Multivariate Analysis

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

Department assigned to the subject: Statistics Department

Coordinating teacher: GRANE CHAVEZ, AUREA

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Probability I
Probability II
Statistical Inference Methods I
Statistical Inference Methods II
Linear Algebra
Calculus I
Calculus II
Advanced Mathematics
Programming I
Programming II

OBJECTIVES

1. Capacity for identifying problems associated with statistical data in several variables.
2. Acquire skills in multivariate data description.
3. Know the properties of multivariate distributions.
4. Capacity for making hypothesis testing on multivariate populations.
5. Know several types of statistical distances.
6. Acquire skills in data representation and dimension reduction techniques.
7. Acquire skills in clustering and classification techniques.
8. Handle statistical software for multivariate analysis.

1. Aptitude to understand a real problem and to analyze it as a 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
2. Multivariate data
3. Multivariate Normal distribution
4. Principal component analysis
5. Multivariate analysis of variance
6. Distances and multidimensional scaling
7. Cluster analysis
8. Discriminant analysis

LEARNING ACTIVITIES AND METHODOLOGY

Competences will be acquired by students from:

1. Theory classes: one per week (14 sessions)

2. Practical classes with laptop: one per week (14 sessions)

Former activities will be devoted to exercises, problems, data examples, and case studies. Teaching will make intensive use of the resources available in Aula Global and Aula Vrtual.

ASSESSMENT SYSTEM

Continuous evaluation: 60%

It will consist in three delivery tasks related to multivariate data anlaysis and inference, data visualization and dimensionality reduction techniques, and clustering methods. Class attendance and participation will be taken into account in the grading process.

Final exam: 40%

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

BASIC BIBLIOGRAPHY

- JOHNSON, R. A. and WICHERN, D. W. Applied multivariate statistical analysis, 6th Edn, Pearson Prentice Hall., 2007

ADDITIONAL BIBLIOGRAPHY

- Baíllo, A., Grané, A. 100 problemas resueltos de Estadística Multivariante (implementados en Matlab), Delta Publicaciones, 2007