SUBJECT TEACHING GUIDE

G657 - Databases

First Degree in Computer Systems Engineering
Degree in Mathematics

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	First 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)	
Knowledge Field	Computer and systems engineering Mathematics and statistics				
Web	https://moodle.unican.es/login/index.php				
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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Office	Facultad de Ciencias. Planta: + 1. DESPACHO PROFESORES (1073)
Other lecturers	DANIEL POSTIGO DIAZ

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. Programmatic access to databases. Architectures for the implementation of applications with database access. Object-relational mapping.
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.	Reassessment	%
Written exam. T1 and T2 (mininum grade: 5)	Written exam	No	Yes	40,00
Lab exam (minimum grade: 5)	Laboratory evaluation	No	Yes	40,00
Written exam. T3 to T6	Written exam	Yes	No	20,00
TOTAL				100,00

Observations
The final grade will be the weighted sum of the scores obtained in the planned evaluation activities. If the student does not achieve the minimum required grade to pass any of the tests, the overall grade for the course will be the lower value between 4.9 and the weighted average of all tests. During the ordinary exam period, students may retake those partial tests carried out during the course in which they did not reach the minimum required grade. During the extraordinary period, grades obtained during the ordinary assessment are not retained. A single exam covering all course content will be held, with the following parts and weights: * Written exam: 50% * Laboratory exam: 50%
Observations for part-time students
Same evaluation criteria apply as for full-time students, both during the ordinary and the extraordinary periods.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Abraham Silberschatz, Henry F. Korth, S. Sudarshan. Database system concepts, 7th edition, 2019. (Libro principal, las ediciones más nuevas están en inglés, pero vale cualquiera)
Elmasri, R., Navathe, S.B.. Fundamentals of database systems. 7th edition (5ª en español). Pearson Education, 2017. (Libro de referencia alternativo en caso de que no encontréis el otro, vale igual)