

Course title: DATABASES

Instructor: E. Tiakas

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Semester: Winter

ECTS: 6

Workload during semester: 150 hours

Course overview

Introduction. Database Systems Architecture. Models for Database Design. The Entity-Relationship (ER) Model. The Extended Entity-Relationship Model (Extended ER). The Relational Model. Data Modeling Tools. The SQL Language. Relational Algebra. Functional Dependencies and Normal Forms.

Course outline per week

1st week: Introduction. Database Systems Architecture.

2nd week: Models for Database Design.

3rd week: The Entity-Relationship (ER) Model.

4th week: The Extended Entity-Relationship Model (Extended ER).

5th week: The Relational Model.

6th week: Data Modeling Tools.

7th week: The SQL Language (DDL).

8th week: The SQL Language (DML, simple queries).

9th week: The SQL Language (more advanced queries – part a).

10th week: The SQL Language (more advanced queries – part b).

11th week: The SQL Language (complex queries).

12th week: Relational Algebra.

13th week: Functional Dependencies and Normal Forms.

Capabilities developed in the course

Capability 1: Disciplinary Knowledge and Practice

Capability 2: Critical Thinking

Capability 3: Solution Seeking

Capability 4: Independence and Integrity

Learning outcomes

Students after completing the course will be able to:

- Design, implement and manage Databases.
- To use models and tools for the development of Databases.
- To solve practical design and implementation problems methodically (by completing the projects).

Assessment methods

Project Assignments 30%

Exams 70%

NOTE: A student's assessed work may be reviewed for potential plagiarism or other forms of academic misconduct.

Delivery mode

Lectures

NOTE: The recording of any class on a personal device requires the permission of the instructor.

Learning resources

Lecture notes, course material, additional material (open software tools, SQL examples and queries code).

Digital platforms: Eclass (eclass.gunet.gr) / Moodle

Reading list

1. Hector Garcia-Molina and Jeffrey D. Ullman and Jennifer Widom, "Database Systems: The Complete Book", Prentice Hall, 2002.
2. R. Ramakrishnan, J. Gehrke, "Database Management Systems", McGraw-Hill, 2002.
3. C. J. Date, "Introduction to Database Systems", Addison Wesley, 2003.
4. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", Addison Wesley, 2006.
5. A. Silberschatz, H.F. Korth, S. Sudarshan, "Database System Concepts", McGraw-Hill, 2005.