

Subject card

Subject name and code	Discrete Mathematics, PG_00155246						
Field of study	Mathematical Modeling and Data Analysis						
Date of commencement of studies	October 2024		Academic year of realisation of subject			2024/2025	
Education level	Bachelor's studies		Subject group			Obligatory subject group 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 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		dr Nikodem Mrozek				
			dr hab. Ewa Tyszkowska				
			dr Paweł Klinga				
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		5.0		60.0	125
Subject objectives	The aim of the course is to acquaint students with general methods of discrete mathematics dealing with countable structures and develop the understanding of abstract problems resulting from discrete mathematics. These skills are needed to study many fields of mathematics.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[MMiADL3_W01] knows the basic concepts, methods and theorems of mathematical logic and set theory	The student knows the basics of discrete mathematics: knows basic algorithms in the field of: arithmetic in number systems with various bases, number theory, combinatorics and graph theory; knows selected data encryption methods; knows the concept of recursiveness, knows basic recursive algorithms; knows basic reasoning methods.	[SW4] test/exam - oral or written
	[MMiADL3_K09] is ready to critically evaluate arguments, find gaps in reasoning, and constructively criticise other people's reasoning	jest gotów do krytycznej oceny argumentów, znajdowania luk w rozumowaniach i konstruktywnej krytyki w stosunku do rozumowań innych osób	[SK1] oral statement/conversation/discussion
	[MMiADL3_K06] is ready to formulate opinions on basic mathematical issues	can form opinions on basic mathematical issues	[SK1] oral statement/conversation/discussion
	[MMiADL3_K02] is ready to precisely formulate questions to deepen his/her own understanding of a given topic or to find missing elements of reasoning	can precisely formulate questions to deepen one's understanding of a given topic or find missing elements of reasoning	[SK1] oral statement/conversation/discussion
	[MMiADL3_K01] is ready to accept the limitations of his/her own knowledge and understands the need for further education	knows the limitations of his own knowledge and understands the need for further education	[SK8] observation of student's independent or team work
	[MMiADL3_U01] correctly uses the learned concepts of mathematical logic and set theory	correctly uses the concepts of mathematical logic and set theory	[SU4] test/exam - oral or written
	[MMiADL3_K04] is ready to understand and appreciate the importance of intellectual honesty in own and other people's actions; is ready to act ethically	understands and appreciates the importance of intellectual honesty in one's own and other people's actions; acts ethically	[SK8] observation of student's independent or team work
Subject contents	1. Elements of logic and set theory: calculus of logical sentences,, equivalence relation, orders. 2. Elements of combinatorics: counting and generating combinatorial objects (sequences, permutations, subsets). 3. Arithmetic: counting systems.4.Boolean algebras: Boolean functions, Boolean expressions.5. Elements of number theory: divisibility of numbers, Euclid's algorithm. Application of number theory in cryptography.6. Simple data structures. Lists, stacks, queues, trees, binary trees, arithmetic expression trees. 7. Recursion: recursive functions, methods of solving recursive equations.8. Elements of graph theory: trees, graph isomorphism, Eulerian graphs and Hamiltonian graphs.		
Prerequisites and co-requisites	not required		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment of exercises based on: test results, results obtained from homework, activity in classes.	50.0%	40.0%
	Lecture grade: written exam result	50.0%	60.0%
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			
Work placement	Not applicable		

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