GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Graph Data Presentations, PG_00044134		
Field of study	Mathematics		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	blended-learning
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Probability Theory and Biomathematics -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Magdalena Lemańska	
	Teachers	dr inż. Magdalena Lemańska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	15.0	0.0	60

E-learning hours included: 3.0

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	60.0	125

Subject objectives

The aim of the course is to familiarize students with the methods of data presentation using graph theory.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U10	Student is able to make some proofs concerning graph theory using induction. He is able to write a given algorithm in various programming languages.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
K7_W06	The student is able to use various programs (for example R) and the modules built into them, and program using the aforementioned tools.	[SW1] Assessment of factual knowledge
K7_K02	The student is able to work in a group and exchange necessary information with other students.	[SK4] Assessment of communication skills, including language correctness
K7_U09	Student knows the basic graph algorithms and is able to use them. He can model some phenomena using Petri nets. He knows the different types of trees used in computer science. Can present data using planar graphs.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools

Subject contents	1. How to save a graph in computer memory? 2. Basic graph algorithms: Dijkstra albgorithm, Floyd- Warshall algoritm, algorithms of flow in networks, traveling salesman problem, the problem of Chinese postman 3. Petri nets. 4 Graph isomorphism 5. Planar graphs 6. Dofferent types of trees and their properties (spanning trees, decision trees, binary trees, arithmetics trees, algorithms concernig tres)
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final test	50.0%	34.0%
Laboratory	50.0%	33.0%
Project	50.0%	33.0%

Recommended reading

Basic literature	Geir Agnarsson, Raymond Greenlaw, Graph Theory: Modelling, Applications and Algotithms, Pearson Education Inc, 2007 Wolfgang Reisig, Sici Petriego, WNT, 1988 Jacek Wojciechjowski, Krzysztof Pieńkosz, Grafy i sieci, PWN 2013
Supplementary literature	Peter H. Starke, Sieci Petri, PWN 1987 Seymour Lipschitz, Marc Lipson, Discrete Mathematics, Schaum's Outlines, 1997
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Find the minimum cut and the maximum flow in a given network. Apply the Dijkstra (Floyd Warshall) algorithm to a given graph. Prove that each planar graph can be colored with five colors. Decide whether graphs are isomorphic. Find the reachibility graph for a given Petri net.
Work placement	Not applicable