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 Artiificial 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