



## Subject card

Subject name and code	Algorithms and Data Structures, PG_00058919						
Field of study	Informatics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group			Optional subject group 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			8.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marcin Jurkiewicz					
	Teachers	dr Marcin Jurkiewicz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	0.0	45
	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	45	8.0		147.0	200	
Subject objectives	The aim of the course is to teach students skills and present necessary tools to evaluate the effectiveness of a existing code, and to efficiently solve simple algorithmic problems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W06] Knows and understands the basic processes occurring in the life cycle of devices, facilities and systems specific to a given field of study.	Student is able to analyze problems and create appropriate models, data structures and heuristic algorithms, assess their computational complexity.			[SW1] Assessment of factual knowledge		
	[K6_U43] can analyse date and formulate, apply and assess appropriate formal models and algorithms for solving problems in the field of information systems and applications	Student knows combinatorial optimization algorithms, methods of construction, analysis and evaluation of algorithms. Student is able to analyze problems and create appropriate models, data structures, heuristic algorithms and assess their computational complexity.			[SU1] Assessment of task fulfilment		
	[K6_U07] can apply methods of process and function support, specific to the field of study	Student is able to analyze problems and create appropriate models, data structures and heuristic algorithms, assess their computational complexity.			[SU1] Assessment of task fulfilment		
Subject contents	Introduction to computational complexity analysis and the NP-completeness theory. Basic and advanced data structures (dictionaries, hashed arrays, trees, etc.) Sorting algorithms. Exact and greedy algorithms. Heuristics and approximate methods. Graph algorithms. Dynamic programming. Real complex networks.						
Prerequisites and co-requisites	basic knowledge of C language						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Lecture	50.0%			50.0%		
	Project	50.0%			50.0%		
Recommended reading	Basic literature	T.Cormen i in. "Introduction to data structures M.Kubale "Optymalizacja Dyskretna"					

	Supplementary literature	L.Banachowski i in. Algorytmy i struktury danych N.Wirth Algorithms + data structures = computer programs L.Banachowski i in. Analiza algorytmów i struktur danych M.Sysło i in. Algorytmy optymalizacji dyskretnej Krzysztof Goczyła Struktury danych
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	