



## 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: sharding 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	<p>1. Introduction to NoSQL databases</p> <ul style="list-style-type: none"> <li>- types of NoSQL databases</li> <li>- introduction to distributed databases</li> <li>- CAP</li> <li>- BASE</li> </ul> <p>2. Document database - MongoDB</p> <p>3. Hadoop, MapReduce and HBase as a column-oriented database</p> <p>4. Key-value databases - Oracle NoSQL</p> <p>5. Graph databases - Neo4J</p>														
Prerequisites and co-requisites	<p>1. Knowledge of relational modeling</p> <p>2. Very good knowledge of SQL language</p> <p>3. Knowledge of OLTP</p>														
Assessment methods and criteria	<table border="1" data-bbox="451 1037 1487 1171"> <thead> <tr> <th data-bbox="451 1037 794 1070">Subject passing criteria</th> <th data-bbox="794 1037 1137 1070">Passing threshold</th> <th data-bbox="1137 1037 1487 1070">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 1070 794 1104">project development</td> <td data-bbox="794 1070 1137 1104">50.0%</td> <td data-bbox="1137 1070 1487 1104">35.0%</td> </tr> <tr> <td data-bbox="451 1104 794 1137">tasks during laboratoies</td> <td data-bbox="794 1104 1137 1137">50.0%</td> <td data-bbox="1137 1104 1487 1137">35.0%</td> </tr> <tr> <td data-bbox="451 1137 794 1171">exam</td> <td data-bbox="794 1137 1137 1171">50.0%</td> <td data-bbox="1137 1137 1487 1171">30.0%</td> </tr> </tbody> </table>			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%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>1. Professional NoSQL, Shashanki Tiwari, Wiley, 2011.</p> <p>2. MongoDB, The Definitive Guide, Kristina Chodorow, O'Reilly, 2013</p> <p>3. Graph Databases: New Opportunities for Connected Data, Ian Robinson and Jim Webber, O'Reilly 2015.</p> <p>Documentation of NoSQL databases.</p> <p>Adresy na platformie eNauczanie:</p>													
Example issues/ example questions/ tasks being completed	<p>1. Model NoSQL database (of any type)</p> <p>2. Define and execute queries</p>														
Work placement	Not applicable														