

COURSE DESCRIPTION

HIGHER VOCATIONAL STATE SCHOOL IN WLOCLAWEK

Course: Artificial intelligence

Field of study:	Computer Science						Course code:
Unit supervising the course:	Instytut Nauk Społecznych i Technicznych, Zakład Informatyki						
Course orientation:	Practical						
Language of instruction:	English						
Course type:	Directional						
Course status:	Mandatory						
Level: I	Year: I			Semester: I			
The number of teaching hours on the full-time programme:							
Total	lecture	classes	laboratory	projects	tutorials	seminars	practicum
30	15	-	15	-	-	-	-
The number of teaching hours on the part-time programme:							
Total	lecture	classes	laboratory	projects	tutorials	seminars	practicum
-	-	-	-	-	-	-	-
Learning outcomes:			Knowledge: <ul style="list-style-type: none">• Student knows the basic methods, techniques and tools used to solve simple computer's tasks in the field of design and implementation of information systems, operating systems, computer networks and distributed systems, artificial intelligence, databases, software engineering and systems security.• Student has general and specific knowledge in the field of algorithms and their complexity, operating systems, networking technologies, languages and programming paradigms, graphics and multimedia technology, human-computer communication, artificial intelligence, databases, software engineering, embedded systems.				
			Skills: <ul style="list-style-type: none">• Student recognizes the problems to be solved, which requires the use of artificial intelligence methods; is able to select and apply appropriate methods of artificial intelligence to solve tasks.				
			Social competence: <ul style="list-style-type: none">• has a sense of responsibility for own work and the willingness to submit to the rules work in a team and to take responsibility for collaborative tasks.				

<p>Full description of the course:</p>	<p>Lecture:</p> <ul style="list-style-type: none"> • Explanation of basic concepts of natural intelligence, artificial intelligence, types of intelligence, • Fuzzy logic. Description of uncertainty. Fuzziness and probability. • Bayesian inference. Bayesian Networks. • K-NN method. Bayesian classifier. • Classification trees and family classifiers. • Knowledge base and inference methods. • Designing a generalized expert system. • Biological sources of artificial neural networks and the basic concepts of artificial neural networks (neurons, network architecture). • The selected architecture and neural network learning methods. • The convergence of the perceptron learning algorithm. • Network multilayered. • Learning by backpropagation. • The adaptive linear neuron. Wiener - Hoff equation. Newton-Raphson algorithm. The ideal method of steepest descent gradient. Rule Widrow-Hoff delta. • Recursive least squares method. Self-organizing networks. CP network. • Classification. Linear separability. • The basic genetic algorithm and the possibility of co- genetic algorithm with neural networks. • Some applications, such as prediction, animation, medicine, robotics, information retrieval. <p>Laboratory: The program provides an illustration of selected methods discussed in the lecture. Basic exercises include the implementation of different methods (eg. fuzzy logic, decision trees, Bayesian inference, neural networks, etc.).</p>																
<p>Methods:</p>	<p>Lecture: The lecture and multimedia presentation.</p> <p>Laboratory: Laboratory exercises.</p>																
<p>The student's workload/ ECTS credits:</p>	<p>Forms of activities</p>	<p>Average number of hours to complete activities</p> <table border="1" data-bbox="949 1552 1463 1664"> <thead> <tr> <th colspan="2">Full-time</th> <th colspan="2">Part-time</th> </tr> <tr> <th>Lecture</th> <th>Classes</th> <th>Lecture</th> <th>Classes</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Full-time		Part-time		Lecture	Classes	Lecture	Classes				
Full-time		Part-time															
Lecture	Classes	Lecture	Classes														
	<p>Contact hours with academic instructor</p>	<p>39</p>	<p>39</p>	<p>-</p>	<p>-</p>												
	<p>Hours without academic instructor</p>	<p>36</p>	<p>36</p>	<p>-</p>	<p>-</p>												
	<p>1. Preparation for the classes, including reading assignments</p>	<p>15</p>	<p>15</p>	<p>-</p>	<p>-</p>												

	2. processing the quantitative data /preparation for the exam, evaluation tests, etc.	15	15	-	-
	3. Preparation of a report, presentation, discussion	6	6	-	-
	Total	75	75	-	-
	Total number of ECTS for the conducted form of classes	3	3	-	-
	Total number of ECTS points for the entire course	6		-	
The type and mode of obtaining the credit and marking criteria or requirements:	The type:				
	<ul style="list-style-type: none"> • Lecture – exam • Laboratory - credit rating. 				
	The mode:				
	<ul style="list-style-type: none"> • Lecture - written exam with open questions, • Laboratory – realization of lab exercises and presentation. 				
	Basic assessment criteria:				
	<ul style="list-style-type: none"> • Lecture - written exam with open questions included in the assessment of positive • Laboratory – realization of scheduled laboratory exercises for at least a satisfactory grade. 				
Literature:	<p>Prescribed reading: Zadeh L. A., "Fuzzy Sets, Fuzzy Logic, and Fuzzy Systems", World Scientific, 1996 Ross T. J., "Fuzzy Logic with Engineering Applications", Wiley, 2004 Castillo O., Melin P., "Recent Advances in Interval Type-2 Fuzzy Systems", Springer-Verlag Gmbh, 2012</p> <p>Recommended reading: Syropoulos A., "Theory of Fuzzy Computation", Springer-Verlag Gmbh, 2013 Scherer R., "Multiple Fuzzy Classification Systems", Springer-Verlag Gmbh, 2012</p>				
Course instructor: mgr inż. Marcin Kacprowicz					