

Subject card

Subject name and code	Discrete Mathematics, PG_00143828						
Field of study	Informatics						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
Education level	undergraduate studies	Subject group			Obligatory subject group in the field of study		
Mode of study	part-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish polish		
Semester of study	1	ECTS credits			10.0		
Learning profile	academic	Assessment form					
Conducting unit	Zakład Optimalizacji Kombinatorycznej -> Instytut Informatyki -> Faculty of Mathematics, Physics and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Hanna Furmańczyk				
	Teachers		dr inż. Monika Rosicka dr Hanna Furmańczyk dr inż. Magda Dettlaff mgr Łukasz Mielewczyk				
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		0.0		190.0	250
Subject objectives	The aim of the course is to introduce the basics of Discrete Mathematics - details in the course description.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[INFL3_W02] has knowledge of discrete mathematics and probabilistic methods and statistics	knows basic algorithms in the field of: arithmetic in number systems with various bases knows the binary search method knows the basic issues of number theory, necessary to understand the RSA algorithm knows basic issues in combinatorics, algorithms for generating combinatorial objects knows selected data encryption methods (linear encryption, RSA algorithm) knows the concept of recursiveness, knows basic recursive algorithms	[SW4] test/exam - oral or written
	[INFL3_U03] can design and analyze algorithms for their correctness and computational complexity using appropriate algorithmic techniques and data structures	can perform a simple analysis of known algorithms, using e.g. recursion	[SU4] test/exam - oral or written
	[INFL3_U01] can apply mathematical knowledge to formulate, analyze and solve problems related to computer science	can use the method of mathematical induction to prove simple laws on natural numbers	[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written
[INFL3_U02] can precisely formulate questions to deepen one's understanding of a given topic or find missing elements of reasoning	is able to formulate questions regarding learned issues and conduct discussions on learned topics	[SU1] oral statement/conversation/discussion [SU8] observation of student's independent or team work	
Subject contents	<ol style="list-style-type: none"> 1. Mathematical induction. Combinatorics: counting and generating combinatorial objects (sequences, permutations, functions, subsets) (Newton's symbol). 2. Elements of logic and set theory. Functors of propositional calculus, laws of propositional calculus. The concept of a set and operations on sets. Equivalence relations. 3. Binary, hexadecimal and other systems; change of basis, arithmetic in the binary system. representation of numbers in the computer. Boolean functions, Boolean expressions, Boolean networks. 4. Divisibility of numbers. Congruence relation, Euclid's algorithm. 5. Encryption: linear, RSA. 6. Simple data structures. Lists, stacks, queues, trees, binary trees, arithmetic expression trees. 7. Recursion. Recursive procedure calling, recursive functions, methods of solving recursive equations. 8. Basics of graph theory. 		
Prerequisites and co-requisites	no requirements		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	50.0%	50.0%
	homeworks	0.0%	5.0%
	2 tests	50.0%	40.0%
activity in classes	0.0%	5.0%	
Recommended reading	Basic literature	A. Szepietowski, Matematyka dyskretna, Wyd. UG 2004. Electronic materials provided by the lecturer.	
	Supplementary literature	no	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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