



Subject card

Subject name and code	, PG_00057243							
Field of study	Ocean Engineering							
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023			
Education level	second-cycle studies	Subject group			Obligatory subject group in the field of study 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	1	Language of instruction			Polish			
Semester of study	1	ECTS credits			3.0			
Learning profile	general academic profile	Assessment form			assessment			
Conducting unit	Faculty of Ocean Engineering and Ship Technology							
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Tacjana Niksa-Rynkiewicz					
	Teachers		dr inż. Tacjana Niksa-Rynkiewicz					
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							
Teoria optymalizacji OCE II sem 1 lato 2022/2023 - Moodle ID: 30149 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30149								
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		40.0	75	
Subject objectives	The aim of the lecture is to extend knowledge about optimization methods using artificial intelligence methods. The aim of the exercises is to study the effectiveness of various optimization methods and to apply selected methods to solve practical engineering problems.							
Learning outcomes	Course outcome		Subject outcome			Method of verification		
	[K7_W01] has a deepened and widened knowledge on certain fields of maths, used to formulate, solve and verify complex problems in ocean-technology		The student knows optimization methods based on methods used in artificial intelligence, evolutionary algorithms			[SW1] Assessment of factual knowledge		
	[K7_U02] can plan and conduct research experiments on selected problems in ocean technology using various research methods		He/She is able to use mathematical methods for the description of decision processes in selected problems in the field of ocean engineering			[SU2] Assessment of ability to analyse information		
[K7_W02] has a widened knowledge in the range of modelling technological processes, including knowledge necessary to describe and assess the functioning of selected elements of ocean technology objects and systems		The student knows the classification of problems and optimization methods using AI and the possibilities of solving them			[SW1] Assessment of factual knowledge			
Subject contents	1. Introduction 2. Optimization and AI methods 3. Genetic algorithms 4. Evolutionary algorithms 5. Application of evolutionary algorithms in the optimization process							

Prerequisites and co-requisites	Knowledge at the level of first degree.major Ocean Engineering:Mathematics IMathematics IIApplication of numerical methods		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	colloquy	56.0%	100.0%
Recommended reading	Basic literature	1. Amborski, K., Podstawy metod optymalizacji, Oficyna Wydawnicza Politechniki Warszawskiej, 2009. 2. Stachurski, A. Wprowadzenie do optymalizacji, Oficyna Wydawnicza Politechniki Warszawskiej, 2009.	
	Supplementary literature	1. 1.D"Azzo J.J., Houpis C.H., Linear control system analysis and design- conventional and modern, MCGraw Hill Co.,1988 2. D'Souza A.F., Design of control systems, Prentice Hall, 1988 3. 2 Kukula K., Badania operacyjne w przykladach i zadaniach, PWN, Warszawa 2011 4. Milkiewicz F., Podstawy optymalizacji, Wydawnictwo PG, 1995 5. Stengel R. F., Optimal control and estimation, Dover Publications Inc., New York, 1994.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Please provide the assumptions of the genetic algorithm 2. Please analyze the crossing methods		
Work placement	Not applicable		