N. (1988) Modern Mathematical Statistics, Wiley. New York.
- Gibbons, J.D. and Chakraborti (2010) Nonparametric Statistical Inference. Fifth Edition, Marcel Dekker. New York.
- Rice, J. (2006) Mathematical Statistics and Data Analysis. Third edition, Brooks and Cole. San Francisco.
- Van der Vaart, A.W. (2001) Asymptotic Statistics, Cambridge University Press. Cambridge.
- Wooldridge, J. M. Introductory econometrics: a modern approach, Cengage Learning: South Western Educ. Pub, 2020