# COURSE OUTLINE

## (1) GENERAL

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|---|---|---|---|
| **SCHOOL** | SOCIAL SCIENCES | | |
| **ACADEMIC UNIT** | CULTURAL TECHNOLOGY AND COMMUNICATION | | |
| **LEVEL OF STUDIES** | POSTGRADUATE | | |
| **COURSE CODE** | PLR 142 | **SEMESTER** | 7$^{o}$ |
| **COURSE TITLE** | CONTEMPORARY ISSUES OF 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 | 2 | 3 |
| Laboratories | 1 | 2 |
| | | |
| *The organization of teaching and the teaching methods used are described in detail at (4).* | 3 | 5 |

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| **COURSE TYPE** *General background, Special background, specialized general Knowledge, skills development* | Core Course/Special Background |
| **PREREQUISITE COURSES** | Databases |
| **LANGUAGE OF INSTRUCTIONS and EXAMINATIONS** | Greek |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes |
| **COURSE WEBSITE (URL)** | https://eclass.aegean.gr/courses/131282/ |

## (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 learning outcomes for each qualification cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptions for level 6, 7 & 8 of the European Qualification Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

At the end of this course, the students will be able to:

- Delve into Relational Database model, Entity-Relationship model and Relational Algebra.
- Understand the meaning of Normalization, the different forms and to be able to apply it within practical examples.
- Know how to use Structured Query Language (SQL) by implementing a complex variety of questions containing sorting, grouping and related questions.
- Induction to the Relational Databases' real world through the inner join and natural join statements.
- Modify and update databases.
- Enrich knowledge in databases through practical examples and programming code.

**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?*

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|---|---|
| *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
- Production of free, creative and inductive thinking
- Team work
- Practice Critical Thinking
- Project planning and management

## (3) SYLLABUS

This course is an extension of the "Database Systems" course and concentrates on the design and implementation of the Database Management System (DBMS). It is also concentrates on the advanced issues of SQL language. The basic course aim is the students' preparation and enriching knowledge on designing and implementing applications using open source PostgreSQL language. Special attention is given on the smooth transition of the "Database Systems" course of the 5$^{th}$ semester to the specific "Contemporary Issues of Databases" course.

Lectures

1. Brief review on the Relational Database and the Entity-Relationship models
2. Brief review on the extended ER model and the different constraints
3. Relational Algebra
4. First Normalization Form (NF) – Functional dependencies
5. Second and Third Normalization Form
6. Boyce-Codd Normalization Form and other NFs
7. SQL (Basic queries – Sorting and ordering)
8. SQL (Aggregate functions – Grouping)
9. SQL (Select queries with multiple tables)
10. SQL (Subqueries – Update databases)
11. Data storage
12. Transactions
13. Contemporary Issues of Databases

## (4) TEACHING and LEARNING METHODS - EVALUATION

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|---|---|
| **DELIVERY**<br>*Face-to-face, Distance learning, etc.* | Face-to-face |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY**<br>*Use of ICT in teaching, laboratory education, communication with students* | Use web-based open source software for laboratory education.<br>Use ICT in teaching and communication with students |
| **TEACHING METHODS**<br>*The manner and methods of teaching are described in detail.*<br>*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.*<br><br>*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* | <table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>13 *2 hours = 26 hours</td></tr><tr><td>Lectures' study</td><td>13*4 hours = 52 hours</td></tr><tr><td>Laboratory practice</td><td>13*2 hours = 26 hours</td></tr><tr><td>Laboratory preparation and semester assignment</td><td>35 hours</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>Course total</td><td>139 hours</td></tr></table> |
| **STUDENT PERFORMANCE EVALUATION**<br>*Description of the evaluation procedure*<br><br>*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*<br><br>*Specifically-defined evaluation criteria are given, and if and where they are accessible to students.* | The evaluation of students' performance is conducted at the end of the semester with exams and with a final assignment. Students may use their books or notes from the lessons and the laboratory exercises (open book exams).<br><br>The evaluation criteria are announced during the first introductory lesson and they can be found at the storage content in the course's area in the University e-class platform (eclass.aegean.gr). The file with the first lesson contains all the information.<br><br>The students' performance evaluation is based on the grade of the final exam, with a weighted percentage of 60% (grade * 60%) and on the final assignment released at the middle of the course, with a weighted percentage of 40% (grade * 40%). The final assignment is mandatory. |

## (5) ATTACHED BIBLIOGRAPHY

*- Suggested bibliography:*


- Databases and SQL: A practical approach, Athanasios Stavrakoudis
- Fundamentals of Database Systems (7th Edition), Ramez Elmasri and Shamkant B. Navathe
- Database Management Systems, (3rd Edition), Raghu Ramakrishnan and Johannes Gehrke


*-Related bibliography*


- Database Systems: The Complete Book (2nd Edition), Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom
- Modern Database Management, Hoffer A. Jeffrey, Ramesh V. Topi Heiki