Universidad Zaragoza

Academic Year/course: 2024/25

39845 - Databases II

Syllabus Information

Academic year: 2024/25
Subject: 39845 - Databases II
Faculty / School: 326 - Escuela Universitaria Politécnica de Teruel
Degree: 634 - Joint Programme in Computer Engineering - Business Administration
ECTS: 6.0
Year: 4
Semester: Second semester
Subject type: Optional
Module:

1. General information

The subject focuses on advanced aspects of databases, including their design, administration and management in distributed environments, developing the necessary skills for the design, creation and management of databases of medium size, as well as the choice of the appropriate technology. Given that databases are key in the information systems used by organizations to manage the information necessary for their operation, and also to address SDG challenges, it is considered that the acquisition of the learning results of the subject provides training and competence to the student to contribute to some extent to the achievement of the Sustainable Development Goals in a cross-cutting manner.

Recommendations to take the subject: to have taken "Databases" (fourth quarter); it is convenient to have knowledge of object oriented programming.

2. Learning results

- Be able to adequately design medium-size databases and implement them in a commercial Database Management System.
- Be able to select among different Database Management Systems, evaluating the advantages and disadvantages of each one for a given organization and information needs.
- Be able to administer and operate a database: manage its users, set appropriate access permissions, optimize its operation, provide access programs, etc.
- Be able to propose appropriate solutions for the implementation of database systems in a distributed environment.

3. Syllabus

1. Database Design:
    - Post-relational data models. Object-relational DBs.
    - Conceptual design, analysis of alternatives and their impact, practical examples.

2. Distributed Databases:
    - Motivation.
    - Architectures and design.
    - Integration and federation of different data sources.
    - Parallel DBs, DBs and Internet and mobile DBs.

3. Database Management Systems (DBMS):
    - Basic functions and architecture.
    - Main DBMSs and criteria for choosing a DBMS.
    - Advanced functionalities.
    - Examples (such as Oracle, PostgreSQL, NoSQL systems). Features, supported query language, other aspects (e.g., query optimization).

4. Administration and Exploitation of a Database:
    - Implementation and configuration of the main DBMSs.
    - Administrator roles.
    - Security and permissions management.

- Other aspects of administration.

4. Academic activities

Lectures: sessions with the teachers in which the subject matter will be explained: 30 hours.

Problems and cases: sessions to solve practical cases presented by the teacher: 15 hours.

Laboratory practices: 15 hours.

Study of the subject; class preparation; practical activities: 84 hours.

Assessment tests: 6 hours.

Estimated hours for each type of activity are indicated.

5. Assessment system

1. **Practical computer work (practices):** 50% of the final grade.
2. **Written test** with theoretical and practical assumptions: 50% of the final grade.

   In the continuous assessment, the delivery of assignments and their presentations will be made throughout the development of the subject on the dates set by the teaching staff. The final grade will be obtained as the weighted average of the different parts of the assessment, taking into account that it is necessary to obtain at least 5.0 points out of 10.0 in each of them. In case of not reaching this minimum in any of the parts, the final grade will be the minimum between 4.0 and the result of weighting with the percentages of each part.

Final global test:

It will include the written test. In addition, students who have not submitted the practices and/or assignments regularly on the established partial due dates (or whose submissions are deficient) must submit those practices and/or assignments as part of the overall final global test, and must also pass an additional related test consisting of the resolution of a problem. The final grade is calculated as in the continuous assessment.

6. Sustainable Development Goals

4 - Quality Education