



## Subject card

Subject name and code	Discrete Mathematics, PG_00058928						
Field of study	Informatics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2023/2024		
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	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Paweł Obszarski					
	Teachers	dr Paweł Obszarski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30	4.0		66.0		100
Subject objectives	Getting familiar with the mathematical notation and techniques useful in discrete optimization.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_K02] is ready to critically assess possessed knowledge and acknowledge the importance of knowledge in solving cognitive and practical problems	Learns about numerous mathematical models and their practical applications.			[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work		
	[K6_W41] Knows and understands, to an advanced extent, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining	Knows elements of combinatorics and graph theory crucial in big data analysis.			[SW1] Assessment of factual knowledge		
	[K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Learns about numerous algorithmic aspects of set theory, combinatorics and graph theory			[SW1] Assessment of factual knowledge		
	[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	Knows how to use in practice knowledge from graph theory, set theory and other			[SU4] Assessment of ability to use methods and tools		

Subject contents	Algebra of sets		
	Logic: tautologies, predicates		
	Mathematical induction		
	Binary relations: equivalence relation, equivalence classes		
	Binary relations: partial order, Hasse diagrams		
	Binary relations: transitive closure, equivalence closure		
	Counting: functions, configurations, partitions,		
	Graph Theory: notation, basic terms		
	Graph Theory: Eulerian graphs, Chinese Postman Problem		
	Graph Theory: Hamiltonian graphs, Traveling Salesman Problem		
	Graph Theory: properties of trees		
	Graph Theory: planarity		
	Graph coloring		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written exam	51.0%	100.0%
Recommended reading	Basic literature	[1] K. A. Ross, C. R. B. Wright, <i>Matematyka dyskretna</i> , PWN, Warszawa 1996. [2] R. L. Graham, D. E. Knuth, O. Patashnik, <i>Matematyka konkretna</i> , PWN, Warszawa 1996. [3] W. Lipski, W. Marek, <i>Analiza kombinatoryczna</i> , PWN, Warszawa 1986. [4] H. Rasiowa, <i>Wstęp do matematyki współczesnej</i> , PWN, Warszawa 1984. [5] Robin J. Wilson, <i>Wprowadzenie do teorii grafów</i> , PWN, Warszawa 2000.	
	Supplementary literature	No requirements	
	eResources addresses	Adresy na platformie eNauczanie: Matematyka Dyskretna 2023/24 - Moodle ID: 32729 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32729">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32729</a>	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		