



Universidad de Jaén

School of Engineering of Jaén

Database management and administration

2024-2025

Grado en Ingeniería Informática (E.P.S. Jaén)



CREA



Acceso Mayores 40

Guías docentes UJA

Horarios de tutorías

Llamamientos PAU

Movilidad (Coordinador)

P.O.D.

Solicitud bilingüismo

Syllabus 2024-25 - 13312016 - Database management and administration (Gestión y administración de bases de datos)

Caption

- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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DEGREE:

Grado en Ingeniería informática

FACULTY:

SCHOOL OF ENGINEERING OF JAÉN

ACADEMIC YEAR:

2024-25

COURSE:

Database management and administration

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Database management and administration

CODE: 13312016

ACADEMIC YEAR: 2024-25

LANGUAGE: English

LEVEL: 3

ECTS CREDITS: 6.0

YEAR: 3

SEMESTER: PC

2. LECTURER BASIC INFORMATION

NAME: MARTÍNEZ SANTIAGO, FERNANDO JAVIER

DEPARTMENT: U118 - INFORMÁTICA

FIELD OF STUDY: 570 - LENGUAJES Y SISTEMAS INFORMÁTICOS

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LANGUAGE: -

LEVEL: 3

3. CONTENT DESCRIPTION

THEORY

1. Database administration

1.1. The Database Administrator (DBA)

1.2. Functions of the DBA

1.3. Relational DBMS architecture

1.4. Tools for the administration

2. Database Security

2.1. Objectives and requirements

2.2. User identification

Privilege management

2.4. Allocation and Control of System Resources

2.5. SQL Security

2.6. Views

3. Transaction Management

3.1. Transaction Concept and Statuses

3.2. Storage operations

Log-based crash recovery 3.4.

3.4. Drop recovery in commercial DBMSs

3.5. Backup copies

4. Database optimization

4.1 Physical data model

4.2 Query optimization

5. Non-relational databases

5.1 Document-based databases

5.2 Key-value based databases

5.3 Column-based databases

5.4. Hypergraph and knowledge graph based databases 5.5.

5.5 Vector-based databases

5.5 New trends

5.6 How to choose a non-relational database?

PRACTICES**1. Stored procedures**

1.1. Definition of blocks in PL/SQL

1.2. Declaration of constants and variables

1.3. Control structures

1.4. Declaration and use of cursors

1.5. Use of SELECT within a block

1.6. Declaration and use of stored procedures and functions

2. Triggers

2.1. Declaration and use of triggers

2.2. Types of Triggers

2.3. The Mutant Table Problem

3. DB Optimization

3.1 Physical data model

3.2 Query optimization

4. Non-relational databases

4.1. Schema of a non-relational database

4.2. Population of a non-relational database

4.3. Use of a non-relational

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

1. Lectures (theoretical-Lectures) (large group) Description: Presentation in the classroom of concepts of matter using participatory methodology expository lectures and media. Evaluation and review of acquired skills. Purpose: To transmit the contents of the subject motivating students to reflection, facilitating the discovery of relationships between different concepts and training them critical thinking

2. Practical activities (laboratory practicals) (small group) Description: Activities through which aims to show the students how to act on the application of the knowledge acquired Purpose: Development in students of instrumental skills The matter.

3. Seminars (small group) Description: organizational mode of teaching and learning processes which deal in depth with a related subject matter. It incorporates inquiry-based activities, discussion, reflection and exchange. Purpose: Development in students of cognitive and procedural skills of matter.

4. No-class individual activities (Studio and self-employment) Description: 1) Activities (guided and unguided) proposed by the teacher through which individually and delves into specific aspects of the subject enabling the student to move in acquisition of certain knowledge and procedures matter, 2) individualized study of the contents of the subject 3) evaluation activities (reports, surveys, etc) Purpose: To

promote the student's ability to self-regulate their learning, planning it, by designing, evaluating and adapting it to their particular conditions and interests.

5. No-class activities in group (Study and work in group) Description: Activities (guided and unguided) proposed by the teacher through which as a group and delves into specific aspects of the subject allowing students to move in acquisition of certain knowledge and procedures matter. Purpose: To encourage students in the generation and exchange of ideas, identification and analysis of different views on a topic, generalization or transfer of knowledge and critical assessment of it.

In theory classes the competences CB2R, CB3R, CB5R, CC12R and CC13R will be worked on.

In the practical classes and in group tutorials, the competences CC12R and CC13R will be worked on.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

-Theory exam: (5 points). Necessary requirement to pass the course: to achieve a minimum grade of 2 out of 5 in the theory exam.

- Practical exam (3.5 points). Prerequisite to pass the course: a minimum grade of 1.4 out of 3.5 in the practical exam.

- Delivery of the practice script: 1.5 points.

In case a student does not reach the minimum required in theory (2) and/or practical (1.4), the final grade will be equal to the lowest grade achieved considering the grades of the theory exam and the practical exam.

The following aspects will be considered for the benefit of the student, up to a maximum of two additional points on the grade obtained in the sum of the theory and practical exams

Participation in the theory classes

Completion of the exercises at the end of each topic.

Completion of practice scripts

Completion of some work related to the subject and its presentation in class.

The grading system will be expressed by numerical grade in accordance with the provisions of art. 5 of R. D 1125/2003, of September 5, which establishes the European credit system and the grading system in university degrees of an official nature and valid in the national territory.

The evaluation of the subject will be global, allowing the student to be evaluated without the need for a single test. The activities carried out both in the theoretical and practical classes will be continuously assessed.

The learning outcomes 13 and the competences CB2R, CB3R, CB5R and CC12R, are evaluated by means of the aspects S1, S2, S3 and S4. However, both the instruments and the criteria are different. In aspects S3 and S4, the practical development, its defense and exposition are evaluated, and in evaluation aspects S1 and S2, theoretical knowledge is assessed.

6. BOOKLIST ([Access the bibliography in the Library catalog](#))

MAIN BOOKLIST:

- Fundamentals of database systems. Edition: 6th ed. Author: Elmasri, Ramez. Publisher: Harlow : Pearson, cop. 2014 ([Library](#))
- Database: system concepts. Edition: 6th ed.. Author: Silberschatz, Abraham. Publisher: New York : McGraw-Hill, c2011 ([Library](#))
- NoSQL for Mere Mortals®. Edition: 1st edition. Author: Sullivan, Dan, author.. Publisher: Addison-Wesley Professional ([Library](#))

7. SUSTAINABLE DEVELOPMENT GOALS

Industria, innovación e infraestructura

DETAILED INFORMATION

- Develop secure web and cloud applications that improve business efficiency and productivity.
- Promote innovation in cloud security solutions that address enterprise cybersecurity issues.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

For the section of the scenario semi-presential or mixed:

Activities that cannot be carried out in person will be carried out in a semi-presential format with rotating assistance and the use of video-conference systems, provided that the capacity and infrastructure of the space assigned for teaching the subject allow it. The Centre may vary the percentage of attendance depending on the number of students and the capacity of the classroom/laboratory. In case of less than 100% attendance, there will be a periodic rotation of students as determined by the Center.

It is expressly forbidden to record by any means the face-to-face or non face-to-face synchronous activities.

9. VIRTUAL TEACHING SCENARIO

Activities that cannot be carried out in person will be carried out by means of synchronous and/or asynchronous activities carried out through the virtual teaching platform.

It is expressly forbidden to record by any means the face-to-face or non face-to-face synchronous activities.

The system and assessment instruments will be the same as for the face-to-face mode, replacing the face-to-face tests with similar tests developed through the use of the online teaching platform, provided that the identity of the student is guaranteed.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es

