GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Data warehouses, PG_00045309					
Field of study	Data Engineering					
Date of commencement of studies	October 2022		Academic year of realisation of subject		2023/2024	
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	2		Language of instruction		English	
Semester of study	4		ECTS credits		4.0	
Learning profile	general academic profile		Assessment form		exam	
Conducting unit	Department of Software Engineering -> Faculty of Electronics, Telecommunications and Informatics					
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Teresa Zawadzka			
	Teachers		dr inż. Teresa Zawadzka			

Lesson types and methods of instruction	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	8.0	47.0	100

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_U06] Independently solves complex engineering tasks using literature, materials and devices, prepares extensive documentation of the developed solution using appropriate description techniques.	Student can use basic business intelligence tools, in particular those included in standard commercial software packages for data warehousing.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K6_W08] Knows the models and structure of the data mining process and their multidimensional analysis and can assess the results of such analyses	The student knows and can use data models used in data warehousing and knows how to build data warehouses that comply with these models.	[SW1] Assessment of factual knowledge
	[K6_W16] Knows the quality attributes of data in information systems and the principles of data management and usage that ensure the level of data quality required for specific applications	Student knows data quality problems occuring in the data integration processes	[SW1] Assessment of factual knowledge

Subject contents	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. Mixed schemes.
	4. Basic operations on OLAP cubes.
	5. Memory models in data warehouses
	6. The logical and physical architecture of a data warehouse
	7. The rules for creating a data warehouse.
	8. Applications of data warehouse - Examples.
	9. Review of available commercial OLAP servers
	10. MDX language an review
	11. MDX simple queries
	12. MDX advanced queries
	13. Extensions of SQL - operations on OLAP cubes
	14. ETL (Extract, Transform, Load) processes
	15. Planning for a data warehouse in an enterprise

Prerequisites and co-requisites	Basic database course completed

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab	50.0%	50.0%
	exam	50.0%	50.0%

Recommended reading	Basic literature	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 Warehousing". Lecture materials.
		V. Poe, P. Klauer, S. Brebst: Tworzenie hurtowni danych, WNT
	Supplementary literature	None
	eResources addresses	Adresy na platformie eNauczanie: Data Warehouses DE 2023/2024 - Moodle ID: 36300 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36300

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?
Work placement	Not applicable