University of Gdańsk

Subject card

Subject name and code	Algorithms and their Application - lecture, PG_00201163		
Field of study	Marine Hydrography		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2029/2030
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	1.0	19.0	50

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.

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<tr><td>Learning outcomes</td><td>
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<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[HML3-W01] knows and understands, at an advanced level, 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</td><td>knows and understands, at an advanced level, concepts and terminology in the fields of engineering and technology, including electrical engineering, electronics, automation, and computer science, as well as in the fields of mathematics and the natural sciences, particularly Earth and environmental sciences</td><td>[SW4] test/exam - oral or written
[SW1] oral statement/ conversation/discussion</td></tr>
<tr><td>[HML3-W02] knows and understands, at an advanced level, 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</td><td>knows and understands, at an advanced level, concepts and terminology in the fields of engineering and technology, including electrical engineering, electronics, automation, and computer science, as well as in the fields of mathematics and the natural sciences, particularly Earth and environmental sciences</td><td>[SW4] test/exam - oral or written
[SW1] oral statement/ conversation/discussion</td></tr>
<tr><td>[HML3-U05] when identifying, formulating and solving engineering tasks, is able to integrate knowledge from various fields and disciplines and perceive their systemic and non-technical aspects, including ethical aspects</td><td>when formulating and solving engineering problems, is able to integrate knowledge from various fields and disciplines and apply a systems-based approach that also takes non-technical aspects into account</td><td>[SU1] oral statement/conversation/ discussion
[SU4] test/exam - oral or written</td></tr>
<tr><td>[HML3-U08] is able to 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</td><td>is able to independently use specialized literature and online resources; is able to synthesize, evaluate, and correctly interpret the information obtained, and, based on this information, draw conclusions, form opinions, and take action</td><td>[SU1] oral statement/conversation/ discussion</td></tr>
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<tr><td>Subject contents</td><td>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.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>colloquium</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>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)</td></tr>
<tr><td>Supplementary literature</td><td>recommended during classes by the teacher</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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