GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Non-Relational Databases, PG_00047966		
Field of study	Informatics		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group 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	4	Language of instruction	Polish
Semester of study	7	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. Grzegorz Gołaszewski	
	Teachers	dr inż. Grzegorz Gołaszewski 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: 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	45	4.0	51.0	100

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

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W42] Knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human cooperation with computers and computer-aided teamwork	As part of the course, students will learn about NoSQL data processing models: documents, graphs, and key-value data structures.	[SW1] Assessment of factual knowledge
[K6_W41] Knows and understands, to an advanced extent, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining	During the course students learn models of data distribution: shardingu and replication, and CAP and BASE theory.	[SW1] Assessment of factual knowledge
[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	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 [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K6_U41] can produce, test or evaluate software using modern programming platforms, tools, languages and paradigms of different levels, as well as use software packages supporting scientific and research processes as well as business decision-making processes and teamwork	The student is able to assess the database design by checking the feasibility of queries.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment

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 - Redis

5. Graph databases - Neo4J

Prerequisites and co-requisites

1. Knowledge of relational modeling

2. Very good knowledge of SQL language

3. Knowledge of OLTP

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Workshop tasks</td><td>50.0%</td><td>80.0%</td></tr>
<tr><td>Exam</td><td>50.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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.</td></tr>
<tr><td>Supplementary literature</td><td>Documentation of NoSQL databases.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Non-relational Databases 2023/2024 - Moodle ID: 30891
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30891</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Model NoSQL database (of any type)

2. Define and execute queries

3. Simulate distribution of data</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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