

## 69322 - Information systems in medicine

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 69322 - Information systems in medicine

**Faculty / School:** 110 -

**Degree:** 547 - Master's in Biomedical Engineering

**ECTS:** 3.0

**Year:** 1

**Semester:** Second semester

**Subject Type:** Optional

**Module:** ---

### 1.General information

#### 1.1.Aims of the course

#### 1.2.Context and importance of this course in the degree

#### 1.3.Recommendations to take this course

### 2.Learning goals

#### 2.1.Competences

#### 2.2.Learning goals

#### 2.3.Importance of learning goals

### 3.Assessment (1st and 2nd call)

#### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

### 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** (18 hours). The professor explains the main contents of the course and their application to problem-solving, with the participation of students. This activity will take place in the classroom.
- **A02 Computer lab sessions** (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. It will take place in computer labs.
- **A03 Assignment.** Students should design and implement the basic aspects of a database (conceptual design, relational design, and implementation in SQL of a minimum set of queries over that database) corresponding to an easy problem of information management related to bioengineering.
- **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:

1. Databases and Database Management Systems
  1. Concept of database. Abstraction levels and data models.
  2. The Database Management System (DBMS).
2. Conceptual level of a database: the entity-relationship model
  1. Design of databases using the extended entity-relationship model.
  2. Application to the design of biomedical databases.
3. The relational approach
  1. Design of databases using the relational model.
  2. Relational languages: SQL.
  3. Normalization.
4. Advanced concepts of databases
5. Medical ontologies
  1. Knowledge representation.
  2. Ontology description languages. Reasoners.
  3. Examples of ontologies.
  4. Integration of distributed data sources.
  5. Data warehouses and data mining.

### 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://biblos.unizar.es/br/br\\_citas.php?codigo=69322&year=2019](http://biblos.unizar.es/br/br_citas.php?codigo=69322&year=2019)