

## 。 GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

Subject name and code	Numerical methods, PG_00045296								
Field of study	Data Engineering								
Date of commencement of studies	October 2025		Academic year of realisation of subject			2025/2026			
Education level	el 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	Full-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			English			
Semester of study	2		ECTS credits			2.0			
Learning profile	general academic profile		Assessmer	ssessment form			assessment		
Conducting unit	Department Of Microwave And Antenna Engineering -> Faculty Of Electronics Telecommunications And Informatics -> Wydziały Politechniki Gdańskiej						ations And		
Name and surname of lecturer (lecturers)	Subject supervisor dr hab. inż. Grzegorz Fotyga								
	Teachers	dr hab. inż. Grzegorz Fotyga							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	15.0	0.0	15.0	0.0		0.0	30	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation ir classes includ plan		I didactic Participation in consultation hours		Self-study SUM				
	Number of study hours	30		4.0		16.0		50	
Subject objectives	A general aim of the course is to give the student the understanding of the theory and application of the basic numerical techniques and the knowledge how to implement them using high-level programming languages.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	[K6_U06] acquires new knowledge, planning its own development in aiming at achieving defined goals		The student knows and understands the basics of numerical analysis used to solve engineering problems. Based on this knowledge, he/she is able to understand and implement more complex algorithms related to specific applications.			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment			
	to think critically and analytically and integrates knowledge from many disciplines in order to make effective decisions [K6_W06] classifies the acquired information, assessing its usefulness in solving the formulated problems		problems using numerical methods that are adequate to the complexity of the problem. He/she is able to assess the computational complexity of the methods used and identify sources of possible numerical errors. The student is able to critically analyze and evaluate existing technical solutions, using both theoretical knowledge acquired during lectures and practical			Instant of ability to organize work   [SK2] Assessment of progress of work   [SK5] Assessment of ability to solve problems that arise in practice   [SW3] Assessment of knowledge contained in written work and projects   [SW2] Assessment of knowledge contained in presentation			
			knowledge acquired during laboratory classes.						

Subject contents	1 System of equations						
	2 Roots of Functions						
	3 Numerical errors						
	4 Interpolation						
	5 Approximation						
	6 Numerical integration						
Prerequisites and co-requisites	Participants should be familiar with the mathematical analysis and the programming basics.						
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade				
	Test	50.0%	60.0%				
	Laboratory	50.0%	40.0%				
Recommended reading	Basic literature	[1] Fortuna, Zenon, Bohdan Macukow, and Janusz Wa sowski. <i>Metody numeryczne</i> . Wydawnictwa Naukowo- Techniczene, 2002.					
		[2] Trefethen, Lloyd N., and David Bau III. <i>Numerical linear algebra</i> . Vol. 50. Siam, 1997.					
	Supplementary literature	[1] Solomon, Justin. <u>Numerical Algorithms</u> , AK Peters/CRC Press, 2015					
		https://people.csail.mit.edu/jsolomon/share/book/numerical_book.pdf					
	eResources addresses	Adresy na platformie eNauczanie:	platformie eNauczanie:				
Example issues/ example questions/ tasks being completed							
Work placement	Not applicable						

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