

SUBJECT TEACHING GUIDE

G657 - Databases

Degree in Computer Systems Engineering
Degree in Mathematics

Academic year 2022-2023

| 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=12128 | | | | |
| Language of instruction | Spanish | English Friendly | Yes | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|--|
| Department | DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA | | | | |
| Name of lecturer | MARTA ELENA ZORRILLA PANTALEON | | | | |
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| Other lecturers | DIEGO GARCIA SAIZ ALFONSO DE LA VEGA RUIZ RICARDO DINTEN HERRERO | | | | |

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. COURSE ORGANIZATION

| CONTENTS | |
|----------|--|
| 1 | Introduction to data bases. From files to data bases. Levels of abstraction, Relational model. SQL. Transaction. DBMS architecture. Type of users |
| 2 | Relational data model. Basic elements. Relational schemas. ANSI-SPARC architecture. Phases of data base design: conceptual, logical and physical models. CASE tools |
| 3 | SQL language. Data types. Data definition language. Data manipulation language. Views. Index. Transactions. PSM. Triggers |
| 4 | Administration of data bases. Functions of data administrator and data base administrator. Issues related with security, encryption, availability and integrity of information |
| 5 | Design and development of data base applications. Languages and tools. Reports and forms. Architectures. Technologies |
| 6 | Other data models: object-relational model, multidimensional model, semi-structured model, etc. |

7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|-----------------------|-------------|-----------|---------------|
| Written exam. Relational design. | Written exam | No | Yes | 10,00 |
| Written exam. SQL | Written exam | No | Yes | 15,00 |
| Team project: design and development of a Java data base application | Work | No | Yes | 15,00 |
| Final exam: questions and exercises | Written exam | Yes | Yes | 30,00 |
| SQL final exam in lab | Laboratory evaluation | No | Yes | 30,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| <p>Final mark will be computed as weighted-sum of all learning activities. Qualification can be increased up to 1 point by performing activities during the semester, as long as the final mark is higher than 4,5.</p> <p>The evaluation in september will be: - Written exam: 55% - Lab exam: 30% - Team project: 15%</p> | | | | |
| Observations for part-time students | | | | |
| <p>Part time students will be assessed according to: - Written exam: 55% - Lab exam: 30% - Team project: 15%</p> <p>Qualification can be increased up to 1 points by performing activities during the semester, as long as the final mark is higher than 4,5</p> | | | | |

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Elmasri, R., Navathe, S.B., Fundamentals of database systems. 7th edition. Pearson Education, 2017.

Silberschatz, A., Korth, H.F., Sudarshan, S., Database system concepts, 6th edition, New York : McGraw-Hill, 2011