GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00052288						
Field of study	Mathematics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
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	Instytut Matematyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Marcin Styborski				
	Teachers						
Lesson types and methods of instruction	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 Sience team and practical training.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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		
[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		
[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		
[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		

Subject contents

LPP business

- Business processes and supply chain
- Data Science in the organization
- Roles in the Data Science team

Business Intelligence and Cubes

- Data warehouses
- Data modeling
- OLAP and tabular cubes

SQL

- Introduction to SQL
- Tables, partitions, clustered and non-clustered indexes, or how the database holds the data
- Data reading and performance

Data Science in practice

- 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

SCRUM

- Explanation of the Scrum framework
- Roles, artifacts, events
- Scrum Tale simulation game

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic knowledge of Python and SQL. Basic knowledge of probability and statistics.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project implementation (30 points)</td><td>50.5%</td><td>30.0%</td></tr>
<tr><td>Project execution in classes (10 weeks * 5 points)</td><td>50.5%</td><td>50.0%</td></tr>
<tr><td>Class attendance and active participation in lectures (5 weeks * 4 points)</td><td>50.5%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">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</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">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</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">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.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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