Data Base

Academic Year: (2022 / 2023) **Review date: 09/06/2021 09:23:31**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: MORENO LOPEZ, LOURDES

Type: Basic Core ECTS Credits : 6.0

Year : 3 Semester : 1

Branch of knowledge: Engineering and Architecture

OBJECTIVES

CB2: Students acquire the ability to apply their knowledge to their work in a professional manner as well as the skills required, normally demonstrated through the formulation and defence of arguments and the resolving of problems within their area of study.
CE8: The ability to differentiate data structures, algorithms, databases and files dealing with the processing of data.
CG1: The acquisition of the knowledge and skills needed to analyse and summarise basic problems related with data sciences and engineering, as well as the ability to resolve and communicate them efficiently.
CT1: Students acquire the ability to communicate their knowledge, orally and in writing, to both specialised and general audiences.

RA1: To have acquired the advanced knowledge and demonstrated understanding of both the theoretical and practical aspects, as well as the work methodology used in the field of data sciences and engineering, with a depth of knowledge that shows their comprehension of even the most cutting-edge aspects of the subject
RA2: Using arguments and procedures created by themselves, students must be able to apply their knowledge, understanding and abilities to the resolving of problems related to complex labour or professional, specialised situations which require the use of creative and innovative ideas.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
   1.1. Information systems. Databases. Database Management Systems
   1.2. Modeling methodologies
   1.3. Management of semi structured and complex data; distributed and noSQL databases
2. Relational database
   2.1. Design of a database. Relational model
   2.2. Query languages. SQL language
   2.3. Introduction database management systems
3. NoSQL Databases
   3.1. Comparison of relational databases to new NoSQL stores
   3.2. NoSQL Databases Types
   3.3. NoSQL Database installation and, use and deployment

LEARNING ACTIVITIES AND METHODOLOGY

AF1: THEORETICAL ¿ PRACTICAL CLASSES. The knowledge students must acquire will be presented. Students will receive the class notes and will be provided with basic reference texts in order for them to be better able follow the classes and carry out the subsequent projects. Students will solve exercises, tackle practical problems and workshops and assessment exams will be carried so that students can acquire the abilities needed.

AF3: STUDENTS¿ INDIVIDUAL OR GROUP WORK.
AF8: WORKSHOPS AND LABORATORIES.

MD1: THEORETICAL CLASS. The professor will give in-class presentations, including computer and audiovisual aids in which the course¿s main concepts are developed. Additional materials and literature will also be provided in order to supplement the student¿s learning.
MD2: PRACTICAL CASES. Students will be required to resolve case studies, problems, etc. posed by the professor both individually and in groups.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

SE1: FINAL EXAM. The overall knowledge, skills, and abilities acquired throughout the entire course will be evaluated.
SE2: CONTINUOUS ASSESSMENT. Projects, presentations, participation in debates, in-class presentations, exercises, practical cases, and work carried out in the workshops throughout the entire course will be evaluated.

There will be a final exam. Besides, there will be projects which explore database design and management.

- Continuous assessment. projects (50%)
- Final Exam (50%)

BASIC BIBLIOGRAPHY

- Connolly, Thomas M, Begg, Carolyn E Database systems : a practical approach to design, implementation, and management, Addison Wesley, 2015

- Elmasri, Ramez, Navathe, Sham Fundamentals of database systems, Pearson Addison Wesley, 2017

- Ramakrishnan, Raghu, Gehrke, Johannes Database management systems, McGraw-Hill, 2003

ADDITIONAL BIBLIOGRAPHY

- Redmond, E. &Wilson Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement , The Pragmatic Bookshelf, 2010

- Sadalage, P. & Fowler NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Pearson Education, 2013

BASIC ELECTRONIC RESOURCES

- MongoDB . MongoDB Docs: https://docs.mongodb.com/?_ga=2.108260938.950754949.1556737455-926847938.1556737455

- ORACLE . Oracle Database Online Documentation: https://docs.oracle.com/cd/B19306_01/index.htm