Universidad Zaragoza

Academic Year/course: 2024/25

69722 - Information systems in medicine

Syllabus Information

Academic year: 2024/25
Subject: 69722 - Information systems in medicine
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 633 - Master's Degree in Biomedical Engineering
ECTS: 3.0
Year: 1
Semester: Second semester
Subject type: Optional
Module:

1. General information

The objective of this subject is to familiarize students with the techniques and technologies used for digital information management. Emphasis will be placed on the basic principles of relational database design, as well as some more advanced aspects of medical information systems.

2. Learning results

- To know the basic concepts of databases and information systems.
- To be able to perform the conceptual design and the corresponding relational databases for simple information management problems.
- To be able to perform simple queries to a relational database using the standard SQL language.
- To know the current trends in information management, beyond the use of databases, in biomedical environments, and the relevant role that ontologies tend to play in them.

3. Syllabus

- Introduction to information systems.
  - Concept and function of information systems
  - Structure and characterization of an information system
- Databases
  - Basic concepts: abstraction levels, data models and DB Management Systems.
  - Extended entity-relationship model
  - Introduction to SQL
  - Relational databases in biomedicine
  - Other database models: NoSQL databases
- Interoperability of information systems
  - ETL processes and integration architectures
  - Introduction to coding standards and health information reference models
- Information retrieval
  - Data and text mining
  - Data analysis and visualization
- Legal and regulatory aspects
  - Security and privacy
  - Legislation on personal data management and use of health care data

4. Academic activities

- Participative master class sessions (18 hours): Different concepts related to the topics to be covered will be introduced and students will be asked to participate and discuss the technical, ethical and moral aspects involved.
- Problem sessions, laboratory practices and directed work (12 hours): we will work on different technologies and examples of information systems in production. In addition, during the last sessions of the subject, students will present the work they have done.
- Study and personal work: 40 hours.
- Assessment tests (5 hours)

5. Assessment system

The subject will be assessed by the continuous assessment system by means of the following activities:

-Individual written test of short questions and problems related to the program taught in the subject (30% of the grade, minimum of 5 out of 10).

-Learning portfolio of the laboratory practices developed, along with the documentation required in each of them, and completion of an individual final test on the work developed (40% of the grade).

-Report and oral presentation of a documentation and analysis paper (30% of the grade).

In order to pass the subject, it is essential to obtain a grade in the written test higher than or equal to 5 points out of 10. In case of failing the written test, the overall grade will be the minimum between 4 and the weighted sum, with the percentages shown above, of the results of each project or test. The subject is passed with an overall grade of 5 out of 10.

There will be a global test in each of the dates and times established in the subject. The evaluation criteria will be the same in both calls (ordinary and extraordinary).

6. Sustainable Development Goals

9 - Industry, Innovation and Infrastructure
12 - Responsible Production and Consumption
17 - Partnerships for the Goals