STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Agent systems in automatic control and robotics-)	**1010332221010335796**

Field of study	Profile of study (general academic, practical)	Year /Semester
Automatic Control and Robotics	**(brak)**	**1 / 2**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Robotics	**Polish**	**elective**

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

No. of hours	No. of credits
Lecture: **30** Classes: **-** Laboratory: **30** Project/seminars: **-**	**5**

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

Education areas and fields of science and art	ECTS distribution (number and %)

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 software agent engineering. - [[K_W02]]
2. Student is familiarized with state of the art and current trends in computer science. - [[K_W05]]
3. Student has organized and theoretically founded knowledge of agent systems. - [[K_W06]]

Skills:

1. 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_U04]]
2. Student is able to define and create a simple agent system. - [[K_U07]]
3. Student is able to read descriptions and manuals of software tools. - [[K_U10]]

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. Learning agents, mobile agents.

Laboratory

Students practice with agent applications and design 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, communication between agents, coordination of agent actions, individual project of agent system.

Basic bibliography:

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

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

Additional bibliography:

1. Bigus J. P., Bigus J.: Constructing Itelligent Agents with Java. A Propgrammer?s Guide to Smarter Applications. John Wiley & Sons, 1998.

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

3. 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	30
2. Laboratory	30
3. Preparation to laboratory	30
4. Preparation to exam	35

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	60	3
Practical activities	50	2