GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Agent systems, PG_00045385		
Field of study	Data Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
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 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_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
[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.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[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

<table>
<tr><td>Subject contents</td><td>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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>A basic knowledge of the Java programming language, as well as command line access to Linux helps.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>practical exercises</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>written test</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>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>1. JADE - Users Guide (*)
2. JADE - Administrator Guide (*)

(*) applies to hands-on exercises</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>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.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
</table>