UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Introduction To Databases (blended)

2122-2-E4101B040

Learning objectives

The course is an introduction to the field of relational databases. The relational model and the SQL language will be illustrated. It will be taught how queries can be used to calculate synthetic indicators starting from information stored in relational databases. Database design methodologies will be illustrated. The differences between structured, semi-structured, and unstructured data and the problems associated with their management will be introduced. The course will also give an overview of data quality related topics.

Contents

- Introduction to relational databases
- The Client / Server paradigm
- Relational algebra and SQL language
- Analysis and extraction of information from existing databases
- Conceptual, logical, and physical design of databases
- Transaction support
- Data Quality
- Structured, semi-structured, unstructured data

The teacher might make changes to the aforementioned contents during the teaching activities. Any changes will be promptly indicated on this website.

Detailed program

- The Relational paradigm
- Primary Key and Foreign Key
- Client / Server paradigm
- Centralized data management
- Relational algebra (projection, selection, cartesian product, join)
- Boolean algebra
- SQL Language (Data Definition and Data Manipulation Language)
    - Anatomy of an SQL query
    - Group By clause and aggregation operators
    - Nested Queries
    - Calculation of indicators through SQL query
- Information Systems Lifecycle and Database Design
- Conceptual design
- Logical design
- Physical design
- ER Model
- Normalization
- Transactions and ACID properties
- Indexes
- Structured, semi-structured, unstructured data
- Web scraping

Prerequisites

None. It is highly suggested to have previously attended the "Informatica" and "Laboratorio di Informatica" courses and passed the related examinations.

Teaching methods

- Lessons
- Lab exercises
- Final lab activities and a simulation of the final test

Assessment methods

Textbooks and Reading Materials

Semester

Teaching language

Italian