Universidad Zaragoza

Academic Year/course: 2022/23

69722 - Information systems in medicine

Syllabus Information

Academic Year: 2022/23
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

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, autonomous work, exercises, presentations, readings, assignments, and tutorials.

4.2. Learning tasks

The course includes the following learning tasks:

- A01 Lectures (around 18 hours). The professor explains the main contents of the course and their application to problem-solving, with the participation of students.
- A02 Computer lab sessions (around 8 hours). The goal is that students acquire basic knowledge of the standard query language SQL to interact with DBMS and the use of simple development tools.
- A03 Assignment and oral presentations (around 4 hours). Students should develop several works where they apply the knowledge acquired, in particular the work will be about a current information management problem related to bioengineering. Moreover, they will also do a presentation about the work in class.
- A04 Reading of papers. Reading and oral presentation of one or more research papers related to some of the course topics.
- A06 Tutorials. Teacher's office hours where students can review and discuss the materials and topics presented in class.
- A08 Assessment. A set of written theoretical-practical tests and submission of reports and assignments used to evaluate the progress of the students. More details are provided in the Assessment Section.

4.3. Syllabus

The course will address the following topics:

- Introduction to Information Systems:
    - Concepts and functions of Information Systems.
    - Architecture and features of Information Systems
- DataBases (DB) and Database Management System (DBMS)
    - Concept of database. Abstraction levels and data models.
    - Concept of Data Management System (DBMS)
    - Conceptual Level of a data base. Entity-Relationship model
    - Normalization
    - Introduction to SQL
    - Use cases about relational data bases in bioengineering
- Other database models. NoSQL DB
    - Types of NoSQL DB
    - Use cases about NoSQL BD in bioengineering
    - Interoperability of information systems
    - Syntactic and semantic interoperability in health information systems
    - ETL Process (extraction, transformation and load)
    - Integration architectures
    - Tools for the interoperability of information systems
    - Introduction to health information coding standards
    - Reference models in health information systems
- Information retrieval.
    - Text Mining
    - Data Mining
    - Advanced queries
    - Analysis and visualization of data
- Legal topics and regulatory aspects:
    - Security and privacy
    - Legislation on personal data management
    - The use of health data in research and in the clinical healthcare setting

4.4. Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the website of the master (http://www.masterib.es) and of the Escuela de Ingeniería y Arquitectura (https://eina.unizar.es).

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=69322