esade

TEACHING GUIDE - 2025-2026

Database Management and Design

UGRA_015729

Departments	Data, Analytics, Technology and Artificial Intelligence (DATA), Dept. of Operations, Innovation & Data Sciences
Teaching Languages	English
ECTS	6
Teacher responsible	Jordi Tarda Valls - jordi.tarda@esade.edu

Course Goals

By the time the students finish the course, they should be able to :

- Understand key concepts of relational database management systems
- Understand the importance of database design through Entity-Relationship Diagrams and models
- Design and understand queries using Structured Query Language (SQL)
  - Perform a real-world database design and implementation in MySQL
- Understand key concepts of NoSQL Databases.
- Acquire practical skills for amnipulating data in MongoDB

Previous knowledge

No prior knowledge of databases is required for this course, but it is assumed that students are used to working with code editors. Previous knowledge of programming languages is useful but not essential.

Prerequisits

This course does not require any prerequisites.

Teaching methodology

The course requires students to be active participants in their own learning. Students are required to do some autonomous work to prepare each session. This preparatory work involves reading the content of the next session, reviewing the prior session, and doing and submitting exercises. The details of the preparatory work can be found in the website of the course.

The sessions will be divided into lectures and practicals. In the lecture sessions, the foundations and key concepts of each topic will be covered, while in the practical sessions, students will engage in 100% hands-on exercises, activities, and challenges, either individually or in groups. This course requires that all students bring their own laptop computer to the sessions to carry out different activities.

Class attendance is compulsory. In several sessions, students will do individual quizzes and team challenges. Those individual quizzes and team challenges will be announced in the course website before the session.

Description

Course contribution to program

This course is essential for consolidating and expanding the knowledge acquired in prior areas such as computing and data programming. By providing a deep understanding of how to structure, store, and manage large volumes of data, this course is crucial for the development of advanced and efficient predictive models in artificial intelligence. It also facilitates the creation of compelling narratives through data visualization, ensuring quick and reliable access to relevant information.

Moreover, this course complements financial analysis and marketing strategies by providing the necessary tools for data-driven decision-making. It also plays a crucial role in strategic software development by integrating database management into the application development lifecycle. In the following year, the acquired knowledge will be essential for advancing in deep neural networks and cloud solutions, enabling a seamless integration of complex data systems and the development of advanced solutions. In summary, this course is a key pillar for success in the business and technology environment, preparing students to lead in data-driven organizations.

Short description

The pervasive digitalization of life has become a new reality for organizations,
sectors, and society in general, and has turned data into the most valuable resource of organizations. The capacity of digital technologies to gather, process, store and analyze large amounts of data is not only reshaping the way organizations structure their processes in order produce and deliver products and services, but is also transforming industries giving room for new business models that displace incumbent ones.

The primary purpose of this course is to provide students with a level of knowledge and skills that allow them to have a better understanding of how to manage and exploit data. Basic technical skills for the class covers database design and implementation: including entity-relationship modeling, normalization, structured query language and how to cretate and manipulate the information in a NoSQL Databases

Bibliography

Connolly, T. & Begg, C., Database Systems: A Practical Approach to Design, Implementation, and Management, Pearson, 6th Edition (Book)
Coronel, C. & Morris, S., Database Systems: Design, Implementation, & Management, Cengage 13th Edition (Book)

Amit Phaltankar, Juned Ahsan, Michael Harrison, and Liviu Nedov, MongoDB Fundamentals, Packt Publishing Ltd., 978-1-83921-064-8 (Book)

Content

#	Topic
1	Structured Query Language - SQL -
2	Relational Database Conceptual Modeling
3	NoSQL database funfamentals
4	Manipulating data in MongoDB

Assessment

Tool	Assessment tool	Category	Weight %
Quizzes/tests	Individual quizzes	Retake and ordinary round	15.00%
Group project	Teamwork - Challenges	Retake and ordinary round	20.00%
Written and/or oral exams	Mid-term exam	Ordinary round	10.00%
Written and/or oral exams	Final Exam	Ordinary round	55.00%
Attendance and punctuality	Attendance. In accordance with ESADE regulations, attendance is mandatory for this course. Students who fail to attend 80% of the course will not be allowed to pass and will be required to sit the retake exam.	Ordinary round	0.00%
Written and/or oral exams	Retake Exam	Retake	55.00%

PROGRAMS

DBAI21-Double Degree in Business Administration and Artificial Intelligence for Business (Undergraduates: Business)

DBAI21 Year 3 (Optative)

DBAI23-Double Degree in Business Administration and Artificial Intelligence for Business (Undergraduates: Business)

DBAI23 Year 3 (Mandatory)