GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Nonrelational databases, PG_00045311		
Field of study	Data Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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	Polish
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		
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	15.0	0.0	60
E-learning hours included: 15.0						

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	60	5.0	10.0	75

Subject objectives

The main goal is to introduce theoretical issues of NoSQL databases. Moreover, four types of NoSQL databases are presented. After this course students should be acknowledged with MongoDB, HBase, Oracle NoSQL and Neo4J.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] analyses problems and creates appropriate models, data structures and algorithms (including heuristic and numerical ones), assesses their computational complexity, estimates errors of the received solutions	During the course students learn how to choose the appropriate database for specific business applications.	[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_W04] Knows the architecture of computers, operating system processes, file systems, text processing programs, disk and ram memories management rules. Knows the problems of sharing the state, presentation and transformation of information in a distributed system, hypermedia technologies and related services, the architecture of interactive distributed simulation and agent interaction methods.	During the course students learn models of data distribution: shardingu and replication, and CAP and BASE theory.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K6_W07] Knows the methods of information processing, storage, extraction of data stored in various models including: relational, graph and document ones	During the course students become familiar with NoSQL data models: documents, graphs, column-oriented data types and key-value data structures.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents	1. Introduction to NoSQL databases - types of NoSQL databases - introduction to distributed databases - CAP - BASE 2. Document database - MongoDB 3. Hadoop, MapReduce and HBase as a column-oriented database 4. Key-value databases - Oracle NoSQL 5. Graph databases - Neo4J
Prerequisites and co-requisites	1. Knowledge of relational modeling 2. Very good knowledge of SQL language 3. Knowledge of OLTP
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
project development	50.0%	35.0%
tasks during laboratoies	50.0%	35.0%
exam	50.0%	30.0%

Recommended reading	Basic literature	1. Professional NoSQL, Shashanki Tiwari, Wiley, 2011. 2. MongDB, The Definitive Guide, Kristina Chodorow, O'Reilly, 2013 3. Graph Databases: New Opportunities for Connected Data, Ian Robinson and Jim Webber, O'Reilly 2015.
	Supplementary literature	Documentation of NoSQL databases.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Model NoSQL database (of any type) 2. Define and execute queries	
Work placement	Not applicable	