

SUBJECT TEACHING GUIDE

G657 - Databases

Degree in Computer Systems Engineering

Degree in Mathematics

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Computer Systems Engineering Degree in Mathematics			Type and Year	Compulsory. Year 2 Optional. Year 4
Faculty	Faculty of Sciences				
Discipline	Subject Area: Software and Information Systems Engineering Mention in Computer Science Compulsory Module				
Course unit title and code	G657 - Databases				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	https://moodle.unican.es/course/view.php?id=17944				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA
Name of lecturer	ALFONSO DE LA VEGA RUIZ
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Other lecturers	DIEGO GARCIA SAIZ

3.1 LEARNING OUTCOMES
- Learn the terminology of relational data bases
- Understand relational data bases and programme its creation, update and query
- Use tools that help us to create and manage relational data bases
- Develop data base applications

4. OBJECTIVES

Learn the terminology of data bases.

Understand the concept of physical and logical data independence.

Understand the concept of transaction and its implications.

Know the architecture of a relational database management system and understand the need and function of each of its elements.

Learn the relational data model and SQL.

Know the main functions and tasks of the database administrator to ensure the confidentiality, security, availability and integrity of information.

Study the essential elements to build data base applications and the current technologies for their implementation.

Introduction to other data models: multidimensional, object-relational, documental, key-value, etc.

6. SUBJECT PROGRAM

CONTENTS	
1	INTRODUCTION TO DATABASES Concept of a database. From files to databases. Levels of abstraction. Types of databases Introduction to relational databases and the SQL Standard Language
2	RELATIONAL DATA MODEL Introduction. Main features of the relational model. Design and implementation of relational databases.
3	SQL LANGUAGE Introduction. Standards. Data definition language. Data manipulation language. Transactions. Performance. Programmatic elements.
4	SOFTWARE ENGINEERING AND DATABASES Management of data in an application. Architectures for the implementation of applications with database access. Programmatic access to databases
5	SECURITY IN DATABASES Access control. Security at data level. Backup and restoration of data.
6	NON-RELATIONAL DATABASES Semi-structured data. Introduction to NoSQL databases. Document data stores.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam. T1 and T2	Written exam	No	Yes	30,00
Team project: design and development of a database and a Java/Python application	Work	No	No	25,00
Written exam: T3 to T6	Written exam	Yes	No	15,00
SQL final exam in lab	Laboratory evaluation	No	Yes	30,00
TOTAL				100,00
Observations				
<p>The final grade will be the weighted sum of the grades obtained in the evaluation activities. If the student does not obtain the minimum grade required to pass an evaluation test, the overall grade for the course will be the lowest value between 4.9 and the weighted average of all the evaluation tests.</p> <p>In the extraordinary period the evaluation will be the maximum between these two options:</p> <p>Option 1:</p> <ul style="list-style-type: none"> - Written exam: 50%. - Laboratory exam: 50%. <p>Option 2:</p> <ul style="list-style-type: none"> - Written exam: 37.5%. - Laboratory exam: 37.5% - Team project: 25% 				
Observations for part-time students				
<p>Part time students will be assessed according to:</p> <ul style="list-style-type: none"> - Written exam: 37.5% - Lab exam: 37.5% - Individual project: 25% 				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Elmasri, R., Navathe, S.B., Fundamentals of database systems. 7th edition (5ª en español). Pearson Education, 2017. Hay varias ediciones, vale cualquiera.

Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database system concepts, 6th edition, 2011. Hay varias ediciones, vale cualquiera.