



Subject card

Subject name and code	Artificial Intelligence, PG_00064790						
Field of study	Mechatronics						
Date of commencement of studies	February 2025	Academic year of realisation of subject				2025/2026	
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				3.0	
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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	10.0	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	8.0	37.0	75		
Subject objectives	Presenting students the most important ideas and algorithms of Artificial Intelligence, especially Genetic Algorithms and Artificial Neural Networks.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W04] demonstrates knowledge encompassing selected issues in the field of detailed knowledge, particularly in the scope of methods, techniques, tools, and algorithms specific to Mechatronics	The student presents the operation of selected Artificial Intelligence algorithms and selects AI algorithms appropriate for solving the given problem.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K7_K13] is ready for responsible performance of professional roles, considering ever-changing need of the society, including self development and supporting and fulfilling work ethics	The student understands the necessity of continuously updating their knowledge due to the rapid development of AI and is aware of the changes that follow, as well as the responsibility that rests on the creators and users of AI methods.			[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice		
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study	The student presents the most important trends in the development of Artificial Intelligence.			[SW1] Assessment of factual knowledge		
Subject contents	Introduction to AI - essential terms, history, achievements, perspectives, impact of AI on the society and the individuals Graph based method for solution search and optimisation - elements of graphs, sample search algorithms (DFS, BFS, HCA, Dijkstra, A*) Evolutionary and genetic algorithms - essential terms, applications, genetic operators, selection methods, algorithm specificity, classic genetic algorithm Swarm intelligence - essential terms, applications, PSO, SSA and other selected algorithms Artificial neural networks concepts, applications, structure of an artificial neuron, network architecture, idea of backpropagation, learning algorithms, deep 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
	Written test	51.0%	75.0%
	Projects	51.0%	25.0%
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 eNauzanie:	
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 exemplary questions will be presented to students before the test.		
Work placement	Not applicable		

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