



## Subject card

Subject name and code	Numerical methods, PG_00060541						
Field of study	Design and Construction of Yachts, Naval Architecture and Offshore Structures						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2025/2026		
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	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Aleksander Kniat					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	30.0	0.0	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	5.0		50.0	100	
Subject objectives	The subject is intended to familiarize students with numerical methods for solving basic problems in the field of mathematical analysis. For this purpose, examples will be presented, and then students will solve the exercises themselves. Completing the exercises will require basic programming skills in Python or C# language.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W04] has knowledge in the field of computer science, electronics, electrical engineering, automation and control, information technology, computer graphics, useful for understanding the possibilities of their use in ocean engineering	Student is able to choose the right method to solve a problem and can present the results.			[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U02] can work individually and in a team, communicate through various techniques in professional environment and also record, analyse, and present the results of work, can estimate the time needed to complete a given task	Student can write a simple program, that performs numerical calculations and displays results.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task		
Subject contents	searching for zeros of functions bisection method Newton's method  numerical integration square/trapezium method Simpson's method  solving differential equations Euler's method  interpolation polynomial (Lagrange's polynomial) splines						

Prerequisites and co-requisites	1. basic knowlegde in the field of mathematical analysis  2. basic understandin how to write a program in Python or C# language		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	completed excercises	50.0%	100.0%
Recommended reading	Basic literature	Fortuna Z., Macukow B., Wąsowski J., Metody numeryczne, wyd. 7, Wydawnictwo Naukowe PWN, Warszawa, 2024 Rosłonec S., Wybrane metody numeryczne z przykładami zastosowań w zadaniach inżynierskich, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2020 Bjorck A., Dahlquis G., Metody numeryczne, wyd. 2, Państwowe Wydawnictwo Naukowe, Warszawa 1987	
	Supplementary literature	Chapra S., Clough D., Applied Numerical Methods with Python for Engineers and Scientists, 1st Edition, Mc Graw Hill, 2022	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		