Master's Thesis

**Academic Year: ( 2021 / 2022 )** **Review date: 08-06-2021**

**Department assigned to the subject: Computer Science and Engineering Department, Signal and Communications Theory**

**Coordinating teacher: RUIZ MORA, CARLOS**

**Type: Master Final Project ECTS Credits : 6.0**

**Year : 1 Semester : 2**

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

All courses in the Master.

## OBJECTIVES

Basic competences
The students should be able to apply the knowledge obtained through the Master and their problem solving abilities to new situations within multidisciplinar settings related to their fields of interest
The students should be able to use their acquired knowledge to make judgements based on incomplete or limited information. These judgements should take into account aspects related to social and ethical responsibility issues
The students should be able to communicate their conclusions and the knowledge that supports them to both specialized and general audiences in a clear and unambiguous manner
The students should possess the learning skills that would allow them to continue their studies in an autonomous and self directed manner

General competences
To identify the data analysis techniques that are more suitable for a given problem. To know how to apply them to the analysis, design and solution of these problems
To obtain practical and efficient solutions to treat large data sets, both individually and as part of a team
To apply data analysis techniques to real large-scale data, including Web data
To summarize the conclusions obtained from this analysis and to present it in a clear and convincing manner to a bilingual audience, both orally and in writing
To be able to generate new ideas (creativity) and to anticipate new situations, in the context of data analysis and decision making problems

Specific competences
To identify the opportunities that the data analysis techniques may offer for the improvement of the activities of organizations and companies
To use advanced statistical techniques in the treatment of large data sets in areas such as estimation, inference, forecasting or classification, and to apply them in an efficient manner
To design systems for data processing, from their collection and initial processing, to their statistical treatment and the presentation of the final results
To identify opportunities for the application of machine learning techniques to the solution of real problems
To conduct the analysis and design of computer applications based on machine learning techniques
To apply advanced data treatment procedures to problems in areas of special relevance to society
To use advanced techniques in the treatment of large data sets
To make use of distributed platforms for the distribution of content and of techniques for the maintenance of their topology
To make decisions for e-learning systems to improve learning processes based on the information extracted from learning applications and systems
To understand and use in an efficient manner the architecture of data centers, including their computation systems and their communications

Learning results
- To be able to apply the techniques presented in the different subjects of the Master program to the analysis of data from a specific problem
- To obtain results that can be applied to the improvement of the activities of an organization or company/To be able study in depth advanced data analysis procedures
- To be able to present results and conclusions in a clear and effective manner
- To make use of all the knowledge and competences acquired throughout the Master program

## DESCRIPTION OF CONTENTS: PROGRAMME

The Master's Thesis is organized as an exercise in the treatment of data and its analysis to improve the performance of a relevant organization or company.
The students will be offered different alternative fields in which to complete this Thesis. They will also receive support and orientation throughout the completion of the Thesis.
The students will collect the data of interest, apply the relevant techniques to these data, and present the results in a clear and useful manner.
As an alternative, it will also be acceptable to conduct a study in depth of some advanced data analysis technique for large-scale data sets. This study would include both theoretical and computational aspects relevant to its efficient implementation.

## LEARNING ACTIVITIES AND METHODOLOGY

Learning activities
Tutorial clases
Individual work of the student

Methodology
Reading and critical commentary of texts recommended by the class instructor: news articles, reports, textbooks and/or scientific journal articles. These readings should be discussed in class, or at least they should provide a basis to expand and consolidate the knowledge required to complete the Master Thesis.
Preparation of individual or team reports or homeworks.

TFM specific regulations:
http://www.uc3m.es/ss/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobheadername1=Content-Disposition&blobheadername2=Cache-Control&blobheadervalue1=attachment%3B+filename%3D%22NORMA_TFM_GENERAL.pdf%22&blobheadervalue2=private&blobkey=id&blobtable=MungoBlobs&blobwhere=1371547511386&ssbinary=true

## ASSESSMENT SYSTEM

Publicly defense of the Master's Thesis

The University uses the Turnitin Feedback Studio program within the Aula Global for the delivery of student work. This program compares the originality of the work delivered by each student with millions of electronic resources and detects those parts of the text that are copied and pasted. If the student has correctly made the appointment and the bibliographic reference of the documents he uses as a source, Turnitin will not mark it as plagiarism.