



Subject card

Subject name and code	Introduction to algorithms, PG_00066245						
Field of study	Mathematics						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Optional subject group 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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Applied Mathematics -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jakub Maksymiuk					
	Teachers	dr inż. Jakub Maksymiuk					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	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		35.0	100	
Subject objectives	The aim of the course is to present issues related to the design and analysis of algorithms.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U10	Knows techniques for assessing the efficiency and complexity of algorithms.			[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	K6_W08	The student is able to describe the advantages and disadvantages of selected algorithms.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Lecture: Algorithmic problems The concept of computational complexity Analysis of recursive algorithms, divide-and-conquer algorithms Dynamic programming Classes P and NP. NP-complete problems As part of the laboratory, students perform exercises consisting of writing programs related to selected topics discussed during the lecture.						
Prerequisites and co-requisites	Basics of C++ programming.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
		50.0%			100.0%		
Recommended reading	Basic literature	T.H. Cormen, C.E. Leiserson, R.L. Rivest, C. Stein. Wprowadzenie do algorytmów. PWN 2022.					
		S. Skiena, The Algorithm Design Manual, Springer 2020					
		S. C. Dimri, P. Malik, M. Ram, Algorithms, de Gruyter 2021					

	Supplementary literature	A.V. Aho, J.E. Hopcroft, J.D. Ullman. Algorytmy i struktury danych. Wydawnictwo Helion, 2003. ISBN 83-7361-177-0 J. Arndt, Matters Computational_ Ideas, Algorithms, Source Code, Springer 2011
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed	<p>Estimate the computational complexity of a given algorithm written in pseudocode.</p> <p>Discuss the selected sorting algorithm and state its computational complexity.</p> <p>Implement and test the given algorithm.</p>	
Work placement	Not applicable	

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