**COURSE : Data Management for Big Data Analysis**

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**COURSE BACKGROUND**

The modules focuses on providing an introduction to the main issues and solutions in the representation of management of large amounts of data . Database management systems have been traditionally used for data management at the least from the 1960’s, with the relational model becoming of widespread use from the 1970’s. However, the need of dealing with large amounts of, possibly unstructured, data has led on one side to the integration of databases into data-warehouses and, on the opposite, to the introduction of data storage tools (such as NoSQL systems) which provide more efficiency in data management, albeit at the cost of reduced data integrity control. In this module, the main characteristics of all such approaches to data representation and management will be described, together with an introduction to sample tools and systems.

**LEARNING OBJECTIVES**

At the end of the module, the student should be

1. informed on the main issues and approaches to data modeling and management
2. able to identify the most suitable data management approach in a given
3. able to deal with data modeling issues, both in the relational and in the NoSQL frameworks
4. able to use, at least at an elementary level, both SQL and NoSQL systems to manage a given set of data

**METHODOLOGY**

The module will be laboratory-centered. Specific data management problems will be proposed to students, organized in groups and suitably tutored, asking them to organize data and to access them programmatically

**EXAM**

Small project with oral examination

**CONTENTS**

1. Relational modeling of data and relational databases
2. Managing our data with a relational DBMS
3. The NoSQL approach to data management
4. Types of NoSQL systems and their characteristics
5. Managing our data with a NoSQL system
6. Introduction to GeoDatabases and Spatial Databases

**TEACHING MATERIAL**

Elmasri-Navathe – “Fundamentals of Database System” –Pearson- 7th ed.

Slides

Mysql Reference manual

Mongodb manual

**SUGGESTED READING**

Chapter 1- 2- 3 of the previous book

**ADDITIONAL SUGGESTED TEXTBOOKS**

Atzeni,Ceri,Fraternali,Paraboschi,Torlone *Basi di dati -* ed. McGraw-Hill 4nd edition