



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Architetture Dati

2021-1-F1801Q159

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#### Aims

The course is provided in Italian.

First of all the concept of data life cycle and of data base management system is discussed in traditional environments and information systems, and the so called ACID properties are examined,

The evolution of data base management systems from centralized architectures to distributed and federated architectures is examined in detail, providing also general concepts of data architecture design.

As to data governance, two relevant phases are examined in more depth, data linkage (also called object identification ) and fusion, and data quality assessment, that are experimented using tools.

The recent evolution of management systems from "small data" to big data is investigated, with specific reference to the most important phenomena, related to the increase in the volume of data and the increase in the heterogeneity of data types, from relational data bases to document bases, linked open data and graph data.

#### Contents

Data life cycle, management and analysis phases

Traditional Data Base Management systems (DBMS)

Evolution of DBMSs from centralized to distributed, replicated, federated.

Data governance

NoSQL database models and architecture

Big data principles and architectures

## **Detailed program**

Traditional Data Base Management Systems (DBMS)

- Centralized data base management systems (DBMS)
- Distributed DBMSs
- Replicated systems

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- Virtual data integration systems

Data governance

- Record linkage and fusion

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Evolution of data management systems from small data to big data

- NoSql Architectures and models
- Key value databases
- Document based DBMSs
- Graph Databases
- Linked Open Data
- Big Data

## **Prerequisites**

Knowledge on data models, relational model and Entity Relationship model, and database design methodologies is useful, but non mandatory

## **Teaching form**

Lectures and exercises in Italian, company presentation

During the COVID-19 emergency the course will be delivered remotely asynchronously. Some videoconferencing events will also be organized as self-assessment tests, they will not be considered for the final evaluation

## **Textbook and teaching resource**

slides will be published on the Elearning platform

Text book

Next Generation Databases: NoSQL, NewSQL, and Big Data

by Guy Harrison Publisher: Apress

Release Date: January 2016

ISBN 9781484213292

## **Semester**

first semester

## **Assessment method**

Written examination related to the topics of the course and exercises. Teacher could ask and oral exam

Alternative assessment method: Project work, individual or in group related to the technologies shown during the course

## **Office hours**

Thursday from 10 to 11 building U14 room 2017 prof Maurino \_\_\_\_\_

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