M149: Database Management Systems
Depart. of Informatics & Telcos
University of Athens
Class Meets: Mon. 16:00-21:00 (occasionally Fri. 19:00-21:00), Classroom Z
Credits: 4 – Fall 2025

Instructor:
Alex Delis, Office: A37, e-mail: *ad* -at- *di.uoa.gr*, tel. 210-727.5218, Office Hour: Mon. 17:00-18:00

Course URL:
`http://www.di.uoa.gr/~ad/M149/index.html`
You have to check this page on a weekly basis for announcements, updates, and supplemental material.

General Information:
The course objective is to both introduce students to database internals and motivate the use and study of various contemporary data management approaches. Such approaches are enabling mechanisms for modeling diverse data used in contemporary applications and help drive the development of modern software systems.

The course covers relational modeling and *SQL*, storage and file structures, indexing approaches including hashing, linear-hashing, multi-dimensional indexes and bitmaps, query processing methods, query optimization approaches based on syntactic transformations, cost-driven, heuristic and multi-query methods for compiling evaluation plans, transactions processing and correctness criteria, mechanisms for attaining high–throughput concurrent transactional processing as well as recovery techniques in light of failures. Advanced topics are also discussed including multi-tier data management architectures, *no-SQL* databases, new data types, and data streams.

The workload of the course is expected to be *above average* with homework assignments, two term programming projects, and a final examination. Class attendance is encouraged. Principles of Operating Systems and elements of Algorithms are essential and will be helpful in the successful completion of the class. Strong `Java` or `Python` programming experience is expected.

Books:
1. A. Silberschatz, H.F. Korth, and S. Sudarshan, *Database System Concepts,* 7th Edition, McGraw Hill, New York, NY 2020.
2. R. Ramakrishnan and J. Gehrke, *Database Management Systems,* Third Edition, McGraw Hill, New York, NY 2003.

Additional References:
1. H. Garcia-Molina, J.D. Ullman, and J. Widom, *Database Systems: The Complete Book*, Prentice Hall, Upper Saddle River, NJ 2002.
2. P.A. Bernstein, V. Hatzilacos and N. Goodman, *Concurrency Control and Recovery in Database Systems*, Addison Wesley, Reading, MA 1987.
3. Research papers appearing on the web-page of the class.

Grading:
- Two Programming Assignments: 40% (20% each)
- Homework Assignments: 8%
- Midterm Examination: 17%
- Final Examination: 35%

Other Issues:
- Takers of the class abide by the UoA Graduate Ethics Code for academic work.
- You will have to demonstrate your projects to receive respective grades.
- Homeworks are due in class a week after they are announced.
- Register on e-class at `https://eclass.uoa.gr/courses/DI690/`