COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT AND AGRICULTURAL ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF NATURAL RESOURCES DEVELOPMENT AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	Postgraduate		
COURSE CODE	**630306**	**SEMESTER**	**1**
COURSE TITLE	DATABASES		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Practical Exercises	2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	*General background*
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

After successfully completing the course, a student will be able to:
- Design an ER diagram from specifications and convert it to relational database tables.
- Formulate queries in relational algebra.
- Create a database and its tables, insert/update/delete records, write SQL queries corresponding to all basic operators of relational algebra.
- Write aggregate queries and nested queries.
- Generate views, write stored procedures, and triggers in MySQL.
- Normalize the tables of a database.
- Acquire a fundamental background in managing transactions in a relational DBMS and concurrency protocols.
- Create transactions in MySQL.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*

Working in an international environment *Working in an interdisciplinary environment* *Production of new research ideas*	*Production of free, creative and inductive thinking* *……* *Others…* *…….*

- *Data and Information Retrieval, Analysis, and Synthesis, Utilizing Necessary Technologies*
- *Decision Making*
- *Autonomous Work*
- *Team Collaboration*

3. SYLLABUS

1. 1. Introduction to Database Management Systems (DBMS).
2. 2. Architecture of a DBMS.
3. 3. Data Modeling with the Entity-Relationship Model.
4. 4. Relational Model.
5. 5. Relational Algebra and Relational Calculus.
6. 6. SQL Language.
7. 7. Table Joins and Related SQL Queries.
8. 8. Aggregation and Division Queries in SQL.
9. 9. Functional Dependencies and Multivalued Dependencies.
10. 10. Normalization.
11. 11. Transaction Processing and Concurrency Control Techniques.
12. 12. Physical Organization of a DBMS. Storage Media. File Organizations and Directories.
13. 13. Tree-based Structures and Files (B-trees, B+ trees). Fragmentation.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In classroom
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Support of the educational process through the e-class electronic platform, Use of ICT in Laboratory Education (specialized software), Alternative educational software, Use of ICT in communication with students.
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	***Semester workload***
Lectures	36 hours
Practical exercises and case studies	50 hours
Exercises and presentations	39 hours
Course total (25 workload hours per credit unit)	***125***

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure*	1. Written final examination (60%) - Problem-solving with analysis and implementation of relevant methods - Short-answer questions

Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	2. Laboratory work (40%)

5. ATTACHED BIBLIOGRAPHY

Proposed literature:

Συστήματα Βάσεων Δεδομένων, Θεωρία & Πρακτική Εφαρμογή, Ιωάννης Μανωλόπουλος - Απόστολος Ν. Παπαδόπουλος, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ ΜΟΝ. ΕΠΕ, 1η/2006, ΑΘΗΝΑ

• Συστήματα Βάσεων Δεδομένων 6η Έκδοση, Abraham Silberschatz,Henry F. Korth,S. Sudarshan, Χ. ΓΚΙΟΥΡΔΑ & ΣΙΑ ΕΕ, 6η έκδ./2011, ΑΘΗΝΑ

• Θεμελιώδεις αρχές συστημάτων βάσεων δεδομένων, Elmasri Ramez,Navathe Shamkant B., ΔΙΑΥΛΟΣ Α.Ε. ΕΚΔΟΣΕΙΣ ΒΙΒΛΙΩΝ, 6η Έκδοση Αναθεωρημένη/2012, ΑΘΗΝΑ

- Συναφή επιστημονικά περιοδικά:

• IEEE Transactions on Knowledge and Data Engineering

• ACM Transactions on Database Systems