30253 - Data Warehouses and Data Mining

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process of this course is based on:

- The presentation of contents by the professors, and the resolution of exercises in class.
- The personal study by the students and their participation in class in solving exercises.
- The completion of practical assignments by the students, oriented by the professors, who will develop the theoretical knowledge acquired.
- The development and defense of practical assignments in groups, oriented by the professors.
- The personalized attention to the student, through tutoring, with the goal of revising and discussing materials and

topics presented in class.

It must be taken into account that, although the course has a practical orientation, acquiring the needed theoretical knowledge is also required. Therefore, the learning process emphasizes both the theoretical concepts and the individualized study as well as the development of the practical work.

4.2.Learning tasks

The program helps achieving the expected learning goals by including the following activities...

- In the classes, the program of the course will be developed.
- In problem-solving sessions, problems and exercises will be solved, and activities related to the reading and discussion of relevant texts may be performed.
- Laboratory sessions will be developed in a computer lab. In those sessions, the students will perform practical assignments related with the course.

4.3.Syllabus

1. Introduction to data warehouses:

- Basic concepts:
    - o Analysis of user requirements.
    - o Life cycle.
    - o The problem of integration of data sources.
    - o OLTP transactions vs. OLAP.
- Architecture of data warehouses:
    - o Conceptual, logical and physical design.
    - o ETL process.
- Commercial systems.

2. Introduction to data mining:

- Knowledge and data discovery.
- Web mining.
- Tools for data mining.
- Application fields, such as:
    - o Decision making (Banks-financing-insurance, marketing, health/demographic policies, etc.).
    - o Industrial processes.
    - o Reverse Engineering.

4.4.Course planning and calendar

The calendar of classes, lab sessions and exams, as well as the dates of delivery of evaluation assignments, will be announced in advance, according to the sessions and dates established by the School.

4.5.Bibliography and recommended resources

[BB: Basic bibliography / BC: Complementary bibliography]

Zaragoza:

- [BB] Adamson, Christopher. Star schema : the complete reference / Christopher Adamson . New York : McGraw-Hill, 2010

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- [BB] Jensen, Christian S. Multidimensional databases and data warehousing / Christian S. Jensen, Torben Bach Pedersen, Christian Thomsen . [San Rafael (California)] : Morgan & Claypool Publishers, cop. 2010
- [BB] Kimball, Ralph. The data warehouse toolkit : the definitive guide to dimensional modeling / Ralph Kimball, Margy Ross . 3rd ed. Indianapolis : John Wiley & sons, cop. 2013
- [BC] Malinowski, Elzbieta. Advanced data warehouse design : from conventional to spatial and temporal applications / Elzbieta Malinowski, Esteban Zimányi . [1st ed.], 2nd corr. print. Berlin : Springer, cop. 2009
- [BC] liu, Bing. Web Data Mining: Exploring Hyperlinks, Contents, and Usage Data / Bing Liu Springer, 2011.
- [BC] Sumathi, S.. Introduction to Data Mining and its Applications / S. Sumathi, S. N. Sivanandam Springer, 2006.

List of URLs:

- Slides, problem descriptions, case studies and instructions of practice sessions that the teachers of the course make available through the platform Moodle. [http://add.unizar.es]

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- [BB] Jensen, Christian S.. Multidimensional databases and data warehousing / Christian S. Jensen, Torben Bach Pedersen, Christian Thomsen . [San Rafael (California)] : Morgan & Claypool Publishers, cop. 2010
- [BB] Malibowski, E. Advanced Data Warehouse Design [Recurso electrónico] :]From Conventional to Spatial and Temporal Applications / Elzbieta Malinowski, Esteban Zimányi. Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg, 2008
- [BC] Liu, B. Web data mining :exploring hyperlinks, contents, and usage data / Bing Liu. Heidelberg ; New York : Springer, cop. 2011
- [BC] Sumathi, S. Introduction to Data Mining and its Applications [Recurso electrónico] / S. Sumathi, S. N. Sivanandam Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg, 2006
- [BC] The data warehouse lifecycle toolkit [Recurso electrónico] / Ralph Kimball ... [et al.].. ndianapolis, Ind. : Wiley Pub., 2008