GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Artificial Intelligence, PG_00057032					
Field of study	Mechatronics					
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024	
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	2		ECTS credits		2.0	
Learning profile	general academic profile		Assessment form		exam	
Conducting unit	Zakład Mechatroniki -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology					
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Galewski			
	Teachers		dr hab. inż. Marek Galewski			

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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	4.0	16.0	50

Subject objectives	Presenting students the most important ideas and algorithms of Artifficial Intelligence

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_U06] is able to evaluate feasibility and possibility of application of new achievements (technical and technological) in terms of mechatronics	Student chooses AI algorithms appropriate to solve a given problem	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
	[K7_W05] has detailed, supported by the theory knowledge in terms of control theory, identification methods, concurrent and real time programing, signal and image processing and Artificial Intelligence	Student presents selected AI algorithms	[SW1] Assessment of factual knowledge
	[K7_U04] is able to utilise known methods and mathematical models, as well as computer simulations for analysis and evaluation of non-stationary continuous and discrete mechatronic systems and processes	Student processes signals and data using AI methods	[SU1] Assessment of task fulfilment

Subject contents	Introduction to AI - essential terms, history, achievements, perspectives Graph based method for solution search and optimisation - eleemnts of graphs, sample search algorithms (DFS, BFS, HCA, Dijkstra, A*) Evolutionary and genetic algorithms - essential terms,applications, genetic operators, slection methods, algorithm specificity, classic genetic algorithm Swarm intelligence - essential terms,applications,PSO, SSA and other selectec algorithm Artificial Neural Networks Expert Systems (optional) Intelligent Agents(optional)
Prerequisites and co-requisites	Programming skills in Matlab, C, C++, Java or Python

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Projects	51.0%	25.0%
	Written test	51.0%	75.0%

Recommended reading	Basic literature	Norvig P, Russel S, Artificial Intelligence: A Modern Approach, Global Edition, 2021
	Supplementary literature	Any general book on AI, ANN (incl. Deep Learning) and genetic algorithms
	eResources addresses	Adresy na platformie eNauczanie: Sztuczna Inteligencja, WP, MTR II st., sem. 02, zimowy 23/24 (PG_00057032) - Moodle ID: 30300 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30300

Example issues/ example questions/ tasks being completed	Describe Dijkstra algorithm Describe algorithm for learning artificial neuron Present advantages, disadvantages and limitations of ANN Full list of examplary questions will be presented to students before the test.

Work placement	Not applicable