INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	UNDERGRADUATE						
COURSE TITLE	**Design and Use of Database Systems**						
COURSE CODE	**K29**		**Semester**	**4**	**ECTS**	**7**	
TEACHING HOURS per week	**THEORY**	**3**	**SEMINAR.**	**1**	**LABORATORY**	**1**	
COURSE TYPE	**Select one of the following and delete the rest** Compulsory (YM) **K** | **E1** | **E2** | **E3** | **E4** | **E5** | **E6**						
URL	https://eclass.uoa.gr/courses/D47/						
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	K08						
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK						
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO						

COURSE CONTENT
The course covers the upper levels of a database management system (DBMS), i.e. the conceptual and external or view levels. Specifically, the course provides students with an overview of databases; database history; the different conceptual models used to design a database, in particular the Entity-Relationship (E-R) model; the translation from the E-R to the Relational Model; Functional Dependencies and Normalization; the Relational Model; the Structured Query Language (SQL) to access and manipulate databases, the Query-By-Example language (QBE), Views and Constraints; Relational Algebra; the design and development of web applications to interface with databases using e.g., python, PHP, JDBC.

STUDENT LEARNING OBJECTIVES
To introduce students to relational database concepts, data modeling, the interaction and manipulation of data with the use of SQL, and the design of applications to interface with databases. Upon successful completion of the course the student will be able to:

- Design conceptually and model how data is structured and organized
- Use the Entity-Relationship model and draft E-R diagrams using modeling tools such as MySQL Workbench
- Design relational databases using the Relational Model
- Optimize database schemas with Normalization
- Define retrieval queries, specify Constraints and perform operations on a database using SQL
- Define basic retrieval queries using Relational Algebra
- Develop web applications to interface with databases using the Python programming language

TEACHING AND LEARNING METHODS - ASSESSMENT	
TEACHING METHOD	In Class (Face to Face)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process supported through the use of the e-class platform (Teaching material; Announcements; Discussions on projects and laboratory assignments; Task assignments; Student groups; External links and related resources) Email communication Live transmission of lectures Ability to view recorded lectures Programming support via laboratory seminars
TEACHING ORGANIZATION *Describe in detail the way and methods of teaching:* *Enhanced Lectures,* *Online Lectures,* *Seminars,* *Tutorial,* *Laboratory,* *Laboratory Exercise,* *Study & analysis of literature,* *Practice (Positioning),* *Interactive teaching,* *Developing a project,* *Individual / group work* *Telework (reference to tools) etc.* *Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS*	

Activity	***Student Workload*** *(hours)*
Lectures (physical presence)	39
Seminars (physical presence)	13
Laboratory practice (physical presence)	13
Group project #1 (team of 2-3)	30
Individual project #2	30
Group project #3 (team of 2-3)	30
Independent Study	20
Total Course (25 hours of workload per unit of credit)	***175***

ASSESSMENT OF STUDENTS *Description of the assessment process* *Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other* *Fully defined evaluation criteria are mentioned and if and where they are accessible to students.*	Evaluation of theory by written examination and design and programming by a compulsory project consisting of 3 parts. Grade Feedback is given in the written examination at the level of questions. In the project a rubric is given and feedback is provided accordingly with explanations in case of missing grades.

Assessment methods	***Number***	***Percentage***
Written examination	1	50%
Project	1	50%

LITERATURE AND STUDY MATERIALS / READING LIST

Basic Book

Elmasri, R., & Navathe, S. B. (2015). *Fundamentals of Database Systems* (7th Edition). Pearson. Edited and translated in Greek by Prof. M. Chatzopoulos.

Ullman, J. D., & Widom, J. (2007). *A First Course in Database Systems* (2nd ed.). Prentice Hall. Translated in Greek.

Notes, presentations, tutorials on programming and tools are provided on e-class.