University of Gdańsk

Subject card

Subject name and code	NoSQL Solutions, PG_00178486		
Field of study	Informatics and Econometrics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study
Mode of study	part-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	5.0
Learning profile	academic	Assessment form	credit
Conducting unit	Department of Business Informatics -> Faculty of Management -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Patrycja Krauze-Maślankowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	8.0	0.0	24.0	0.0	0.0	32

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	32	2.0	91.0	125

Subject objectives

familiarizing students with the principles of designing non-relational databases,preparing students to use a non-relational database management system,preparing students to write software that uses unstructured databases.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[IiEL3_W05] Knows and understands the methods, techniques and informatics or statistics tools used to acquire, collect, process and present data in decision-making processes	Possesses knowledge of existing non-relational database technologies and is able to align them with specific user needs. Knows how to match the appropriate type of non-relational database to solve a given problem and understands classifications related to diverse non-relational database technologies.	[SW4] test/exam - oral or written
[IiEL3_U12] Can design and implement IT systems to enhance business operations and effectively utilize modern ICT technologies for management and business communication	Is able to establishe new databases with collections of unstructured documents. Is able to write advanced scripts to explore data from nonrelational databases. Is able to write software that uses nonrelational databases.	[SU2] presentation/project/paper/ report
[IiEL3_U03] Can obtain data from appropriately selected sources, use these data to solve economic and social problems, and process and interpret them using econometrics, informatics or statistics tools	Is able to ensure data security in databases, particularly regarding personal data protection and database security. Is able to demonstrate creativity in selecting database technologies for applications in business and administrative organizations.	[SU2] presentation/project/paper/ report

Subject contents

Introduction to Non-Relational Databases (1h)

Document, Graph, Key-Value and Columnar Databases (2h)

Non-Relational Database Models and Software Overview (3h)

Create, Select, Update and Delete Commands (3h)

Big Data Solutions for Non-Relational Databases Machine Learning, Data Classification, Web Scraping (6h)Database Creation, JSON Document Structure and Characteristics (2h)

Collection and Document Creation Instructions, Data Field Definition, Data Types (2h)

Nested Documents, Document Indexing (2h)

Importing and Exporting Data Between Relational, Non-Relational and Semi-Structured Systems and Internet Data Sources Web Scraping and Social Media (4h)

Data Quality Aspects in Non-Relational Databases Data from Websites, Social Media and Data Deduplication (2h)

Content Classification in Non-Relational Databases (3h)

Using Big Data solutions in non-relational databases - case studies including web scraping, social media, machine learning (30h)

Prerequisites and co-requisites

Knowledge of how relational databases or spreadsheets work.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquium - problem solving	51.0%	40.0%
Lecture knowledge test	51.0%	40.0%
project - database system	51.0%	20.0%

Recommended reading	Basic literature	1. Wrycza S., Maślankowski J. (red.) Informatyka ekonomiczna. Teoria i zastosowania., PWN, 2019 (rozdział Bazy danych. Big Data.) 2. Guy H., NoSQL, NewSQL i BigData. Bazy danych następnej generacji, Helion, 2019 3. Materials on PE UG: http://pe.ug.edu.pl.
	Supplementary literature	1. Documentation MongoDB (http://mongodb.com) 2. Documentation ElasticSearch (https://www.elastic.co/guide/index.html) 3. Documentation Python (http://python.org) 4. Documentation Java (https://docs.oracle.com/en/java/) **5**. Bierer D., Learn MongoDB 4.x: A guide to understanding MongoDB development and administration for NoSQL developers, Packt Publishing, 2020 6. Sadalage P.J., Fowler M., NoSQL. Kompendium wiedzy, Helion, 2015 7. Sullivan D., NoSQL. Przyjazny przewodnik, Helion, 2015
	eResources addresses	
Example issues/ example questions/ tasks being completed	List the types of non-relational databasesWhat architecture is used in non-relational database systems	
Work placement	Not applicable	

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