
Academic Year: (2023 / 2024)**Review date: 11-08-2023**

Department assigned to the subject: Statistics Department**Coordinating teacher: GRANE CHAVEZ, AUREA****Type: Compulsory ECTS Credits : 3.0****Year : 1 Semester : 1**

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Mathematics for Data Science
Probability
Statistical Inference
Programming in R
Numerical Methods for Data Science

OBJECTIVES

The main course objectives are:

1. Understand and analyze multidimensional data sets, including techniques for handling and interpreting data in multiple dimensions.
2. Gain proficiency in principal component analysis, a method for reducing the dimensionality of data while preserving its important features.
3. Explore various distance measures and joint metrics used to quantify similarities and differences between data points in multidimensional space.
4. Learn and apply multidimensional scaling techniques to visualize and understand the underlying structure of complex data sets.
5. Develop the skills to perform cluster analysis, a method for identifying meaningful groups within data based on similarity.
6. Study correspondence analysis and its application in exploring relationships between categorical variables in multidimensional data.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Multidimensional data sets
2. Principal component analysis
3. Distances and joint metrics
4. Multidimensional scaling
5. Cluster analysis
6. Correspondence analysis

LEARNING ACTIVITIES AND METHODOLOGY

Learning activities:

Theoretical classes
Practical classes
Tutorials
Team work

Individual work of the student
In-person evaluation tests

Methodology to be used:

Theoretical classes with support material available on Aula Global.
Problem solving classes. Computational practices in computer rooms. Oral exhibitions

Tutorial regime:

Individual tutorials throughout the course.

ASSESSMENT SYSTEM

% end-of-term-examination:	0
% of continuous assessment (assignments, laboratory, practicals...):	100
Group project: two deliveries (40%+50%)	
Oral presentations (10%)	

BASIC BIBLIOGRAPHY

- Alan Julian Izenman Modern Multivariate Statistical Techniques, Springer, 2008
- Richard A. Johnson and Dean W. Wichern Applied Multivariate Statistical Analysis, Pearson Education, 2007