

Subject card

Subject name and code	NoSQL Databases, PG_00209694						
Field of study	Mathematics						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		English		
Semester of study	2		ECTS credits		5.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Rafał Lutowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
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		3.0		62.0	125
Subject objectives	Familiarizing students with the following topics: • basic types of non-relational databases; • application areas of different database models; • sample NoSQL database products; • differences between non-relational databases; • differences between non-relational data models and the relational model.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[MATMU2_W01] knows and understands in depth the theory of selected areas of mathematics or related fields, the complex relationships between them and their development trends		The student has an in-depth understanding of the mathematical foundations of non-relational database models (in particular, graph structures, set theory, and data algebras) and can apply this knowledge in the analysis and design of data storage systems.		[SW4] test/exam - oral or written [SW2] presentation/project/paper/report		
	[MATMU2_U05] is able to apply new or adapt existing methods and tools from a selected field of mathematics and information and communication technologies in related fields		The student is able to apply and communicate (orally and in writing) methods of selected non-relational database models at an advanced level, including their mathematical foundations.		[SU2] presentation/project/paper/report		
Subject contents	1. Basic properties of the relational model and the origins of NoSQL. 2. Additional modules for working with text data in relational databases. 3. CAP theorem. 4. Basic types of non-relational databases and their application areas. 5. Discussion of selected non-relational databases.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	homeworks	80.0%	30.0%
	test	50.0%	40.0%
	presentation	50.0%	30.0%
Recommended reading	Basic literature	1. G. Harrison, Next generation databases, Apress Berkeley, CA, 2015 2. P. Lake, P. Crowther, Concise Guide to Databases, Springer London, 2013 3. A. Meier, M. Kaufmann, SQL & NoSQL Databases, Springer Vieweg Wiesbaden, 2019 4. L. Perkins, E. Redmond, R. Wilson, Seven databases in seven weeks, Pragmatic Bookshelf, 2018	
	Supplementary literature	n/a	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Explain NRW notation and its impact on consistency and availability. 2. List the nonrelational database models and point out the differences between them. 3. Explain the reasons for choosing a specific data model and present the steps for creating and working with a database.		
Work placement	Not applicable		

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