



GENERAL INFORMATION

Data of the subject	
Subject name	Bases de Datos
Subject code	DCIA-IMAT-222
Mainprogram	N/A [GiMAT 26]
Involved programs	Grado en Ingeniería Matemática e Inteligencia Artificial [Second year]
Credits	6,0 ECTS
Type	Obligatoria (Grado)
Department	Department of Telematics and Computer Sciences

Teacher Information	
Teacher	
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DESCRIPTION OF THE SUBJECT

Contextualization of the subject
Prerequisites
Python programming
Basic computer skills.
Algebra (set theory)



Course contents

Contents
Introduction to databases
Introduction to databases
Structured and unstructured data.
Information acquisition and retrieval.
Introduction to databases. Types of databases.
Data architectures: data lakes, data warehouses, and data marts.
Relational databases
Relational databases.
Relational databases.
Database design and normalization.
Relational algebra.
SQL databases
SQL databases
SQL query language.
Query optimization and benchmarking.
NoSQL databases
NoSQL databases
Introduction to NoSQL databases.
Scalability.
Document-oriented databases. MongoDB.
Graph databases.

EVALUATION AND CRITERIA

The use of AI to produce full assignments or substantial parts thereof, without proper citation of the source or tool used, or without explicit permission in the assignment instructions, will be considered plagiarism and therefore subject to the University's General Regulations.



Syllabus
2026 - 2027

Evaluation activities	Evaluation criteria	Weight
Midterm Exam (20%) Final Exam (50%)	Midterm Exam (20%): an exam that may include both practical and theoretical exercises designed to assess understanding of the course concepts related to Block 1 (Introduction to Databases), Block 2 (Relational Databases), and, whatever time allows of Block 3 (SQL). Final Exam (50%): an exam that may include both practical and theoretical exercises covering the midterm exam syllabus, expanded to include the rest of the course material. NO AI: The assessment must be completed entirely without AI assistance in a controlled environment, ensuring that students rely solely on their existing knowledge, understanding, and skills. You must not use AI at any point during the assessment. You must demonstrate your basic skills and knowledge. Any student who uses AI will receive a Fail (0) for the corresponding exam, and disciplinary proceedings will be initiated in accordance with the University's General Regulations.	70 %



Syllabus
2026 - 2027

Individual or Group Assignment/Project/Case Study (15%):	Individual or Group Assignment/Project/Case Study (15%): A project that will integrate the use of the various database management systems explored during the course into a complete application. In addition to functionality, the project will be evaluated on the design used and the application of the course syllabus. AI COLLABORATION (free URLs only): AI may be used to help complete the task, including idea generation, writing, feedback, and assessment. Students must critically evaluate and modify the results suggested by AI, demonstrating their understanding. You may use AI to perform specific tasks, such as drafting texts and refining and evaluating your work. You must critically evaluate and modify any AI-generated content that you use. In all cases, content generated with the assistance of AI must be critically evaluated by the student. The final result must, at all times, be the student's own work. The inappropriate use of AI tools may affect the overall assessment of the submitted work. Furthermore, the teaching staff reserve the right to question and assess students on specific aspects of their work in order to verify their understanding; the outcome of these consultations may also affect the overall assessment of the corresponding work. Students must clearly document in their submissions the specific tasks for which they have used AI tools. This does not exempt students from responsibility for the submitted content or from the possibility of being questioned about it.	15 %
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Syllabus 2026 - 2027

Practical Laboratory Work and Practical Sessions Involving the Use of Software (15%):	Practical Laboratory Work and Practical Sessions Involving the Use of Software (15%): Practical sessions that will include query and coding exercises so that students can apply the knowledge acquired in the theory classes. In addition to functionality and the results obtained, the assessment will evaluate the coding style used in the practical sessions and the quality of the reports required. AI COLLABORATION (free URLs only): AI may be used to help complete the task, including idea generation, writing, feedback, and assessment. Students must critically evaluate and modify the results suggested by AI, demonstrating their understanding. You may use AI to perform specific tasks, such as drafting texts and refining and evaluating your work. You must critically evaluate and modify any AI-generated content that you use. In all cases, content generated with the assistance of AI must be critically evaluated by the student. The final result must, at all times, be the student's own work. The inappropriate use of AI tools may affect the overall assessment of the submitted work. Furthermore, the teaching staff reserve the right to question and assess students on specific aspects of their work in order to verify their understanding; the outcome of these consultations may also affect the overall assessment of the corresponding work. Students must clearly document in their submissions the specific tasks for which they have used AI tools. This does not exempt students from responsibility for the submitted content or from the possibility of being questioned about it.	15 %
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Grading

The course grade will be calculated as follows:

- 50% for the final examination (EX_F)
- 20% for the midterm examination (INTER)
- 15% for the project (PROY)
- 15% for the practical assignments (PRACT)



Syllabus 2026 - 2027

The final grade for both the ordinary and extraordinary examination periods will be:

$$\text{FINAL_GRADE} = 0.15 \times \text{PRACT} + 0.15 \times \text{PROY} + \text{MAX}(0.7 \times \text{EX_F}, 0.2 \times \text{INTER} + 0.5 \times \text{EX_F})$$

In other words, the maximum will be selected between considering only the final examination (70% of the grade) and combining 20% of the midterm examination with 50% of the final examination. The grade obtained in the midterm examination will be retained for the extraordinary examination period of the same academic year. To pass the course in either examination period, all the following conditions must be met simultaneously:

FINAL_GRADE $\geq$ 5

- **EX_F $\geq$ 5.** If EX_F is $\geq$ 5 in the ordinary examination period, the final examination grade will be retained for the extraordinary examination period. Otherwise, the student must retake the examination during the extraordinary examination period.
- **PRACT $\geq$ 5.** If PRACT is $\geq$ 5 in the ordinary examination period, the practical assignment grade will be retained for the extraordinary examination period. Otherwise, the teaching staff will determine the activities required to make up the practical assignments, which may consist of repeating practical assignments, completing new activities, or a combination of both.
- **PROY $\geq$ 5.** If PROY is $\geq$ 5 in the ordinary examination period, the project grade will be retained for the extraordinary examination period. Otherwise, the student must complete the project recovery activity determined by the teaching staff.
- If any of these requirements is not met, the final grade for the examination period being assessed will be the lowest of the grades obtained in the final examination (EX_F), the practical assignments (PRACT), or the project (PROY).

WORK PLAN AND SCHEDULE

Activities	Date of realization	Delivery date
Reading and studying the content, notes, and code provided by the professors.	Before and after each class.	
Final project.	Approximately one month before the end of the course.	Before the final examinations.
Taking the examinations.	March, May, and June.	
Completion of the practical assignments.	Before, during, and after the practical sessions.	After it is published on Moodle (to be determined by the professors)
Development of Block 1: Introduction to databases.	At the beginning of the course (January).	Approximately one week.
Development of Block 2: Relational databases.	After Block 1.	Approximately one to two weeks.
Development of Block 3: SQL databases.	After Block 2.	Approximately three to four weeks.
Development of Block 4: NoSQL databases.	After Block 3.	Approximately four to five weeks.



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BIBLIOGRAPHY AND RESOURCES

Basic References
Moodle (manuals, slides, and exercises provided by the lecturer).