GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Selected Problems in Algorithms and Technology, PG_00048013		
Field of study	Informatics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2027/2028
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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Algorithms and Systems Modelling -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Janczewski	
	Teachers	dr hab. inż. Robert Janczewski	

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	15.0	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	4.0	51.0	100

Subject objectives	Acquiring the ability to build and use models of discrete optimization and design effective solutions, exact and approximate.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U10] can individually plan their own lifelong education, also by means of advanced information and communication technologies (ICT), and communicate with people from their environment, firmly justify their point of view, participate in debates, present, assess and discuss different opinions and points of view, as well as use specialist terminology related to the field of study in communication	Student learns specialist terminology related to computer science.	[SU1] Assessment of task fulfilment
	[K6_W10] knows and understands to an advanced degree the basic processes occurring in the life cycle of equipment, objects and technical systems, as well as methods of supporting processes and functions, specific to the field of study	Student learns about the processes occurring in the software development life cycle.	[SW1] Assessment of factual knowledge
	[K6_U07] can apply methods of process and function support, specific to the field of study	Student learns methods of supporting IT processes.	[SU1] Assessment of task fulfilment

Subject contents	Course content – lecture 1. Design and analysis of algorithms. 2. Graph modelling and its applications. 3. Coloring problems and its applications. 4. Dominating problems and its applications. 5. Computational geometry and its applications. 6. Exact and approximation algorithms for selected graph problems. 7. Exact and approximation algorithms for selected geometry problems. 8. Grouping and clustering problems. 9. Combinatorial algorithms. 10. Algorithms for text processing and algebraic problems.
	Course content – seminar 1. Basic principles of designing and analyzing algorithms. 2. Graph-based models and their practical uses. 3. Coloring approaches and their applications. 4. Issues related to domination and their uses. 5. Topics in computational geometry along with their applications. 6. Exact as well as approximate methods for chosen graph-related problems. 7. Exact and approximate approaches for selected geometric problems. 8. Problems concerning clustering and classification. 9. Algorithms in the field of combinatorics. 10. Selected algorithms related to text processing and algebra.

Prerequisites and co-requisites	Discrete Mathematics Design and Analysis of Algorithms

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Egzamin	50.0%	60.0%
Presentation	50.0%	40.0%

Recommended reading

Basic literature	Jacob E. Goodman, Joseph O'Rourke, "Discrete and Computational Geometry". Vijay V. Vazirani "Approximation Algorithms".
Supplementary literature	No requirements
eResources addresses	

Example issues/ example questions/ tasks being completed	
Practical activites within the subject	Not applicable

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