Database design and administration

Academic Year: (2022 / 2023) **Review date: 25-05-2022**

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: IGLESIAS MAQUEDA, ANA MARIA

Type: Compulsory ECTS Credits : 6.0

Year : 5 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Files and Data bases (Year 2; Term 2)
Visual Development (Year 5; Term 1)

OBJECTIVES

Knowledge of the differences between current database paradigms (Relational, Analytical, NoSQL, etc.).
Theoretical and practical knowledge of Database Design methodologies.
Fundamentals of Database Administration

DESCRIPTION OF CONTENTS: PROGRAMME

1. Database Design Methodologies
2. Fundamentals of Database Administration
3. Physical design of databases
4. Database Settings
5. Paradigms and Database Architectures.

LEARNING ACTIVITIES AND METHODOLOGY

* Lectures: 0.9 ECTS. They aim to achieve the specific cognitive competences of the subject, as well as the transversal competences of analysis and abstraction.
* Practical classes: 0.9 ECTS. They aim to initiate the development of the specific instrumental competences, as well as the transversal competences problem solving and application of knowledge.
* Continuous assessment exercises: 1 ECTS. Initiated during practical classes and completed outside of them, they aim to complete the development of the specific instrumental competences and initiate the development of the specific attitudinal competences, as well as the transversal competences problem solving and application of knowledge.
* Practical work: 1.7 ECTS. Developed without the presence of the teacher, they aim to complete and integrate the development of all the specific and transversal competences, in the resolution of two practical cases where the approach to the problem, the choice of the method of resolution, the results obtained and their interpretation are well documented.
* Tutoring classes: 1 ECTS. Individual (individual tutorials) or group (group tutorials) assistance to students by the lecturer.
* Final exam: 0.5 ECTS. Its aim is to influence and complement the development of specific cognitive and procedural skills. It especially reflects the use made of the master classes.

ASSESSMENT SYSTEM

Exercises and examinations are both learning and evaluation activities. The evaluation system includes the assessment of guided academic activities and practical cases, with the following weights:

1) Guided academic activities 10%
- Present teacher: Critical discussion of different solutions to a given problem and public presentation of solutions.
- Absent teacher: Solution to given problems on design and management strategies.
2) Practical case related to DB Design, Implementation and Administration: 50%
3) Final Exam: 40%. A minimum score of 5 up to 10 is required in this test to take into account the continous assessment

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

BASIC BIBLIOGRAPHY

- Pramod J. Sadalage & Martin Fowler NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Addison-Wesley Professional, 2012
- Andreas Meier & Michael Kaufmann SQL & NoSQL Databases: Models, Languages, Consistency Options and Architectures for Big Data Management, Springer, 2019
- Craig Mullins Database Administration: The Complete Guide to Practices and Procedures, Addison-Wesley Professional, 2012
- Date, C.J. An Introduction to Database Systems (8th Edition), Prentice Hall (2004).
- Joe Celko Joe Celko¿s Complete Guide to NoSQL , Morgan Kaufmann, 2013
- Oracle Oracle Database Administrator Guide. 19c , https://docs.oracle.com/en/database/oracle/oracle-database/19/admin/, 2021
- R Ramakrishnan, J Gehrke Database Management Systems - 3rd Edition, McGraw-Hill, 2013
- Saeed K. Rahimi, Frank S. Haug Distributed Database Management Systems, IEEE Computer Society, 2010
- Shannon Bradshaw, Eoin Brazil, Kristina Chodorow MongoDB: The Definitive Guide, 3rd Edition, O'Reilly Media, Inc., 2019
- Thomas LaRock DBA Survivor: Become a Rock Star DBA, ebook, 2014

ADDITIONAL BIBLIOGRAPHY

- A. de Miguel, P. Martínez, E. Castro, J.M: Cavero, D. Cuadra, A. Iglesias, C. Nieto Diseño de Bases de Datos: Problemas Resueltos, RA-MA (2001).
- Biju Thomas OCA: Oracle Database 12c Administrator Certified Associate Study Guide, Wiley / Sybex, 2014
- D. Cuadra, E. Castro, A. Iglesias, P. Martínez, F.J. Calle, C. de Pablo, H. Al-Jumaily y L. Moreno Desarrollo de Bases de Datos. Casos Prácticos desde el análisis a la implementación (1ª edición), RA-MA, 2007
- De Miguel, A. y Piattini, M. Fundamentos y Modelos de Bases de Datos, RA-MA (1999).
- Elmasri y Navathe Fundamentals of Database Systems, fourth edition, Pearson Addison Wesley, (2003).
- Levene, M. y Loizou, G. A Guided Tour of Relational Databases and Beyond, Springer Verlag (1999).
- Silberschatz, A.; Korth, H.; Sudarshan, S. Fundamentos de bases de datos (5ª edición), McGraw-Hill /Interamericana Mexico (2005).