

GDAŃSK UNIVERSITY

Subject card

Subject name and code	Numerical Methods, PG_00038088								
Field of study	Electrical Engineering								
Date of commencement of studies	October 2025		Academic year of realisation of subject			2025/2026			
Education level	first-cycle studies		Subject group						
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			Polish			
Semester of study	2		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Faculty Of Electrical And Control Engineering -> Wydziały Politechniki Gdańskiej								
Name and surname of lecturer (lecturers)	Subject supervisor dr hab. inż. Mirosław Wołoszyn								
	Teachers								
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	oject Semina		SUM	
	Number of study hours	15.0	30.0	0.0	0.0		0.0	45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM	
	Number of study 45 hours			4.0		26.0		75	
Subject objectives	The purpose of the course is for the student to master the numerical methods used in engineering calculations.								
Learning outcomes	Course outcome		Subject outcome			Method of verification			
	K6_U05								
	K6_W01								
Subject contents	Computer arithmetic and round-off error, floating-point representation. Numerical matrix algebra: systems of linear algebraic equations, Gauss elimination, Gauss - Jordan elimination, LU decomposition, computation of the inverse matrix, iterative methods. Nonlinear algebraic equations: one equation: bisection, regula-falsi method, secant method, Newtons method, system of equations: fixed-point iterations, Newtons method. Function interpolation: Lagrange polynomials. Numerical differentiation of a function of one variable, backward, centered, and forward differences. Approximation of functions: least-squares n polynomials. Numerical integration of one-dimensional integrals: Newton-Cotes rules, Romberg integration, Gauss-Legendre quadrature, singular integrands, integrals over infinite domains. Initial-value problems for ordinary differential equations: polynomial approximation, Euler method.								
Prerequisites and co-requisites									
Assessment methods and criteria	Subject passing criteria		Passing threshold			Percentage of the final grade			
	tests and work on exercises		60.0%		88.0%				
	tasks from lectures		60.0%		12.0%				
Recommended reading	Basic literature		C. Pozrikidis: Numerical Computation in Science and Engineering,Oxford University Press 1998.						
	Supplementary literature		James F. Epperson: An introduction to numerical methods and analysis. Wiley, 2013						
	eResources addresses Adresy na platformie eNauczanie:								
Example issues/ example questions/ tasks being completed	The solution of equations by Gauss, LU, GS. Lagrange interpolation function method. Approximation of the function sin (x) using the mean square approximation. Calculation of integrals by Simpson. The solution of nonlinear equations using Newton's method. The solution of differential equations using Euler's method.								
Work placement	Not applicable	Not applicable							

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