STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Agent systems**	Code **1010334591010332548**

Field of study **Information Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **5 / 9**

Elective path/specialty **Information Technologies**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**

Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**

No. of hours	No. of credits
Lecture: **16** Classes: **-** Laboratory: **8** Project/seminars: **-**	**5**

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art **technical sciences** **Technical sciences**	ECTS distribution (number and %**)** **5 100%** **5 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has well founded knowledge of program constructs, implementation of algorithms, compilers, programming platforms and software engineering.
2	**Skills**	Student is able to acquire information from literature, data bases and other sources, to create engineer work documentation and to prepare text with the work result discussion. Student is able to use software platforms and environments for programs encoding, running and testing.
3	**Social competencies**	Student understands the responsibility associated to his own work. Student is able to adhere to team work rules and to take responsibility for cooperative tasks.

Assumptions and objectives of the course:

Presentation of software solutions from modern distributed systems, particularly Multi-Agent Systems (MAS). Learning solutions from communication, coordination and cooperation areas of MAS.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has organized and theoretically founded knowledge of agent systems. - [[K_W09]]

2. Student has organized and theoretically founded knowledge of software agent engineering. - [[K_W12]]

3. Student is familiarized with state of the art and current trends in computer science. - [[K_W19]]

Skills:

1. Student is able to read descriptions and manuals of software tools.   - [[K_U06]]

2. Student is able to plan and perform experiments, to use mathematical methods, models and computer simulation to test, analyze and assess agent system performance.   - [[K_U07]]

3. Student is able to define and create a simple agent system.   - [[K_U13]]

Social competencies:

1. Student understands the necessity of continuous education and development of different skills (linguistic, professional, personal and social). - [[K_K01]]

2. Student understands the importance of stringent accomplishment of a given project with proper notation standards, proper language. Student understands the importance of keeping deadlines. - [[K_K07]]

Assessment methods of study outcomes

Lecture

Written exam based on lecture (basic concepts and techniques used in agent systems).

Laboratory

Students? marks are based on continuous assessment of exercises and presentation of their results.

Course description

Lecture

Concept of agent, software agents classification. Characteristics of deliberative, reactive and interactive agents. Generic and hybrid architectures. Multi-agent systems (MAS), and open systems properties. Standards of knowledge sharing and communication languages in MAS. Coordination and cooperation methods.

Teaching methods:

- presentation of the theory with references to practical examples of software implementations,

- lecture with multimedia presentation,

- students being asked questions during the lectures in order to provoke discussions.

Course update 2017:

- presentation of actor model,

- new set of examples.

Laboratory

Students practice with agent applications and modify by themselves parts of such systems. Exemplary plan for SeSam system: analysis and running of example models, individual models of simple agents, plan of agent actions, individual modifications of an agent system.

Teaching methods

- individual work (homework mainly),

- open-source tools and software components made available to students to support their homework.

- short presentation, discussions and the evaluation of student's solutions.

Laboratoty update 2017:

- generally modyfied set of examples and tasks.

Basic bibliography:

1. Pankowski T., Brzykcy G., Data Access Based on Faceted Queries over Ontologies. Hartmann S., Ma H. (eds.), Database and Expert Systems Applications, 27th International Conference, DEXA 2016, Porto, Portugal, September 5-8, 2016, Proceedings, Part II, Lecture Notes in Computer Science 9828, Springer International Publishing 2016.

2. SeSam documentation from www.simsesam.de (september 2017).

3. Wooldridge M.: An Introduction to MultiAgent Systems , Second Edition. John Wiley & Sons, 2009.

4. Wooldridge M., Jennings R.: Agent Technology. Springer, 2010.

Additional bibliography:

1. Bradshaw J. (ed.): Software Agents. The MIT Press, 1997.

2. Müller J.: The Design of Intelligent Agents. A Layered Approach. LNAI 1177, Springer, 1996.

Result of average student's workload

Activity	Time (working hours)
1. Lecture	16
2. Laboratory	8
3. Preparation to laboratory	44
4. Preparation to exam	36

Student's workload

Source of workload	hours	ECTS
Total workload	104	5
Contact hours	28	2
Practical activities	52	2