Data warehouses and reporting services - course description

General information

Course name	Data warehouses and reporting services
Course ID	11.3-WE-BizEIP-DWandRS-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	E-business
Education profile	practical
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information

Semester	3
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	• dr hab. inż. Marek Kowal, prof. UZ

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Credit with grade
Laboratory	30	2	-	-	Credit with grade
Project	15	1	-	-	Credit with grade

Aim of the course

Familiarize students with the architectures of the data warehouses and the data life cycle in the data warehouse. Presentation of the software used to design the OLAP data structures. Developing the skills of designing and implementing data warehouses. Presentation of data reporting methods. Developing the ability to create reports using charts and pivot tables. Presentation of examples of data warehouse applications in e-business.

Prerequisites

Databases

Scope

Data warehouse architecture. Characteristics of data warehouse subsystems. Review and characteristics of popular data warehouse systems present in IT market.

Data warehouse design. Conceptual, logical and physical model. Types of data warehouses. Data flow from source to target systems. Presentation of tools supporting data warehouse design.

OLAP cubes. Multidimensional data structures. The concept of fact table, measure, dimension, and attribute. Star and snowflake schema. Characteristics of typical operations on multidimensional data cubes. Practical exercises from the design and implementation of OLAP cubes.

Reporting based on multidimensional data cubes. Methods of generating queries for data cubes. Pivot tables. Methods of graphic representation of data. A query language for multidimensional data. Practical exercises involving the preparation of a given report based on data from a multidimensional data cube.

Discussion of examples of data warehouse applications in e-business. Presentation of sample data warehouse projects.

Teaching methods

Lecture - conventional lecture using a video projector.
Laboratory - practical exercises in the computer laboratory.
Project - project implementation in a computer laboratory.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
The student knows the typical applications of data warehouse in e-business		• a multiple choice and open questions test	• Lecture
The student understands the need to constantly supplement and expand his/her knowledge in the field of data warehouses		• a preparation of a project • a preparation of a research paper	• Project

Outcome description	Outcomesymbols	Methods of verification	The class form
The student knows the technologies and software tools that can be used to design and implement a data warehouse		• a multiple choice and open questions test	• Lecture
The student is able to determine the possibilities of application of data warehouse in the enterprise		• a preparation of a research paper • an observation and evaluation of the student's practical skills	• Laboratory
The student knows the components of the data warehouse		• a multiple choice and open questions test	• Lecture
The student is able to prepare a report based on multidimensional data structures		• a test with score scale • an observation and evaluation of activities during the classes • an observation and evaluation of the student's practical skills	• Laboratory
The student is able to deploy the data warehouse		• a test with score scale • an observation and evaluation of activities during the classes • an observation and evaluation of the student's practical skills	• Laboratory
The student knows the methods of data warehouse design		• a multiple choice and open questions test	• Lecture
The student knows the technologies used to prepare reports		• a multiple choice and open questions test	• Lecture
The student is able to prepare a data warehouse project		• a preparation of a project	• Project
The student knows how to work in a team implementing a data warehouse project		• a preparation of a project • an observation and evaluation of the student's practical skills	• Project
The student can administer the data warehouse		• a test with score scale • an observation and evaluation of activities during the classes • an observation and evaluation of the student's practical skills	• Laboratory

Assignment conditions

Lecture - the passing criteria is to obtain positive grades from tests carried out at least once in a semester.

Laboratory - the passing criterion is to obtain positive marks for laboratory exercises and tests.

Project - positive assessment of the project or projects realized during the semester

Final mark components = lecture: 30% + teaching laboratory: 40% + project: 30%

Recommended reading

1. SQL Server 2012 Tutorials: Analysis Services - Multidimensional Modeling SQL Server 2012 Books Online, Microsoft, 2012
2. Sarka D., Lah M. Jerkic, Implementing a Data Warehouse with Microsoft SQL Server 2012, O'Reilly, 2012
3. Serra J., Anton B., Reporting with Microsoft SQL Server 2012, Packt Publishing, 2014
4. Kimball, R., Ross, M.: The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling (Second Edition), Wiley, 2002
5. Inmon W.H.: Building the Data Warehouse, Wiley, 2005
6. Corr L., Stagnitto J.: Agile Data Warehouse Design: Collaborative Dimensional Modeling, from Whiteboard to Star Schema, DecisionOne Press, 2011

Further reading

Notes

Modified by dr hab. inż. Marek Kowal, prof. UZ (last modification: 12-07-2021 11:41)