

## 62225 - Management of Large-Scale Data

### Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	534 - Master's in IT Engineering
ECTS	6.0
Course	1
Period	Second semester
Subject Type	Compulsory
Module	---

### 1. Basic info

#### 1.1. Recommendations to take this course

#### 1.2. Activities and key dates for the course

### 2. Initiation

#### 2.1. Learning outcomes that define the subject

#### 2.2. Introduction

### 3. Context and competences

#### 3.1. Goals

#### 3.2. Context and meaning of the subject in the degree

#### 3.3. Competences

#### 3.4. Importance of learning outcomes

### 4. Evaluation

### 5. Activities and resources

#### 5.1. General methodological presentation

The learning process of this course is based on:

Face-to-face teaching and learning activities are based on:

- Class. Exposition of contents through the presentation or explanation by a professor (possibly, including demos, where applicable).
- Talks by experts. When possible, experts outside the university will expose or explain some contents.
- Seminar. Period of instruction based on oral or written contributions by the students.
- Problem-based learning. Educative approach oriented towards a teaching and learning modality where students tackle real problems in small groups under the supervision of a tutor.

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- Practical classes. Any practical or collaborative activity in class.
- Lab. Activities developed in special spaces with specialized equipment (labs, computer labs).
- Tutoring. Period of instruction performed by a tutor with the goal of revising and discussing materials and topics presented in class.
- Evaluation. Set of written/oral tests, lab assignments, projects, other assignments, etc., used to evaluate the progress of students.

### Personal teaching and learning activities are based on:

- Theoretical assignments. Preparing seminars, perform readings, research, perform assignments or write reports, etc., to be exposed or delivered to the professor in theory classes.
- Practical assignments. Preparing activities to be exposed or delivered to the professor in practical classes.
- Theoretical study. Study of contents related with the "theory classes": it includes any study activity not considered previously (study for exams, work in the library, perform complementary readings, solve problems and exercises, etc.).
- Practical study. Related with the "practical classes".
- Complementary activities. They are non-academic tutoring sessions and formative activities related with the course, but not with the preparation of exams or with the evaluation: readings, seminars, videos, etc.

### 5.2.Learning activities

The program helps achieving the expected learning goals by including the following activities...

- Theoretical classes.
- Solving problems and cases.
- Lab sessions.

### 5.3.Program

- Introduction and motivation to the problem of large volumes of data (Big Data).
- Storage of large amounts of data:
  - o Data warehouses. Star schema design.
  - o NoSQL databases.
- Management of large amounts of data:
  - o Data distribution.
  - o Information integration considering heterogeneous data sources.
  - o Use of knowledge representation techniques (ontologies) to represent data sources and their access and integration.
  - o Parallel processing techniques: MapReduce (Hadoop).
  - o Data Stream Management Systems.
  - o Other techniques: mobile agents.
- Interaction with large amounts of data:
  - o Visualization techniques.
  - o Design of appropriate user interfaces.
  - o Usability.
- Analysis of large amounts of data:
  - o Data mining.
  - o Sentiment analysis.
  - o Text mining.
- Use cases and applications, such as:
  - o Data provided by sensors.
  - o Unstructured data on the Web.
  - o Recommendation Systems.
  - o Analysis of blogs and social networks.
  - o Smart cities.
  - o Intelligent Transportation Systems.

### 5.4.Planning and scheduling

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The calendar of classes, lab sessions and exams, as well as the dates of delivery of evaluation assignments, will be announced in advance, according to the sessions and dates established by the School.

### **5.5. Bibliography and recommended resources**