COURSE DATA

DATA SUBJECT

Code: 46571
Name: Management and manipulation of information
Cycle: Master's Degree
ECTS Credits: 3
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
2262 - Master's Degree in Data Science	Escola Tècnica Superior d'Enginyeria	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
2262 - Master's Degree in Data Science	Management and manipulation of information	COMPULSORY

COORDINATION

CERVERON LLEO VICENTE

SUMMARY

This course covers different models and technologies for structuring, storing and retrieving data using database management systems, both the most widely used relational model and new models, generically NoSQL databases, developed for large scale data including unstructured data.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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To know and use the different models of data storage and database management systems using programming languages for the definition, query and handling of data.

DESCRIPTION OF CONTENTS

1. Database system concepts

Basic database system concepts.

2. Relational databases

The relational model. Relational database design.

3. SQL

Structured Query Language.

4. NoSQL databases

Large scale data. Unstructured data. Document databases. Column-oriented databases. Graph-oriented databases.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	8,00
Theoretical and practical classes	4,00
Laboratory	18,00
Total hours	**30,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	24,00
Preparation of lessons	0,00
Preparation for assessment activities	8,00
Resolution of case studies	13,00

Total hours	**45,00**

TEACHING METHODOLOGY

The classes will combine theoretical and practical components without distinguishing between sessions dedicated to theory and those dedicated to practice. All sessions will take place in a computer lab.

During the theoretical sessions, the content will be presented in an expository manner, with student participation in solving specific questions. The practical sessions will be synchronized with the theoretical ones, and learning will take place through the resolution of problems, exercises, and case studies, through which students will acquire competencies related to the various aspects of the subject.

EVALUATION

The educational evaluation of knowledge and skills achieved by the students will mainly be made continuously throughout the course, and will consist in the following blocks of evaluation:

1. Exercises and work submitted during the course: 70% of the final grade.

2. Final exam: 30% of the final grade (being necessary a minimum of 4).

In case of a second chance, the two blocks are maintained with their weights; a new examination will be done and grades obtained in block 1 will be retained, although delivery of the exercises and works will be allowed to raise the score of that part.

REFERENCES

- Fundamentos de bases de datos Abraham Silberschatz, Henry F. Korth, S. Sudarshan Ed. McGraw-Hill
- Sistemas de gestión de bases de datos Raghu Ramakrishnan, Johannes Gehrke Ed. McGraw-Hill
- Sistemas de Bases de Datos Ramez A. Elmasri, Shamkant B. Navathe Pearson Educación.
- Getting Started with SQL Thomas Nield O'Reilly Media
- NoSQL Databases Christof Strauch Stuttgart Media University
- Cassandra Tutorials Point

- MongoDB Succinctly Agus Kurniawan Syncfusion