COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	COMPUTER ENGINEERING AND INFORMATICS		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**CEID_NE4348**	**SEMESTER**	**SPRING (8th)**
COURSE TITLE	Database Management Systems II		

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, **Laboratory Exercises**, **Recitation sections**	2, 1, 2	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	TOTAL	5

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialized general knowledge, skills development
PREREQUISITE COURSES:	There are no prerequisite courses. It is however recommended that students have at least a basic knowledge of Database Systems, Data Structures, Algorithms and Programming.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Instruction may be given in English if foreign students attend the course.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.dblab.upatras.gr/gr/DBII.htm

(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*

At the end of this course the student will:

1. Have acquired advanced knowledge in database systems and data management concepts and understand the issues that are necessary for the efficient implementation of such systems.
2. Have understood the basic concepts of query processing and transaction processing as well as the basic concepts of concurrency control, and recovery from failures.
3. Have acquired experience with the usage of advanced indexing structures and tools for multimedia databases.
4. Be able to understand basic concepts of distributed and parallel database systems, data mining and text databases.
5. Be able to apply the acquired knowledge on the topics listed above in designing real systems and new applications.

Competences

At the end of the course the student will have further developed the following skills/competences:

1. Ability to understand not only the basic principles of database management systems, but also

advanced concepts in databases and data management and how these concepts are interrelated with the performance of working systems.
2. Ability to apply these concepts in order to design and implement efficient database management systems and multimedia management systems.
3. Ability to work cooperatively in order to solve problems that arise during the development of a full-fledged working software system that supports simple alphanumeric data but also multimedia.
4. Studying abilities that are needed for continuous development of such systems that have increased demands.

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

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
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Working independently
Team work
Production of new research ideas
Project planning and management
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

(3) SYLLABUS

- Spatial Access methods
- Indexing structures for multimedia; Image Databases
- Query processing; Query optimization
- Object-oriented, object-relational DBMSs
- Transaction processing; Concurrency control; Deadlocks; Recovery
- Distributed and Parallel Databases
- Multimedia Databases; Queries by content
- Text Databases; XML
- Introduction to Data Mining
- Data stream management systems
- NoSQL databases, NewSQL databases
- Mobile databases
- Web databases
- Fractals in databases
- Future directions

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	**We use Information and Communications Technology in communication with students. We use e_class, e_mail, forum. The course has a web site.**

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	26
Laboratory Practise	13
Recitation	26
Project	30
Report writing	10
Study and analysis of bibliography	40
Course total	***145***

STUDENT PERFORMANCE EVALUATION

Description of the evaluation procedure

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.

(1) Written examination (70% of the final grade).
(2) Project (30% of the final grade)

(4) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. A. Silberschatz, H.F. Korth, and S. Sudarshan, Συστήματα Βάσεων Δεδομένων –Η Πλήρης Θεωρία των Βάσεων Δεδομένων, 6η έκδοση, 2011, Εκδόσεις Μ. Γκιούρδας.
2. R. Elmasri, S. B. Navathe, Θεμελιώδεις Αρχές Συστημάτων Βάσεων Δεδομένων, 2016, 7η έκδοση Εκδόσεις Δίαυλος.
3. Raghu Ramakrishnan: Database Management Systems, McGraw Hill.
4. Jeffrey Ullman: Principles of database and knowledge-base systems.
5. Michael Stonebraker, Readings in database systems, Morgan Kaufmann.
6. Christos Faloutsos, Searching Multimedia Databases by Content, Kluwer Academic Press.

- *Related academic journals:*

ACM Transactions on Database Systems,
IEEE Transactions on Knowledge and Data Engineering
VLDB Journal
Information Systems
SIGMOD Record