



Subject card

Subject name and code	Artificial Intelligence, PG_00064790						
Field of study	Mechatronics						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
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	Division of Mechatronics -> Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology -> Wydział Politechniki Gdańskiej						
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_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		
	[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.		[SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work		
	[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.		[SW3] Assessment of knowledge contained in written work and projects [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
	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		
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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