UNIVERSITÀ DI PISA

DECISION SUPPORT DATABASES

SALVATORE RUGGIERI

Academic year	2019/20
Course	DATA SCIENCE AND BUSINESS INFORMATICS
Code	662AA
Credits	6

Modules	Area	Type	Hours	Teacher(s)
DECISION SUPPORT DATABASES	INF/01	LEZIONI	48	SALVATORE RUGGIERI

Obiettivi di apprendimento

Conoscenze
The student who completes the course successfully will be able to demonstrate advanced knowledge of the main issues related to the use of specific databases, the Data Warehouse, organized to create the right models for measurable key business processes, to support informed decisions about how to improve them. The student will acquire knowledge of the fundamental concepts about a conceptual model for designing data warehouses used to analyze key business processes that are measurable and worthy of improvements, the logical data model to implement them, the analytic SQL for producing interesting reports to evaluate the performance of the modeled key processes in order to improve them. Lastly, the student will be aware of how to use a specialized DBMS in the right way to develop a best performing business intelligence application.

Modalità di verifica delle conoscenze
The assessment of the course consists of a written and an oral exam. In the written exam, the student must demonstrate the use of knowledge of the course contents to solve problems. During the oral exam the student must be able to demonstrate knowledge of the course contents and be able to discuss the topics thoughtfully and with propriety of expression.

Capacità
The student will be able to design Data Warehouses, to query them using analytic SQL queries, and to optimize query execution using indexes and materialized views.

Modalità di verifica delle capacità
The written exam will include design exercises, SQL query writing, and optimization analysis exercises.

Comportamenti
The student will be able to critically approach complex design processes which require interpreting user requirements.

Modalità di verifica dei comportamenti
The written exam will include design exercises with user requirements in natural language form.

Prerequisiti (conoscenze iniziali)
A Bachelor level course in Databases, including the following topics: relational algebra, SQL, DBMS architectures.

Indicazioni metodologiche
Teaching methods: face to face lectures and exercises on case studies
Learning activities:

- attending lectures
- participation in discussions
- individual study
- exercises (both with paper&pencil and with software tools)

- office hours

Attendance: strongly advised

Programma (contenuti dell'insegnamento)

The course presents the main approaches to the design and implementation of decision support databases, and the characteristics of business intelligence tools and computer based information systems used to produce summary information to facilitate appropriate decision-making processes and make them more quick and objectives. Particular attention will be paid to themes such as conceptual and logical Data Warehouses design, data analysis using analytic SQL, algorithms for selecting materialized views, data warehouse systems technology (indexes, star query optimization, physical design, query rewrite methods to use materialized views). A part of the course will be dedicated to a collection of case studies.

Bibliografia e materiale didattico

Decision Support Databases Essentials, A. Albano and S. Ruggieri, 2019. The textbook is available for free on the web page of the course.
Databases Essentials, A. Albano, 2019. The textbook is available for free on the web page of the course.

Indicazioni per non frequentanti

There is no specific rule for non-attending students.

Modalità d'esame

The exam consists of a written part and an oral part. The written part lasts 2 hours and it consists of open questions, small exercises, and a Data Warehous design problem. Each question is assigned a grade, summing up to 30 points. Examples with solutions are provided at the course home page. Students are admitted to the oral part if they receive a grade of at least 18 points. Oral consists of critical discussion of the written part and of open questions and problem solving on the topics of the course.
Online exams: during the COVID-19 restrictions, the written part and the oral part will be online. For the written part, students will connect to Google Meet (room code: 662AA) and will activate both microphone and web-cam. Each sheet will include name, surname, student id, and it will be signed. A picture of the sheets will be delivered to ruggieri@di.unipi.it.

Pagina web del corso

http://didawiki.di.unipi.it/doku.php/mds/dsd/

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