GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basics of Algorithm Analysis, PG_00058918						
Field of study	Informatics						
Date of commencement of studies	October 2023		Academic year of realisation of subject	2024/2025			
Education level	first-cycle 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	Part-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	Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Marek Kubale				
	Teachers		mgr inż. Andrzej Jastrzębski				

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	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	30	4.0	66.0	100

Subject objectives	Obtaining skills of algorithms analysis in terms of computational complexity and memory complexity.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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 will learn principle issues of correct design of programs and will learn how to analyse the complexity of programs.	[SU4] Assessment of ability to use methods and tools
[K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study	Student will learn principle issues of correct design of programs and will learn how to analyse the complexity of programs. This concerns both recursive and non-recursive programs. In addition, he will know how to analyse the space complexity of programs.	[SW1] Assessment of factual knowledge
[K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	Student will learn principle issues of correct design of programs and will learn how to analyse the complexity of programs. This concerns both recursive and non-recursive programs.	[SW1] Assessment of factual knowledge
[K6_W41] Knows and understands, to an advanced extent, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining	Student will learn principle issues of correct design of programs and will learn how to analyse the complexity of programs. This concerns both recursive and non-recursive programs. In addition, he will know how to analyse the space complexity of programs.	[SW1] Assessment of factual knowledge
[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	Student will learn principle issues of correct design of programs and will learn how to analyse the complexity of programs.This concerns both recursive and non-recursive programs.	[SU4] Assessment of ability to use methods and tools

Subject contents

1. Algorithmic and non-algorithmic problems 2. Turing machine 3. The concept of computational complexity 4. Implementation and programming 5. Analysis of recursive algorithms, algorithms "divide and conquer" 6. Analysis of recursive algorithms, algorithms "one step back" 7. Fast matrix multiplication 8. Non-deterministic algorithms 9. Information on NP-hard problems.

Prerequisites and co-requisites

Passing the exam of discrete mathematics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written colloquium	50.0%	100.0%

Recommended reading

Basic literature	M. Kubale: Łagodne wprowadzenie do analizy algorytmów, WPG, Gdańsk, 2009. M. Kubale: Introduction to Computational Complexity and Algorithmic Graph Coloring, WGTN, Gdańsk, 1999.
Supplementary literature	No requirements
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable