



Subject card

Subject name and code	Agent systems, PG_00045385						
Field of study	Data Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject			2025/2026	
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		dr inż. Mariusz Matuszek				
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	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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>written test</td> <td>50.0%</td> <td>50.0%</td> </tr> <tr> <td>practical exercises</td> <td>50.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	written test	50.0%	50.0%	practical exercises	50.0%	50.0%
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Recommended reading	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 40%;">Basic literature</td> <td colspan="2" data-bbox="802 660 1489 741"> <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. </td> </tr> <tr> <td>Supplementary literature</td> <td colspan="2" data-bbox="802 750 1489 920"> <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> </td> </tr> <tr> <td>eResources addresses</td> <td colspan="2" data-bbox="802 929 1489 965">Adresy na platformie eNauczanie:</td> </tr> </tbody> </table>			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	Adresy na platformie eNauczanie:	
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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											

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