



Subject card

Subject name and code	Selected Problems in Algorithms and Technology, PG_00067286						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2029/2030		
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			3.0		
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		26.0		75
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_W10] knows and understands, to an advanced extent, the parameters, functions, and methods of analysis, design, and optimization of electronic circuits and systems, the definitions of error and measurement uncertainty, measurement methods, including time, frequency, and phase measurements, the properties of converters, and methods of digital signal processing, as well as the basic processes occurring in the life cycle of technical devices, objects, and systems, and methods of supporting processes and functions, specific to the field of study	Student learns methods for analyzing, designing, and optimizing IT processes.	[SW1] Assessment of factual knowledge
	[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_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	<p>Course content – lecture</p> <ol style="list-style-type: none"> 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. <p>Course content – seminar</p> <ol style="list-style-type: none"> 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 activities within the subject	Not applicable		