

Subject card

Subject name and code	Discrete Mathematics, PG_00189374						
Field of study	Mathematical Modeling and Data Analysis						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's 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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		5.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Ewa Tyszkowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	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		3.0		62.0	125
Subject objectives	The aim of the course is to familiarize students with general methods of discrete mathematics, that is, mathematics dealing with finite (or at most countable) structures, and to develop the skills of abstract thinking and understanding problems in discrete mathematics. These skills are necessary for studying most branches of mathematics.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[MMiADL3_W05] knows and understands the structure of selected mathematical theories, is able to use mathematical formalism to build and analyze mathematical models also in other fields of science		The student knows and understands the elements of discrete mathematics that can be applied to the analysis of mathematical problems encountered in other fields of science.		[SW1] oral statement/conversation/discussion		
	[MMiADL3_U05] is able to plan a way to solve a complex problem and prepare a correct record of this solution, providing strict and precise justification for the correctness of his/her reasoning		The student is able to solveproblems from the discussed areas of discrete mathematics, can justify their reasoning, and write the solution using mathematical symbols correctly.		[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written		

Subject contents	1. Elements of combinatorics: counting and generating combinatorial objects (sequences, permutations, subsets). 2. Arithmetic: counting systems. 3. Boolean algebras: Boolean functions, Boolean expressions. 4. Elements of number theory: divisibility of numbers, Euclid's algorithm. Application of number theory in cryptography. 5. Simple data structures. Lists, stacks, queues, trees, binary trees, arithmetic expression trees. 6. Recursion: recursive functions, methods of solving recursive equations. 7. Elements of graph theory: trees, graph isomorphism, Eulerian graphs and Hamiltonian graphs.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Tests, homework, activity	51.0%	50.0%
	written exam	51.0%	50.0%
Recommended reading	Basic literature	1. Andrzej Szepietowski, Matematyka dyskretna, Wyd. UG 2004. 2. Kenneth A. Ross, Charles R.B. Wright, Matematyka Dyskretna, Wydawnictwo Naukowe PWN, 1996. 3. Hanna Furmańczyk, Karol Horodecki, Paweł Żyliński, Matematyka dyskretna dla studentów kierunku Informatyka, Wydawnictwo Uniwersytetu Gdańskiego, 2010.	
	Supplementary literature	not required	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Assignments are presented in the script Discrete Mathematics for students of Computer Science		
Work placement	Not applicable		

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