

# Description of Course Unit

**Master in Informatics and Computing Engineering**  
**Database and Web Applications Laboratory**  
**Instance: 2014/2015**

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[\*Institutional page\*](#)

## General information

**Course Unit:** Database and Web Applications Laboratory  
**Code:** EIC0085  
**Programmes:** MIEIC, 3º  
**Academic Year:** 2014/2015  
**Semester:** 2S  
**Credits:** 7 ECTS  
**Hours/Weeks:** 1x2T, 6x3P  
**Teachers:** [João Correia Lopes](#) | [Sérgio Nunes](#)

## Teaching language

Portuguese. Suitable for English-speaking students.

## Objectives

### BACKGROUND

The unit aims at revisit the learning outcome of databases and web languages and technologies, providing a practical perspective on this core areas of computer engineering.

### SPECIFIC OBJECTIVES

In this course, the students will learn how to design and develop web-based information systems backed by database management systems.

## Skills and learning outcomes

After completing this course, the student will be able to:

1. Specify the requirements of the web-based information system;
2. Obtain the conceptual model of the information system's data;
3. Obtain and validate the logical relational database schema of the system's database;
4. Obtain the physical schema of the database and tune the logical relational schema;
5. Design and implement queries to access the database using SQL;
6. Design and implement mechanisms for maintaining the integrity of the data;
7. Specify the web interfaces and business logic of the information system;
8. Implement the web components of the system using PHP, HTML, CSS and JavaScript;

9. Ensure that the web interfaces are in accordance with accessibility and usability standards.

## Work mode

Classroom.

## Previous knowledge

Databases: data modeling with UML, relational model, SQL language.

Web languages and technologies: HTTP protocol, HTML, CSS and JavaScript languages.

## Program

- Development of a Web application supported by a database: requirements gathering, design, modeling, implementation and documentation.
- General notions of architecture of web applications using client scripting languages (JavaScript) and server (PHP).
- Presentation of the Document Object Model (DOM), use of Ajax framework and API for data access.
- Design of relational databases using data modeling languages (UML), the SQL language and procedural extensions to SQL.
- Identification and maintenance of business rules: on the interface (JavaScript), on the business logic and in the database (triggers); define transactions.
- General notions of usability and Web Design.

## Main bibliography

- R. Ramakrishnan, J. Gehrke, *Database Management Systems*, McGRAW-Hill International Editions, 3rd Edition, 2002, ISBN=0-07-246563-8. [Library](#)

## Complementary bibliography

- Jeffrey D. Ullman, Jennifer Widom, *A First Course in Database Systems*, Prentice-Hall, 3rd Edition, 2008, ISBN=978-0-13-600-637-4. [Library](#)
- Scott Ambler, *The Object Primer*, Cambridge University Press, 3rd Edition, 2004, ISBN: 978-0-521-54018-6 [Library](#)
- Zalewski, Michal, *The tangled Web: a guide to securing modern Web applications*, No Starch Press, Inc. ed, 2011, ISBN=978-1-59327-388-0. [Library](#)
- Jakob Nielsen, *Designing Web Usability: The Practice of Simplicity*, New Riders Publishing, Indianapolis, 2000, ISBN=1-56205-810-X. [Library](#)

## Teaching procedures and learning activities

The lectures will be used for presentation of the scripts of the work and representative examples and their discussion, analysis of assessments and brief introductions to the technologies they use. The practical classes will be used for laboratory project development as a group project with the teacher as a consultant.

## Support software

- PHP
- PostgreSQL
- Smarty Library
- jQuery Library

## Keywords

Physical sciences > Computer science > Informatics

## Evaluation type

Distributed evaluation without final exam

## Registered evaluation and occupation components

Description	Type	Time (Hours)	Date of conclusion
Attendance (estimated)	Lectures	75	
User requirements specification	Laboratory work or fieldwork	20	16/03/2015
Database specification	Laboratory work or fieldwork	22	13/04/2015
Architecture specification and Vertical prototype	Laboratory work or fieldwork	30	11/05/2015
Product	Laboratory work or fieldwork	40	01/06/2015
Demonstration	Attendance	5	08/06/2015
Individual Questionnaire	Exercises	0	29/04/2015
	Total:	192	

## Admission to exams

The practical work will be assessed during the laboratory classes, through the delivery of the artifacts.

The theoretical concepts are evaluated using an individual questionnaire with multiple choice questions.

The approval for the course is conditional on the student obtaining 40% in the individual response questionnaire and 50% in each of the components of the practical assessment.

A student that does not participate in an evaluation component may have an assessment to that component different from the group to which he belongs.

Given the laboratory nature of the course, it is not possible to make an overall evaluation based on a single moment and therefore the practical work can not be replaced by a single exam.

## Final grade

Classification = 80% NP + 20% NI

Being NP = 20% ER + 20% EBD + 20% EAP + 40% PA

Legend:

NI - Individual multiple choice questionnaire

NP - Practical work

ER - Requirements Specification

EBD - Database Specification

EAP - Architecture Specification and Vertical Prototype

PA - Product and Presentation

The final classification of the practical component (NP) can vary from element to element in the same group, plus or minus 2 values, based on the opinion of the teachers and the self-assessment performed by each group.

## Special assignments

There are no special works or tests.

## Special evaluation (TE, DA, ...)

The project evaluation, conducted in a group, is the same for all students regardless of enrollment regime.

Students exempted from classes must agree regular meetings with teachers to keep up with the practical work. Regarding the final presentation and the individual assessments, the rules are the same as for the regular students.

## Improvement of final/distributed classification

Students may improve the mark in the course's next edition.

— JCL, SSN

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