GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	BigData and data exploration, PG_00062739		
Field of study	Technologies for Industry 5.0		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Functional Materials Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Milena Marycz	
	Teachers		

Lesson types

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: 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	45	5.0	50.0	100

Subject objectives

Presentation of the essence of data exploration and its applications. Discussion of basic data mining techniques. Demonstration of selected data mining algorithms and their application in specific examples.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U05] interprets phenomena occurring around the technological process and processes occurring in the life cycle of devices and systems, makes a critical assessment of the functioning of existing solutions	As a result of the learning process, the student acquires the ability to use selected data mining tools and to interpret the results obtained.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_W06] demonstrates knowledge related to data analysis and engineering, machine learning, knows the principles of integrating data with management systems to analyze complex engineering and technological problems	As a result of the learning process, the student acquires knowledge in the field of modern data mining methods and mathematical models related to data mining. The student is able to characterize techniques, methods, and tools for advanced data analysis.	[SW1] Assessment of factual knowledge

Subject contents	Course content – lecture 1. Introduction to Big Data and large-scale data processing technologies. 2. Data storage and management. 3. Introduction to data mining. 4. Data cleaning and preprocessing. 5. Issues related to real-world data analysis. 6. Data clustering and classification. 7. Classification methods (Naive Bayes, decision trees). 8. Selected clustering methods. 9. Time series forecasting. 10. Recommender systems. 11. Data mining in Python. 12. Decision support systems. 13. Ethics and privacy in data mining. 14. Big Data and data mining use cases.
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
	60.0%	50.0%
	60.0%	50.0%

Recommended reading	Basic literature	Larose, Daniel T., Data Mining: A Practical Guide to Knowledge Discovery, Wydawnictwo Naukowe PWN, Warsaw, 2007. Morzy, Tadeusz, Data Exploration, PWN, Warsaw, 2013. Hand, D., Mannila, H., & Smyth, P., Data Mining, WNT, Warsaw, 2005.

	Supplementary literature	Larose, Daniel T., Data Mining Methods and Models, Wydawnictwo Naukowe PWN, Warsaw, 2007. Witten, Ian H., Frank, Eibe, Hall, Mark A., Data Mining: Practical Machine Learning Tools and Techniques, Third Edition, Warsaw, 2024.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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