DECISION SUPPORT SYSTEMS

Degree in Computer Systems

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Code: 10702

Main Scientific Area: Information Systems and Artificial Intelligence

Lecturer: Joaquim Gonçalves Pereira da Silva

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 60h Total Workload: 100h

ECTS: 6,0

Objectives

This course will address the fundamental concepts related to decision support systems, providing students with knowledge about the techniques, methods and tools necessary for the development and deployment of these systems, such as dimensional modeling, ETL processes, analytical repositories, analytical processing and tools for data exploration and visualization.

The aim is to present the context of application of decision support systems, the various components that can constitute them and the type of problems they can help to solve. In order to demonstrate the applicability of decision support systems, projects will be developed to support decision making or solve related problems by using tools specific to this area.

Learning Outcomes

At the end of the course unit the students should be able to:

Explain the fundamental concepts and the application of decision support systems;
Perform the analysis and modeling of an analytical repository;
Implement an analytical repository and its process of data refresh (ETL);
Perform data preparation and develop solutions for data analysis and visualization.

Course Contents

1. Decision Support Systems (DSS)
— Decision making
— DSS architecture
— Star schema

2. Dimensional design
— Data warehouse lifecycle
— Dimensional design
— ETL process

3. Analytical processing
— Data analytics engines

— Tabular Model
— DAX Language

4. Data visualization and exploration
— Data exploration tools
— Data preparation
— Data visualization

Recommended Bibliography

Adamson, C. (2010). Star Schema The Complete Reference, McGraw-Hill (ISBN-13: 978-0071744324)Ferrari, A., Russo, M. (2019). The Definitive Guide to DAX: Business Intelligence with Microsoft Excel, SQL Server Analysis Services, and Power BI. 2nd Edition, Microsoft Press (ISBN-13: 978-1509306978).Kimball, R., Ross, M. (2013). The data warehouse toolkit: The definitive guide to dimensional modeling. John Wiley Son

Learning and Teaching Methods

The course program introduces students to key concepts in understanding the scope and context of Decision Support Systems (DSS) implementation and operation. To develop competencies in this field, students should fully understand the concepts of decision support systems, know the best practices of dimensional modeling, understand the importance and characteristics of the ETL process within the DSS context, and learn to develop business analytics (BA) solutions, from data preparation to visualization solutions.

Assessment Methods

Learning outcomes will be evaluated by theoretical and practical components. The students will execute an individual written test. The practical component, consisting of the development of two projects, will be carried out by student teams during the class period with lecturer guidance. The theoretical component grade results from the written test grade. The final grade (FG) is a weighted average calculated according to the expression:

FG = Theoretical Component * 40% + Project01 * 30% + Project02 * 30%

The evaluation of the practical component includes an individual defense session of the projects, and the grade is assigned individually to each element of the working group. Successful completion of the curricular unit is subject to obtaining a minimum score of 8.0 in the theoretical component. Only the theoretical component is assessed in exams for approval or improvement of grades, keeping the grade of the practical component in the calculation of the FG.