



Subject card

Subject name and code	, PG_00052288						
Field of study	Mathematics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	second-cycle studies	Subject group			Specialty subject group 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	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Applied Mathematics -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Styborski					
	Teachers	dr inż. Marcin Styborski					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	45.0	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		5.0		35.0	100
Subject objectives	The aim of the course is to familiarize students with the methods used in the daily practice of the LPP Data Science team and practical training.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	<p>[K7_U09] constructs mathematical models used in specific advanced applications of mathematics, can use stochastic processes as a tool for modeling phenomena and analyzing their evolution, constructs mathematical models used in specific advanced applications of mathematics, uses stochastic processes as a tool for modeling phenomena and analyzing their evolution, recognizes mathematical structures in physical theories</p>	<p>The student knows what machine learning is. He knows its types and the process of creating. The student works with data warehouses and uses them for mathematical modeling.</p>	<p>[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task</p>
	<p>[K7_U10] understands the mathematical foundations of the analysis of algorithms and computational processes, constructs algorithms with good numerical properties, used to solve typical and unusual mathematical problems</p>	<p>The student uses SQL and Python in practice to solve specific problems in business</p>	<p>[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfillment</p>
	<p>[K7_W02] has enhanced knowledge of a selected branch of mathematics, theoretical or applied, knows classical definitions and theorems and their proofs and connections with other fields, understands problems being examined</p>	<p>The student performs tasks related to machine learning. The student is able to work with data warehouses.</p>	<p>[SW3] Assessment of knowledge contained in written work and projects</p>
	<p>[K7_K03] works as a team; understands the necessity of systematic work on all projects that are long-term in nature, understands and appreciates the importance of intellectual honesty in one's own activities and the activities of other people; behaves ethically</p>	<p>The student performs a specific project task in a group, which ends with its explanation and visualization. As a result, he learns teamwork, regularity and responsibility for the entrusted component task.</p>	<p>[SK1] Assessment of group work skills [SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice</p>
<p>Subject contents</p>	<p>Course content – lecture</p> <p>LPP business</p> <ul style="list-style-type: none"> • Business processes and supply chain • Data Science in the organization • Roles in the Data Science team <p>Business Intelligence and Cubes</p> <ul style="list-style-type: none"> • Data warehouses • Data modeling • OLAP and tabular cubes <p>SQL</p> <ul style="list-style-type: none"> • Introduction to SQL • Tables, partitions, clustered and non-clustered indexes, or how the database holds the data • Data reading and performance <p>Data Science in practice</p> <ul style="list-style-type: none"> • Machine learning in business • Types of machine learning models and the development process • Basic metrics used in machine learning models • Interpreting the results of machine learning models <p>SCRUM</p> <ul style="list-style-type: none"> • Explanation of the Scrum framework • Roles, artifacts, events • Scrum Tale simulation game 		

Prerequisites and co-requisites	Basic knowledge of Python and SQL. Basic knowledge of probability and statistics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project implementation (30 points)	50.5%	30.0%
	Project execution in classes (10 weeks * 5 points)	50.5%	50.0%
	Class attendance and active participation in lectures (5 weeks * 4 points)	50.5%	20.0%
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition (Springer Series in Statistics) 2nd Edition Trevor Hastie, Robert Tibshirani, Jerome Friedman 2. Probabilistic Machine Learning: An Introduction Kevin Patrick Murphy. MIT Press, 2021. 3. Python. Machine learning i deep learning. Biblioteki scikit-learn i TensorFlow 2. Wydanie III, Sebastian Raschka, Vahid Mirjalili, Helion 2021 4. Zapytania w SQL. Przyjazny przewodnik. Wydanie IV, John L. Viescas, Helion 2021 	
	Supplementary literature	<ol style="list-style-type: none"> 1. Python w analizie danych. Przetwarzanie danych za pomocą pakietów pandas i numpy oraz środowiska ipython. Wydanie II, Wes McKinney, Wydawnictwo Helion 2. Uczenie maszynowe z użyciem Scikit-Learn. Aurelion Geron, Wydawnictwo Helion 3. Hurtownie danych. Od przetwarzania analitycznego do raportowania. Wydanie II, Adam Pelikant, Helion 2021 	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Work in the design laboratory billed in weekly incremental cycles in accordance with the Scrum framework. Timely delivery of weekly gains from project implementation in accordance with the developed Road Map. Verification will take place during review at each classes. Finally, a team presentation of the results obtained.		
Practical activities within the subject	Not applicable		

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