Databases and Information Systems

Introduction to Course – A.Y. 2025/2026

Prof. Ing. Lelio Campanile, PhD
Prof. Ing. Mauro Iacono, PhD

Corso di Laurea in Data Analytics
Dipartimento di Matematica e Fisica
Università degli Studi della Campania Luigi Vanvitelli

A.A. 2025/2026

Introduction

- **6 CFU** – 56 hours
- **Instructors:**
  - Prof. Ing. Mauro Iacono, PhD
  - Prof. Ing. Lelio Campanile, PhD
- **Examination:** written exam + oral exam
- **Office hours:** by appointment via email or after lectures

Contact Information

Prof. Iacono
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Prof. Campanile
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Timetable – A.Y. 2025/2026

Day	Time	Academic Hours
Monday	13:10 – 15:40	3 hours (50 min each)
Friday	11:30 – 13:10	2 hours (50 min each)

Course Duration

- **Start:** Friday, February 20, 2026
- **End:** Friday, May 29, 2026
- **Total:** 56 academic hours (12 teaching weeks + Easter break)

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Goals

- **Introduction to Information Systems** – Information systems, information and data; impact on the company; databases and DBMS; data models; schemes and instances; abstraction levels; data independence; database languages and users
- **Part 1: The Relational Model** – Structures; relations and tables; integrity constraints; keys; referential integrity; relational algebra (union, intersection, difference, selection, projection, join)
- **SQL** – Data types; data definition; data manipulation; SELECT, INSERT, UPDATE; set queries; join queries; nested queries
- **Part 2: Database Design** – Methodologies and models; life cycle of information systems; the Entity-Relationship model; logical design; E-R restructuring; normalization; translation to the relational model
- **Part 3: NoSQL** – Features and utilities; CAP theorem; types of NoSQL databases; main solutions

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Textbooks

Main Textbook

1. P. Atzeni, S. Ceri, S. Paraboschi, R. Torlone, *Database Systems – Concepts, Languages and Architectures*, McGraw-Hill **(Freely Available)**

Additional Materials

- Materials provided during the course

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Course Schedule

Databases and Information Systems – 57 academic hours

Course Schedule – Overview

Week	Topics	Instructor	Hours
1	Introduction to IS + Data Models + DBMS	Prof. Iacono	5
2	E-R Model + Database Design Methodology	Prof. Iacono	5
3	Logical Design (pt. 1)	Prof. Iacono	5
4	Logical Design (pt. 2) + E-R Restructuring	Campanile / Iacono	5
5	Normalization + Translation to Relational Model	Campanile / Iacono	5
6	*Easter Break – no lectures*	–	0
7	Abstraction Levels + Relational Model (pt. 1)	Campanile / Iacono	5
8	★ **1st Midterm Exam** + Relational Model (pt. 2)	Iacono / Campanile	5
9	Relational Algebra	Campanile	3
10	SQL – Data Definition + Basic Queries	Prof. Campanile	4
11	SQL – Advanced Queries	Prof. Campanile	5
12	SQL JOIN	Prof. Campanile	5
13	NoSQL Databases + ★ **2nd Midterm Exam**	Prof. Campanile	4
	Total		**56**

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Examination

Midterm Exams (*Prove Intercorso*)

☞ Important Notice

Midterm exams are **reserved for regularly attending students** (*studenti frequentanti in corso*).

1st Midterm Exam – Week 8

Coverage: Database Design – Entity-Relationship model, logical design, E-R restructuring, normalization
Format: Practical in-class test

2nd Midterm Exam – Week 12

Coverage: SQL and the Relational Model – relational algebra, SQL queries, data definition and manipulation
Format: Practical in-class test

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Written Exam (*Esame Scritto*)

Written Exam – For non-attending students or regular exam sessions

The written exam combines the content of both midterm exams into a **single written test**:

- **Coverage:** All course topics • **Duration:** 3 hours
- Part 1 – Database Design (E-R model, logical design, normalization)
- Part 2 – SQL and the Relational Model (relational algebra, SQL queries)

Oral Exam – **Always Mandatory**

- The **oral exam is always mandatory**, for *all* students (both midterm and written exam paths).
- It covers the entire course syllabus.
- The final grade combines the written component and the oral exam.

Examination – Summary

Component	Content	Who
1st Midterm (Week 8) 2nd Midterm (Week 12)	Database Design SQL + Relational Model	Attending students only
Written Exam	All topics	All students
Oral Exam	**Entire syllabus**	**All students**

Attending Students Path

1st Midterm + 2nd Midterm + Oral

Regular Exam Path

Written Exam + Oral

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Prof. Ing. Mauro Iacono
Professore associato in Sistemi di Elaborazione delle Informazioni

Prof. Ing. Lelio Campanile
Assistant Professor (RTDa)

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Grazie per l'attenzione