GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Data warehouses, PG_00068355		
Field of study	Data Engineering, Data Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	blended-learning
Year of study	3	Language of instruction	English
Semester of study	5	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Software Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Teresa Zawadzka	
	Teachers	dr inż. Teresa Zawadzka	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45
E-learning hours included: 13.0						

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	4.0	26.0	75

Subject objectives

The aim of the course is introduction the student to data warehouse concepts, to applications and design of data warehouses, as well as to methods of querying a data warehouse. The student also gets knowledge how to use business *inteligence tools*.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] develops innovative solutions for data analysis and processing, using appropriate methods and tools	The student designs Business Intelligence solutions based on Ralph Kimball's architecture.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K6_K03] demonstrates the ability to think critically and analytically and integrates knowledge from many disciplines in order to make effective decisions	The student can analyze business processes to provide Business Intelligence solutions. In addition, the student can analyze data generated during the execution of business processes to determine their completeness for business analyses.	[SK5] Assessment of ability to solve problems that arise in practice
[K6_W05] integrates data from multiple sources in order to analyze complex business problems	The student can design and implement ETL (Extract, Transform, and Load) processes for data warehouses from data sources with various structures.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

<table>
<tr><td>Subject contents</td><td>Course content – lecture
1. Basic concepts of data warehousing

2. Multi-dimensional data model in data warehouses. Categorical and hierarchical dimensions.

3. The star schema and the snowflake schema. Constelation schema.

4. Basic operations on OLAP cubes.

5. Memory models in data warehouses

6. The architecture of business intelligent solutions.

7. The rules for creating a data warehouse.

8. MDX language simple and advanced queries

9. ETL (Extract, Transform, Load) processes

10. Reporting systems

Course content – laboratory
1. Practical presentation of topics covered in the lecture.

2. Design and implementation of a BI system.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic database course completed</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>lab</td><td>50.0%</td><td>50.0%</td></tr><tr><td>exam</td><td>50.0%</td><td>50.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>W.H. Inmon: Building the Data Warehouse. J. Wiley&Sons,

R. Kimball: Data Warehouse Toolkit. J. Wiley&Sons,

P. Ponniah: Data Warehousing. J. Wiley&Sons, .

K. Goczyła. T. Zawadzka. "Data Warehousies". Lecture materials.</td></tr><tr><td>Supplementary literature</td><td>None</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
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Example issues/ example questions/ tasks being completed	1. Design a data warehouse according to guidelines specified 2 Develop a data warehouse and test its functioning 3. Explain the differences between OLAP and OLTP processing 4. Specify the most important features of a data warehouse 5. What is the difference from the star schema and the snowflake schema? 6. Explain extensions of SQL for OLAP processing. 7. What is the ETL process?
Practical activites within the subject	Not applicable

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