



Subject card

Subject name and code	Agent systems, PG_00045385						
Field of study	Data Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group 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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Computer Architecture -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mariusz Matuszek					
	Teachers						
Lesson type and method 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		6.0		64.0	100
Subject objectives	The aim of the course is introduction to theory and practice of agent methodology in distributed systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W04] Knows the architecture of computers, operating system processes, file systems, text processing programs, disk and ram memories management rules. Knows the problems of sharing the state, presentation and transformation of information in a distributed system, hypermedia technologies and related services, the architecture of interactive distributed simulation and agent interaction methods.	Student knows methods and protocols of agent interactions, including use of ontologies as well as standard communication patterns. Student is aware of issues with coherent state sharing in a distributed multiagent system.			[SW1] Assessment of factual knowledge		
	[K6_U03] analyses problems and creates appropriate models, data structures and algorithms (including heuristic and numerical ones), assesses their computational complexity, estimates errors of the received solutions	Student designs and implements agent interaction models resulting in cooperation and cooperation between agents.			[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K6_W06] Knows the criteria and concepts of artificial intelligence, understands the operation of algorithms for intelligent computing, the concept of descriptive logic, combinatorial optimization algorithms, methods of construction, analysis and evaluation of algorithms, including discrete ones and problems of resolving conflicts in non-algorithmic decision making.	Student is aware of uses of formal logic methods in agent decision process design. Student considers agent's environment properties when choosing appropriate agent behaviour algorithms. Student knows use of multiagent negotiations in conflict solving.			[SW1] Assessment of factual knowledge		

Subject contents	<ol style="list-style-type: none"> 1. Explanation of criteria to successfully complete the course 2. Introduction to scope of the lecture and issues in multiagent systems 3. Definitions of agent and agent environment 4. Agent models and architectures 5. BDI agent properties 6. Rules of agent interactions 7. Agent algorithm properties 8. Agent search algorithms 9. Agent recommendation algorithms 10. Agent negotiation algorithms 11. Agent application structure 12. Lifecycle of agent application 13. Using services in an agent application 14. Agent development environments 15. Agent runtime environments 16. Examples of agent applications 17. Tests and exams 			
Prerequisites and co-requisites	A basic knowledge of the Java programming language, as well as command line access to Linux helps.			
Assessment methods and criteria	Subject passing criteria		Passing threshold	Percentage of the final grade
	written test		50.0%	50.0%
	practical exercises		50.0%	50.0%
Recommended reading	Basic literature		<ol style="list-style-type: none"> 1. Woolridge Michael: An Introduction to Multiagent Systems. 2. Weiss Gerhard (Ed.): Multiagent Systems - A Modern Approach to Distributed Artificial Intelligence. 	
	Supplementary literature		<ol style="list-style-type: none"> 1. JADE - Users Guide (*) 2. JADE - Administrator Guide (*) <p style="text-align: center;">(*) applies to hands-on exercises</p>	
	eResources addresses			
Example issues/ example questions/ tasks being completed	<p>Implement a mobile agent with given functionality. Implement an agent service and publish it in the agent's environment. Describe the use of ontologies in agent environments.</p>			
Work placement	Not applicable			