

Degree programme	Type	Course
Aeronautical Management	OB	2

Contact lecturer

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Prerequisites

From the 1st year of the degree:

1. Calculus
2. Fundamentals of Computing

Group languages

You can consult this information at the [end](#) of the document.

Statistics from previous years show that, in order to successfully follow the course, it is extremely important to have passed Fundamentals of Computing. Therefore, if Fundamentals of Computing has not been passed, we strongly recommend not enrolling in this course.

Objectives

The main objective of this course is to provide students with the basic concepts and tools required for the design, implementation, and use of relational databases, as a fundamental element for the efficient management of information in complex systems, including applications in the aeronautical sector.

For this reason, the course addresses data management from the perspective of data representation, storage, and querying, introducing the principles of the relational model and the techniques required to extract information from a database.

The general objectives are the following:

1. Understand the basic principles of databases and their importance in information management.
2. Design data models using the Entity-Relationship model based on the specifications of a real-world problem.
3. Transform a conceptual model into a relational model.
4. Understand the principles of the organisation and management of relational databases.
5. Perform queries of varying complexity on a database using the SQL language.
6. Analyse and evaluate the quality of a database design, taking into account aspects such as data consistency and information redundancy.

Through this course, students are expected to acquire the following skills:

1. Identify the information requirements of a problem and propose an appropriate structure for its representation using a database.
2. Design and implement a relational database based on a set of specifications.
3. Formulate SQL queries to obtain relevant information from databases of varying complexity.
4. Apply basic normalisation criteria to improve database design.
5. Interpret and manage information stored in relational database systems.

Learning outcomes

- CM01 (Work collaboratively in multidisciplinary teams to develop computer applications applied to aeronautical management.) Work collaboratively in multidisciplinary teams to develop computer applications applied to aeronautical management.
- CM02 (Critically examine the work carried out, identifying problems and proposing innovative and efficient solutions, taking into account the context of the aeronautical sector.) Critically examine the work carried out, identifying problems and proposing innovative and efficient solutions, taking into account the context of the aeronautical sector.
- KM04 (Describe the basic components of a database system, as well as the basic processes for storing, managing, and retrieving information in databases.) Describe the basic components of a database system, as well as the basic processes for storing, managing, and retrieving information in databases.
- SM08 (Design database components as part of low-complexity computer applications, which respond to information and management needs in the aeronautical sector.) Design database components as part of low-complexity computer applications, which respond to information and management needs in the aeronautical sector.

Contents

Topic 1. Introduction to Databases

1. Definitions. Components of a Database system.
2. Advantages and disadvantages of a Database system.

Topic 2. Data Models. Entity-Relationship Model and Relational Model

1. Introduction.
2. Data structures.
3. Integrity constraints.

Topic 3. Data Manipulation

1. SQL.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Monitoring and support in the assimilation of theoretical concepts	8	0.32	KM04, SM08

In-person sessions	50	2	KM04, SM08
Development of a database project	18	0.72	CM01, CM02, KM04, SM08
Preparation for the midterm exams	10	0.4	KM04, SM08
Support and guidance in problem solving	12	0.48	KM04, SM08
Preparation prior to in-person sessions	20	0.8	KM04, SM08
Problem solving	26	1.04	KM04, SM08

Since the background of the course is to support students in the abstraction process required for the design and use of databases, students' work is the central element of their learning process, supported and guided by the teaching staff. For this reason, face-to-face classes will be highly practical and will focus on consolidating the knowledge and skills that are the learning objectives of this course.

The general methodology of the course is divided into three phases:

Class preparation: the objective of this phase is for students to prepare the contents that will be addressed in the following session through various activities proposed by the teaching staff, such as watching videos, reading texts, or reviewing teaching materials.

Face-to-face session: the objective of this phase is to consolidate the concepts covered and place them within the context of the course. The teaching staff will ensure that students deepen their understanding of these concepts through practical exercises, such as data model design, modelling problem solving, and the formulation of queries on relational databases. Each student will complete the proposed activities and, where applicable, submit them at the end of the session.

Independent work: in order for students to gain autonomy in database design and SQL querying, they will complete part of the work outside the classroom through practical exercises and activities applying the concepts covered. This work will include the progressive development of a database project related to the contents of the course.

Database project: as part of the independent work required from students, a database project will be carried out to apply the knowledge acquired throughout the course. Students will progressively develop this project, from the analysis of information requirements and conceptual design to the implementation of the relational model and the creation of SQL queries. Some hours of the face-to-face sessions will be devoted to introducing the tasks to be carried out, monitoring the progress of the project, and addressing any questions that may arise.

The Virtual Campus platform (<http://cv.uab.cat>) will be the usual tool for exchanging information between teaching staff and students. All materials and information related to the development of the course will be published on this platform.

Note: 15 minutes of one class, within the schedule established by the centre/degree programme, will be

reserved for students to complete the evaluation surveys of teaching staff performance and of the course.

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
First Midterm Exam (EI)	25%	2	0.08	KM04, SM08
Database project (P)	25%	1	0.04	CM01, CM02, KM04, SM08
Assessment activities (AA)	25%	1	0.04	CM01, CM02, KM04, SM08
Second midterm exam (EI)	25%	2	0.08	KM04, SM08

This course does not offer a single-assessment system. Assessment is based on continuous evaluation.

The assessment of the course will be based on three types of activities, which will be carried out independently and whose weighted sum will determine the final grade:

1. Individual written examinations (EI)
2. Assessed activities (AA)
3. Database project (P)

1. Individual written examinations (EI):

This component consists of individual examinations in which the knowledge acquired throughout the course will be assessed, including concepts related to data modelling, relational database design, and SQL. The minimum grade required to pass this component is 5.

2. Assessed activities (AA):

This component will be carried out continuously throughout the course and will include practical activities proposed during face-to-face sessions and independent activities proposed to be completed outside the classroom. The final grade for this component will be obtained through the weighted sum of the requested learning evidence.

3. Database project (P):

This component will be assessed through the submission of a database project completed in groups and an individual validation test. The project will allow students to apply the knowledge acquired throughout the course, including requirements analysis, conceptual and relational database design, and SQL query

development. The final grade for this component will be obtained from the weighted sum of the two previous activities. The minimum grade required to pass the project is 5, while the individual validation test must be passed with a minimum grade of 3.5. The final grade for this component must be at least 5.

To pass the course, students must meet the minimum grade requirements established for the different assessment activities and obtain a final grade equal to or higher than 5.

TRANSCRIPT GRADE, HONOURS, AND NOT ASSESSABLE STATUS

If the course is passed, the transcript grade will correspond to the final grade obtained according to the criteria described above.

If the course is not passed because one or more assessment activities do not reach the required minimum grade, the numerical transcript grade will be the lower value between 4 and the average grade obtained in the assessment activities.

The following exceptions apply:

- Students who do not participate in any assessment activities will receive the grade Not Assessable (NA). Any student who submits a scheduled assessment activity will receive a grade.
- Students who commit irregularities in an assessment activity will receive the lower value between 3.0 and the numerical grade calculated above (and therefore passing by compensation will not be possible).

Honours (*Matrícula d'Honor*) may be awarded according to university regulations, provided that the final grade obtained is at least 9.

RESIT EXAMINATION

According to the UAB Academic Regulations, in order to participate in the resit examination, students must have previously been assessed through a set of activities whose combined weight represents at least two-thirds of the total course grade. In addition, students must have obtained a minimum average grade of 3 in the course in order to be eligible for the resit.

EI: If students fail or do not attend the individual examinations, these examinations may be retaken on the date assigned during the official examination week.

AA: Assessed activities submitted outside face-to-face sessions may be recovered before the final examination, with a maximum weighting of 80% of the original grade (and therefore a maximum possible grade of 8). Activities carried out during face-to-face sessions cannot be recovered.

P: If the database project grade is below 5, both the project and the corresponding individual validation test must be retaken. The grade of the recovered project cannot exceed 8.

PLAGIARISM AND IRREGULARITIES

Without prejudice to any additional disciplinary measures that may be deemed appropriate, and in accordance with current academic regulations, any irregularity committed by a student that may lead to a modification of the grade will result in a grade of zero (0). Assessment activities graded in this way will not be eligible for resit. If passing one of these activities is required to pass the course, the course will be failed directly, without the possibility of recovering it during the same academic year.

Such irregularities include, among others:

- Copying all or part of a practical assignment, report, or any other assessment activity.
- Allowing another student to copy.
- Submitting group work that has not been entirely completed by the group members.
- Presenting as one's own materials prepared by a third party, including translations or adaptations, and in general any work containing elements that are not original and exclusively produced by the student.
- Having communication devices (such as mobile phones, smartwatches, etc.) accessible during individual theoretical-practical assessment tests.
- Using generative artificial intelligence to replace the student's own learning activity.

In summary: copying, allowing copying, or plagiarising in any assessment activity is equivalent to a FAIL with a grade lower than 3.5.

USE OF AI

In this course, the use of Artificial Intelligence (AI) technologies is permitted exclusively as a support tool for learning. Under no circumstances may these tools be used to replace the student's learning activity or to generate assessment activities submitted as the student's own work. Assessment activities suspected of having been generated using these tools may receive a grade of 0.

COMMUNICATION

Assessment dates and activity submission deadlines will be published on the Virtual Campus platform (<http://cv.uab.cat>) and may be subject to scheduling changes due to the need to adapt to possible incidents. Any changes will always be communicated through the Virtual Campus, which will be the usual platform for information exchange between teaching staff and students (materials, group management, submissions, grades, and communication with instructors).

Examination review dates will also be announced through this platform once grades have been published.

Examination reviews will take place either in person or through the assessment platform on the dates proposed by the teaching team.

Bibliography

A. Silberschatz, H. F. Korth, S. Sudarshan. *Database System Concepts*, 5th Edition, McGraw-Hill, 2005.

(Online version available at:

https://www.gob.mx/cms/uploads/attachment/file/1001638/Fundamentos-de-bases-de-datos_a.pdf)

R. Elmasri, S. B. Navathe. *Fundamentals of Database Systems*, Addison-Wesley, 1997.

Software

Oracle SQL Developer will be used (it can be downloaded free of charge with a student account).

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(PAUL) Classroom practices	1	Catalan	second semester	afternoon
(PLAB) Practical laboratories	1	Catalan	second semester	afternoon
(PAUL) Classroom practices	2	Catalan	second semester	afternoon
(PLAB) Practical laboratories	2	Catalan	second semester	afternoon