

Academic Year: ( 2019 / 2020 )

Review date: 23-04-2019

Department assigned to the subject: Statistics Department

Coordinating teacher: GALEANO SAN MIGUEL, PEDRO

Type: Electives ECTS Credits : 6.0

Year : Semester :

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

Basics of Statistics

**OBJECTIVES**

CB1. That students have demonstrated to possess and understand knowledge in an area of study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of his field of study

CB3. That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific or ethical nature

CG3. Be able to manage, identify, gather and interpret relevant information on issues related to the business field in the digital age.

CT3. Be able to evaluate the reliability and quality of the information and its sources using such information in an ethical manner, avoiding plagiarism, and in accordance with the academic and professional conventions of the study area.

CT5. Know and be able to handle interpersonal skills on initiative and responsibility, negotiation, emotional intelligence, etc. as well as calculation tools that allow to consolidate the basic technical skills that are required in every professional field.

CE15. Know the main technology products and technology trends associated with the world of management and business, and know how to design their implementation and innovation in organizations

CE16. Understand the possibilities of Big Data and artificial intelligence in business development, and know their implementation needs and their capabilities in improving business processes Knowing how to analyze and solve a problem in the disciplinary field of the Degree applying knowledge, skills, tools and strategies acquired or developed in it.

RA1. Have acquired advanced knowledge and demonstrated an understanding of the theoretical and practical aspects and the methodology of work in the field of business administration and digital technology with a depth that reaches the forefront of knowledge

RA3. Have the ability to collect and interpret data and information on which to base their conclusions including, when necessary and appropriate, reflection on social, scientific or ethical issues in the field of the digital age company.

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Introduction to the analysis of multivariate data with R.
  - 1.1 Multivariate data.
  - 1.2 Introduction to R for the analysis of multivariate data.
2. Data visualization: Principal Component Analysis.
  - 2.1 Introduction to data visualization.
  - 2.2 Principal Components.
  - 2.3 Practical cases.
3. Data visualization: Multidimensional scaling.
  - 3.1 Multidimensional scaling.
  - 3.2 Practical cases.
4. Classification: linear discriminant analysis.
  - 4.1 Supervised classification.
  - 4.2 Linear discriminant analysis.
  - 4.3 Quadratic discriminant analysis.
  - 4.4 Practical cases.

5. Classification: logistic regression.
  - 5.1 Logistic regression.
  - 5.2 Practical cases.
6. Classification: Naive Bayes classifier.
  - 6.1 Naive Bayes.
  - 6.2 Practical cases.
7. Data segmentation: Cluster analysis. Hierarchical cluster and k-means algorithm.
  - 7.1 Non-supervised classification.
  - 7.2 Hierarchical methods.
  - 7.3 Partitioning methods: K-means algorithm.
  - 7.4 Partitioning methods: Alternatives to k-means.
8. Introduction to non-linear prediction.
  - 8.1 Linear prediction.
  - 8.2 Non-linear prediction.

#### LEARNING ACTIVITIES AND METHODOLOGY

AF1. THEORETICAL-PRACTICAL CLASSES. They will present the knowledge that students should acquire. They will receive the class notes and will have basic texts of reference to facilitate the follow-up of the classes and the development of the subsequent work. Exercises, practical problems on the part of the student will be solved and workshops and evaluation tests will be carried out to acquire the necessary skills.

AF2. TUTORIES. Individualized assistance (individual tutorials) or group (collective tutorials) to students by the teacher.

AF3. INDIVIDUAL OR GROUP STUDENT WORK.

MD1 THEORY CLASS. Exhibitions in the teacher's class with support of computer and audiovisual media, in which the main concepts of the subject are developed and the materials and bibliography are provided to complement the students' learning.

MD2. PRACTICES. Resolution of practical cases, problems, etc. raised by the teacher individually or in groups.

MD3. TUTORIES. Individualized assistance (individual tutorials) or group (collective tutorials) to students by the teacher. For subjects of 6 credits, 4 hours will be dedicated with 100% of attendance.

#### ASSESSMENT SYSTEM

SE1. FINAL EXAM. In which the knowledge, skills and abilities acquired throughout the course will be assessed globally.

SE2. CONTINUOUS ASSESSMENT. It will assess the work, presentations, performance in debates, classroom presentations, exercises, practices and work in the workshops throughout the course.

<b>% end-of-term-examination:</b>	40
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	60

#### BASIC BIBLIOGRAPHY

- Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani An introduction to statistical learning, Springer, 2013
- Trevor Hastie, Robert Tibshirani and Jerome Friedman The Elements of Statistical Learning, Springer, 2009