Database systems

This course

```
Raw data
   ↓
Data collection
   ↓
Data storage
   ↓
Data analysis for
knowledge mining
   ↓
Useful Knowledge
```
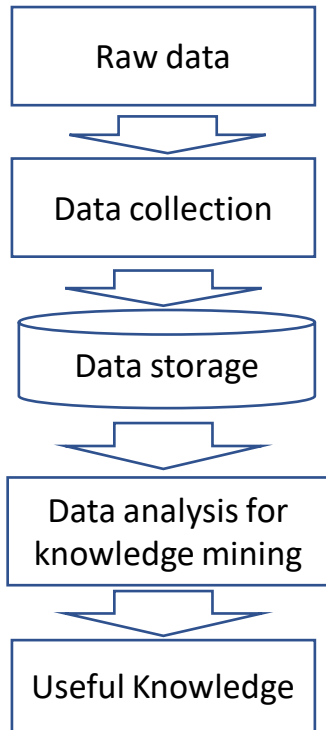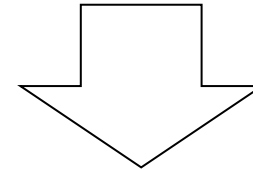
- How can data be stored and managed?
- How can data can modeled?
- How can data be analysed to extract useful knowledge?

⬇

Database systems

- Methodologies for the design, querying, and management of databases

- Introduction to business intelligence and the creation of interactive dashboards for data reporting.

Course contents at a glance

- Characteristics of a database management system

- Relational data model

- SQL language: statements to query, modify and define the database

- Design of a relational database
  - Conceptual data model (Entity-Relationship), methodology for the conceptual and logical design

- Introduction to development of web-based applications for database querying and management

- Introduction to Business intelligence: data modelling, data preparation, data analyses with an interactive dashboards

Course structure

- The course includes
    - lessons
    - classroom exercises
    - laboratories

- Laboratory sessions propose experimental activities on the most widespread commercial and open-source products

Reading material, Announcements

- Reading material
  - Slides used in classes
  - Texts and solutions of the proposed exercises
  - Texts and materials useful for laboratory exercises/practices
  - Available on the course website ([course website](#))

- Announcements
  - Course website on the Didactic Portal

Assessment and grading criteria

- Exam
  - Written test (mandatory)
    - A set of design exercises
    - A set of theory questions and exercises
  - Homework (project) on the main topics of the lectures (optional)
  - Exam policy on the didactic portal ([link](#))
- Further details about exam structure and grading criteria are available on the didactic portal

Homework

- Homework exercises to be delivered during the course

- Points from Homework exercises are added to the grade on the written test (if grade on the written test is >= 18)

- Delivery of Homework exercises is optional

- Maximum 3 points

- Points from the Homework exercises will be valid until the exam session of February 2025 (included)

Reference books

- Database Systems - Concepts, Languages and Architectures Paolo Atzeni, Stefano Ceri, Stefano Paraboschi and Riccardo Torlone McGraw-Hill, ISBN 0-07-709500-6
  - A free PDF file is available here http://dbbook.dia.uniroma3.it/
- Matteo Golfarelli, Stefano Rizzi. Data Warehouse Design: Modern Principles and Methodologies, McGraw-Hill Education, 2009