Databases

Academic Year: (2019 / 2020)   **Review date: 02-05-2019**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: RUIZ MEZCUA, MARIA BELEN

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

knowledge organization and representation

OBJECTIVES

This course aim is to understand the databases roll in an Information System, to know the features which define a
Databases System, and to acquire skills to implement a Databases Systems through different data models.
1. Cross/Generic Capabilities
- Analysis and synthesis abilities
- Organize and plan abilities
- Troubleshooting
- Teamwork
- Ability to apply knowledge in practice
2. Specific Capabilities
Cognitive (Knowledge)
- Fundamentals of Databases
- Databases development methodology
- Entity/ Relationship data model
- Relational data model
Procedural/Instrumental (Know how)
- Database Design to different abstraction levels
- Implementing Database Systems using a DBMS
Attitudinal (To be)
- Ability to create designs (creativity)
- Discuss and clarify the diverse solutions for a problem
Generals: CG1, CG2, CG3, CG4, CG7, CB2, CB3, CB4, CB5
CROSS: CT2, CT3,CT4SPECIFICS: CE1, CE2, CE3, CE4,CE7,CE11, CE12

DESCRIPTION OF CONTENTS: PROGRAMME

The descriptors associated with the subject are: Basic concepts of databases. The role of database
managment system. Application of a methodology for the development of databases. Data models needed
to carry out a methodology. The Entity-Relationship model. The Relational model. Transformation rules
from model to model and its implementation in a commercial DBMS. Case studies to develop a database.

Programme:
Topic 1. The Databases roll in Information Systems
1.1. Information Systems Definition
1.2. Information System Components
1.3. Databases in the Information System

Topic 2. Foundations of Databases
2.1. Databases Definition
2.2. Databases advantages and uses
2.3. Levels and roles

Topic 3. Databases Management System (DBMS)
3.1. DBMS: the bridge between user interface and database.

3.2. Features and functions.
3.3. Commercial DBMS

Topic 4. Database development methodology
4.1. Methodology definition
4.2. Methodology Application
4.3. Data Models
4.4. Main phases
4.5. Advantages
Topic 5. Entity/Relationship model (ER)

5.1. Basic elements
5.2. Conceptual phase in the development methodology

Topic 6. Relational model
6.1. Basis elements
6.2. Logical phase in the development methodology
Topic 7. Mapping between ER and relational model

7.1. Rules
7.2. Mapping between conceptual and logical model

LEARNING ACTIVITIES AND METHODOLOGY

- Theory: 1.5 ECTS. The aim is to achieve the specific cognitive skills of the subject
- Problem-based learning: 0.75 ECTS. Specific works under the supervision of the teacher about real problems.
- Practical: 1 ECTS. To develop specific skills instrumentals and traversals, such as teamwork, analysis and synthesis. We also aim to develop specific skills attitude.
- Tutoring: 0.5 ECTS. With the presence of teacher to review and discuss the materials and topics presented in class.
- Review: 0.25 ECTS. Set of written tests, oral, practical projects, works, etc.. used in the assessment of student progress. They aim to influence and complement in the development of specific cognitive and procedural skills.
- Self-work practical: 0.5 ECTS. Lab works studied under a didactical guide provided by teacher.
- Self-Theoretical study: 1.5 ECTS. Study of content related to "classroom" (test study, library work, reading, doing problems and exercises, etc.)

ASSESSMENT SYSTEM

The evaluation system includes the evaluation of academic activities and practices designed with the following weights.
The evaluation system includes the evaluation of the directed academic activities and
practices according to the following weighting.
1.- Ordinary Exam: 50%

2.- Continuous evaluation tests: 40%
It consists of two practical examns , test type (40%).
. The practice is mandatory

Percentage Weight of the Final Exam: 50
Percentage weight of the rest of the evaluation: 50

Percentage Weight of the Final Exam 50
Percentage weight of the rest of the evaluation 50

% end-of-term-examination: 50

% of continuous assessment (assigments, laboratory, practicals…):   50

BASIC BIBLIOGRAPHY

- - Elmasri, R. Database systems : models, languages, design, and application programming, Pearson , 2011

- - Silberschatz, A. Database system concepts, McGraw-Hill, 2011

BASIC ELECTRONIC RESOURCES
 - . Microsoft Office Access 2007 : curso interactivo S.l. : Visual Training , [2007]: <a href="http://
https://bibliotecas.uc3m.es/primo-
explore/fulldisplay?docid=34UC3M_ALMA21181308690004213&context=L&vid=34UC3M_VU1&search_scope=TAB1
_SCOPE1&tab=tab1&lang=es_ES" target="_blank">http:// https://bibliotecas.uc3m.es/primo-
explore/fulldisplay?docid=34UC3M_ALMA21181308690004213&context=L&vid=34UC3M_VU1&search_scope=TAB1
_SCOPE1&tab=tab1&lang=es_ES