GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Discrete Mathematics, PG_00058928		
Field of study	Informatics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	3	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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Paweł Obszarski	
	Teachers	dr Paweł Obszarski	

Lesson types

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

Getting familiar with the mathematical notation and techniques useful in discrete optimization.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Knows how to use in practice knowledge from graph theory, set theory and other	[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	Learns about numerous algorithmic aspects of set theory, combinatorics and graph theory	[SW1] Assessment of factual knowledge
[K6_K02] is ready to critically assess possessed knowledge and acknowledge the importance of knowledge in solving cognitive and practical problems	Learns about numerous mathematical models and their practical applications.	[SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Algebra of sets

Logic: tautologies, predicates

Mathematical induction

Binary relations: equivalence relation, equiivalence classes

Binary relations: partial order, Hasse diagrams

Binary relations: transitive closure, equivalence closure

Counting: functions, configurations, partitions,

Graph Theory: notation, basic terms

Graph Theory: Eulerian graphs, Chinese Postman Problem

Graph Theory: Hamiltonian graphs, Traveling Salesman Problem

Graph Theory: properties of trees

Graph Theory: planarity

Graph coloring</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written exam</td><td>51.0%</td><td>100.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>[1] K. A. Ross, C. R. B. Wright, Matematyka dyskretna, PWN, Warszawa 1996. [2] R. L. Graham, D. E. Knuth, O. Patashnik, Matematyka konkretna, PWN, Warszawa 1996. [3] W. Lipski, W. Marek, Analiza kombinatoryczna, PWN, Warszawa 1986. [4] H. Rasiowa, Wstęp do matematyki współczesnej, PWN, Warszawa 1984. [5] Robin J. Wilson, Wprowadzenie do teorii grafów, PWN, Warszawa 2000.</td></tr>
<tr><td>Supplementary literature</td><td>No requirements</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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