COURSE OUTLINE

(1) GENERAL

SCHOOL	ECONOMICS AND POLITICAL STUDIES		
ACADEMIC UNIT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES PROGRAM		
COURSE CODE	**CSC301**	**SEMESTER**	**6th**
COURSE TITLE	DATABASES AND DATA MANAGEMENT		

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	3	3
Laboratory lessons	3	4
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	6	7

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background
PREREQUISITE COURSES:	CSC201 - Introduction to Computer Science and Information Processing
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.uoa.gr/courses/ECON397/

(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, the students will be able to:

1. **know the important role of data and data management in applications**
2. **know the main advantages and limitations arising from the use of databases**
3. **design Entity Relationship (ER) diagrams according to the requirements analysis that has preceded the creation of a database**
4. **convert the Conceptual Schema of a Relational Database into the corresponding Logical Schema**
5. **create relational databases in a Database Management System like MS-Access, Oracle, PostgreSQL, MySQL.**
6. **use the SQL language both for defining the database schema and for data**

management (search, update, insert, delete)

7. **become familiar with Financial and Administrative applications with emphasis on the specific requirements of each system**
8. **be aware of current trends (Big Data, NoSQL and distributed databases) in the field of data management and information retrieval**

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
Scientific way of thinking and expression
Decision-making
Working independently
Production of new research ideas
Project planning and management
Production of free, creative and inductive thinking
Working in an interdisciplinary environment

(3) SYLLABUS

1. Introductory concepts: Data and Information, Storage Units, Data Files, Data Structures
2. Databases and Data Models
3. Architecture and overview of Database Systems
4. Conceptual Design and Entity Relationship Diagrams
5. Relational data model, from Entity Relationship Diagrams to the logical schema of a relational database
6. Introduction to Relational Algebra
7. Principles of Relational Database Design and Normal Forms (Normalization)
8. Methodologies and query languages. The SQL language.
9. Database Management Systems (within the context of laboratory courses): Microsoft Access, introduction to the Oracle Database, PostgreSQL and MySQL environment
10. Presentation of Financial and Administrative applications: analysis, design and implementation
11. Big Data, NoSQL and distributed databases

(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*	**Use of projector for Powerpoint presentations in teaching.** **Use of e-class for posting learning material and announcements.** **Use of email for communication with students.** **Use of Database Management Systems for laboratory courses**
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	39
Workshops and laboratory exercises	40
Project	35
Literature study and analysis	68
Course total	***182***

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.*	The course evaluation is in Greek. 1. Final written exam (70%) which includes a combination of questions: - short answer - problem solving - multiple choice - knowledge organization and synthesis 2. Assignment (30%) - Design and development of a comprehensive Database application which begins in the second week of the course, and each stage of its implementation is consistent with the theoretical framework presented in the lectures The evaluation criteria are announced in the first lecture and are posted on the course's e-class.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Σχεσιακές Βάσεις Δεδομένων, Έκδοση: 3η έκδ./2021, Συγγραφείς: Κεχρής Ευάγγελος ΕΚΔΟΣΕΙΣ ΚΡΙΤΙΚΗ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΕΠΙΣΤΗΜΟΝΙΚΩΝ ΛΟΓΟΤΕΧΝΙΚΩΝ ΚΑΙ ΚΑΛΛΙΤΕΧΝΙΚΩΝ ΕΚΔΟΣΕΩΝ
2. Εισαγωγή στις βάσεις δεδομένων και η γλώσσα SQL, Έκδοση: 1/2025. Συγγραφείς: Ευαγγελία Πετράκη. ΕΚΔΟΣΕΙΣ ΤΣΟΤΡΑΣ ΑΘΑΝΑΣΙΟΣ Ε.Ε.
3. Βάσεις Δεδομένων και SQL: Μια πρακτική προσέγγιση, Αθανάσιος Σταυρακούδης, 2η έκδοση, 2015, Εκδόσεις Κλειδάριθμος ΕΠΕ
4. R. Ramakrishnan, J. Gehrke: Database Management Systems, 3rd Edition. McGraw Hill, 2000, Συστήματα Διαχείρισης Βάσεων Δεδομένων 3η Έκδοση, Τόμος Α, εκδόσεις Τζιόλα 2012
5. Θεμελιώδεις Αρχές Συστημάτων Βάσεων Δεδομένων, R. Elmasri, S.B. Navathe, Μετάφραση- Επιστημονική Επιμέλεια Μιχάλης Χατζόπουλος, Εκδόσεις Δίαυλος
6. Jeffrey Ullman, Jenniffer Widom, A First Course in Database Systems, Βασικές αρχές για τα Συστήματα Βάσεων Δεδομένων, Εκδόσεις Κλειδάριθμος, 2008
7. Ε.Ι.Γιαννακουδάκης: Συστήματα Βάσεων Δεδομένων, Β' Έκδοση, Τόμος Α, Εκδόσεις Μπένου, 2009

- Related academic journals:

ACM Transactions on Database Systems (TODS)
IEEE Transactions on Knowledge and Data Engineering
International Journal of Database Management Systems (IJDMS)