GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Application of Numerical Methods, PG_00041639		
Field of study	Ocean Engineering, Ocean Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group 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	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Hydromechanics and Hydroacoustics -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Krężelewski	
	Teachers	mgr inż. Olga Kazimierska dr inż. Michał Krężelewski dr inż. Joanna Grzelak	

Lesson types and methods of instruction

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

Adresy na platformie eNauczanie:

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	5.0	15.0	50

Subject objectives: Getting to know numerical methods using Matlab.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] has a basic knowledge in IT, electronics, automation and control, computer graphics useful to understand the possibilities of their application in ocean technology	Is able to obtain a solution to a problem formulated mathematically with the use of numerical and information methods in Matlab.	[SW3] Assessment of knowledge contained in written work and projects
[K6_W01] has a basic knowledge in maths, including algebra, elements of logics, geometry, mathematical analysis, theory of probability necessary to describe and analyse the operation of machines and ocean-technology objects	Can describe a problem on the basis of knowledge in the field of mathematics with the use of numerical methods to solve it.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents: Introduction. Interpolation and approximation. Solving systems of algae equations. linear. Solving algae. nonlinear equations. Numerical methods of integration. Solving ordinary differential equations. Numerical optimization methods.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquium 2 times per semester	50.0%	100.0%

Recommended reading	Basic literature	1..Zenon Fortuna, Bohdan Macukow, Janusz Wąsowski, Metody numeryczne, WNT, Warszawa 2015 2. Germund Dahlquist, Ake Björck, Metody numeryczne, PWN, Warszawa 1983
	Supplementary literature	1. A. Ralston, Wstęp do analizy numerycznej, Warszawa 1971. 2. J. Stoer, R. Bulirsch Wstęp do analizy numerycznej, PWN, Warszawa 1987.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Gaussian elimination method.2. Interpolation by the Chebyshev method.3. Numerical integration using the trapezoidal method.4. Approximate methods of solving nonlinear equations. Chord method.5. Numerical calculating Simpson formula.6. Describe the main principles of using numerical methods.	
Work placement	Not applicable	