Multivariate Analysis II

Academic Year: (2023 / 2024) **Review date: 20-04-2023**

Department assigned to the subject: Statistics Department

Coordinating teacher: GALEANO SAN MIGUEL, PEDRO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Exploratory Data Analysis
Elemental Statistical Theory I
Elemental Statistical Theory II
Statistical Inference Methods I
Statistical Inference Methods II
Mathematical Methods I
Mathematical Methods II
Advanced Mathematical Methods I
Advanced Mathematical Methods II
Multivariate Analysis
Regression Analysis

OBJECTIVES

COMPETENCES
1. Acquire skills in dimension reduction techniques such as factor analysis, multidimensional scaling and the correspondence analysis.
2. Acquire skills in heterogeneity problems such as clustering.
3. Capacity for analyzing dependency between multivariate variables by means of multivariate regression and canonical correlation analysis.
4. Know marketing and financial applications of multivariate techniques.
5. Handle statistical software for multivariate analysis.

SKILLS
1. Aptitude to understand a real problem and to analyze it as an statistical problem.
2. Modeling and solving problems.
3. Capacity of analysis and synthesis.
4. Oral and written skills.
5. Aptitude to work in a group.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction.
   1.1 Where do we come from?
   1.2 Whre do we go?
2. Cluster analysis.
   2.1 Introduction.
   2.2 Partition methods.
   2.3 Hierarchical methods.
3. Multidimensional Scaling.
   3.1 Introduction.
   3.2 Distances, proximities and dissimilarities.
   3.3 Metric multidimensional scaling.
4. Factor analysis.
   4.1 Introduction.
   4.2 The factor model.
   4.3 Estimation of the factor model parameters.
   4.4 Rotations in the factor model.
   4.5 Factor model scores.
   4.6 Alternative procedures.
5. Multivariate regression.

5.1 Introducition.
5.2 Univariate regression.
5.3 Multivariate regression.
6. Canonical correlation analysis.
6.1 Introduction.
6.2 Canonical correlations.

LEARNING ACTIVITIES AND METHODOLOGY

Theory (4 ECTS): Theoretical classes with support material taken from the web.
Practical classes (2 ECTS): Problem solving classes. Computing classes in computer halls. Work assignments in groups. Oral presentations and debates.
Tutorial classes before the midterm exams.
Tutorial classes during the week 15.

ASSESSMENT SYSTEM

Final exam (50%). More than 4 out of 10 is required in the final exam to pass the course.
Midterm exam (30%)
Resolution of exercises and labs (20%)

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

BASIC BIBLIOGRAPHY

- Richard A. Johnson and Dean W. Wichern Applied Multivariate Statistical Analysis, Pearson Education, 2007