

Subject card

Subject name and code	Algorithms and their application, PG_00131544						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2028/2029		
Education level	Bachelor's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	4		Language of instruction		Polish		
Semester of study	7		ECTS credits		2.0		
Learning profile	practical		Assessment form		credit		
Conducting unit	Laboratory of Physical Oceanography -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Aleksandra Dudkowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	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		2.0		20.0	52
Subject objectives	To explain the operation of widely used computer algorithms.To provide a basic knowledge of numerical methods and modern algorithms. This knowledge will enable you to make informed use of their possibilities in your professional work and everyday life.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[HML3-U05] when identifying, formulating and solving engineering tasks, integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects	In formulating and solving engineering tasks, integrate knowledge from different fields and disciplines and apply a systems approach that also takes non-technical aspects into account.	[SU1] oral statement/conversation/discussion [SU4] test/exam - oral or written
	[HML3-W02] selected phenomena and processes occurring in the hydrosphere, atmosphere, lithosphere and biosphere, their interconnections and relations, as well as practical applications of this knowledge in professional activities related to the field of study	Definitions and terms from the field of engineering sciences, including electrical engineering, electronics, automation, computer science, and from the field of science and natural sciences, in particular Earth and environmental sciences	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
	[HML3-U08] independently use the professional literature available in traditional and electronic form, make an assessment, critical analysis and synthesis as well as the correct interpretation of the information obtained	Independently use the professional literature and the Internet; is able to integrate, evaluate and correctly interpret the information obtained and, on the basis of this information, draw conclusions, form opinions and take action	[SU1] oral statement/conversation/discussion
	[HML3-W01] selected facts, phenomena and processes, as well as methods and theories concerning them, explaining the complex relationships between them, constituting basic general knowledge in the field of scientific disciplines forming the theoretical foundations specific to the field of study	Definitions and terms from the field of engineering sciences, including electrical engineering, electronics, automation, computer science, and from the field of science and natural sciences, in particular Earth and environmental sciences	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
Subject contents	Fundamentals of algorithms. Errors in numerical computing. Numerical algorithms: search and sort, Monte Carlo method, pseudo-random number generators, cellular automata, neural networks, machine learning and artificial intelligence, natural language processing, classification and recommendation.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	colloquium	51.0%	100.0%
Recommended reading	Basic literature	DASGUPTA S., PAPADIMITRIOU Ch., VAZIRANI U.: Algorytmy. Wyd. naukowe PWN, Warszawa 2019. (in Polish) RUTKOWSKI L.: Metody i techniki sztucznej inteligencji: inteligencja obliczeniowa. Wyd. naukowe PWN, Warszawa 2019. (in Polish) SEdgeWICK R.: Algorytmy. Helion, 2012.(in Polish)	
	Supplementary literature	recommended during classes by the teacher	
	eResources addresses		
	Example issues/ example questions/ tasks being completed		
Work placement	Not applicable		

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