COURSE DATA

DATA SUBJECT

Code: 36523
Name: Data Modelling
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1332 - Degree in Business Intelligence and Analytics	Facultat d'Economia	2	Second quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1332 - Degree in Business Intelligence and Analytics	Tecnología y Programación	COMPULSORY

COORDINATION

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SUMMARY

The course "Data Modelling" is taught during the second semester of the second year. It deals with different subjects: data storage management, storage and retrieval algorithms, and efficient retrieval and update of data.

In this course, databases are presented as the best way to organize factual data in a computer, in front of the use of data files. The main characteristics of databases, theoretical foundations and the data representation models will be described. The architecture of the Database Management Systems will also be introduced.

Particularly, the course will focus on the relational data model, which is the widest used model in commercial implementations of DBMS (Oracle, IBM, Microsoft, ¿). The students will learn to use the Structured Query Language (SQL) as the basic tool to work with data in a relational database. They will also learn to design and implement a database through a well defined methodology: conceptual design, Entity/Relationship diagrams, logical and physical data models, and normalization.

Finally, the course will deal with the construction of software applications that interact with databases.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Other requirements
It is advisable to have taken the Programming and Fundamental Algorithms course prior to taking this course.

COMPETENCES / LEARNING OUTCOMES

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Acquire basic training that can be used to learn new methods and technologies and to adapt to new situations in academic and professional areas.

Be able to use ICT, both in academia and in professional practice.

Know the different types of data.

Reorganise and restructure variables and databases.

Students must be able to communicate information, ideas, problems and solutions to both expert and lay audiences.

Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.

DESCRIPTION OF CONTENTS

1. Introduction

- Information systems
- File systems vs database management systems Databases as part as information systems
- Basic conceptos of databases

2. The Entity/Relationship model

- A brief history
- Entities and atributes Relationships Restrictions Aggregation
- The extended E/R model

3. The relational model

- Relational algebra
- Relational calculus

4. Query and data definition languages

- Introduction to SQL
- Data definition language (DDL) Data manipulation language (DML) Introduction toPL/SQL.
- Laboratory sessions
  - 1,2 and 3 - View and manipulate a database (using the SQL language and as a data manipulation language).
  - 4 and 5 - Procedural languages ¿¿in the database (using the PL/SQL language)

5. Databases design

- Design methodologies Conceptual design
- Logical design. Normalization. Physical design
- Laboratory sessions
  - 6 and 7 - Creating databases (using the SQL language as a data definition language)

6. Accessing databases from software applications

- Multilayer applications architecture
- HTML and XML documents Embeded and dynamic SQL ODBC and JDBC
- Laboratory sessions

- 8 - Creating an application for extracting data from a database.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Computer classroom practice	30,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	25,00
Independent study and work	15,00
Preparation of lessons	35,00
Preparation for assessment activities	15,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

The learning process will be based on a combination of lectures, problem resolution sessions and practical activities (computer based laboratories). It will be complimented with the student personal work.

- **Lectures** will have a duration of 120 minutes, and different subjects will be taught, trying to promote the students participation.
- **Practical activities** will be based on problems resolution in the classroom. The duration of the sessions will be 120 minutes. Some of the planned activities are:
    - Problems resolution sessions
    - Seminars in regular classrooms and computer facilities
    - Debates, problems resolution and exercises previously worked by students
    - Individual tutorials
- **Laboratory sesions** will focus on the resolution of problems introduced in the regular lectures, with a duration of 120 minutes.
- **Individual personal work** for promoting the autonomous learning process, based on these aspects:
    - Preparation of lectures and reading of recommended texts
    - Problems resolution
    - Homework to be evaluated by the lecturer
    - Laboratory sessions preparation with anticipation
- **Teamwork**. Development of activities in small groups, inside and outside the classroom.

The virtual learning platform of the UVEG (Aula Virtual) will be used as a support to the teaching process and the student-lecturer communication. All the course material will be made available in this platform.

EVALUATION

Students will do 2 types of work:

1. Autonomous auto-learning work

2. Supervised work

1. Autonomous work for auto-learning will consist of activities done outside the regular schedule. The lecturer will guide this type of activities (readings, problems resolution, researching, etc.), but they will not be marked, although students could ask the lecturer for their revision in the individual tutorials.

2. Supervised work will consist of activities proposed by the lecturer, and they will be marked in order to evaluate the student evolution (**N_Activities**). The types of work are:

1. Individual activities

2. Group activites

3. Practical work with computers

The main characteristics of these activities are:

- They will be evaluated by the lecturer
- They will have a deadline or will be made in-person
- They are mandatory
- They are not recoverable in the second call

The student will have to pass one exam during the semester (**N_exam**). The final mark will be calculated using this formula:

Final Mark = 50% N_Exam + 50% N_Activities

It will be necessary to get, at least, 5 out of 10 at N_Exams for the formula to be applied. The minimun qualification of N_Activities will be 3,5 of 10 and for the formula to be applied and will be kept for the second call.

In any case, the evaluation of this subject will be done in compliance with the University Regulations in this regard, approved by the Governing Council on 30th May 2017 (ACGUV 108/2017)

This assessment starts from the premise that teaching at the University of Valencia is, by definition, on-campus lecture delivery method. In this sense, the student should be aware that attendance at both the theoretical and practical lectures is essential for proper monitoring of the contents of the course. The student must also consider the possibility to enroll part time (except in the case of students who register for the first time), when it is unable to attend all courses (60 credits). However, there is an exception for those students that justify it and request it. They have the possibility of being assessed without attending to all or part of the lectures. For these cases, students should proceed as follows:

- At the beginning of the course, student should inform to lecturer responsible for the course, the incidence that makes her/him unable to attend the class. This must be adequately justified in documentary form.
- The lectures in charge, in the light of this information, will decide the possibility of evaluation without full or partial assistance to the lectures.

Students who are in this situation must submit for evaluation all work required by the lecturer (not necessarily the same to those required for the course) and may also be called to defend them orally to the lecturer, and conduct a knowledge test. The weight of the final grade work will be 50% and the test the remaining 50% knowledge.

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