

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: EXPERT SYSTEMS		2. Course code		
3. Validity of course description: 2012/2013				
4. Level of studies: MSc programme				
5. Mode of studies: intramural studies				
6. Field of study: AUTOMATICS AND ROBOTICS		(FACULTY SYMBOL)AEII		
7. Profile of studies: : academic				
8. Programme:				
9. Semester: 1				
10. Faculty teaching the course: Institute of Automatic Control, Rau1				
11. Course instructor: dr hab. inż. J. Figwer prof. Pol. Śl.				
12. Course classification: compulsory course				
13. Course status: compulsory				
14. Language of instruction: English				
15. Pre-requisite qualifications: : It is assumed that student is familiar with a basic logic, probability and statistics, programming methods and control.				
16. Course objectives: Expert systems are decision support systems that are a part of artificial intelligence. The aim of the course is to give students basic knowledge concerning expert systems and knowledge engineering.				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	The student knows the concept of expert systems and their functional and informatics structure.	SP	WT	
2.	The student knows the methods of knowledge acquisition and representation.	SP	WT	
3.	The student knows exact and uncertain methods of forward and backward inference.	SP	WT	
4.	The student can acquire and code knowledge in a knowledge base and use shell expert systems.	SP	WT, WM, P	
5.	The student can design inference systems for shell based expert systems.	OP	P	
6.	The student is able to present and defend the proposed solution to a given problem in the field of expert systems.	OP	P	
18. Teaching modes and hours				
Lecture: 15 / BA /MA Seminar: 0 / Class: 0 / Project: 15 / Laboratory: 0				
19. Syllabus description:				
Lecture:				
The course on Expert Systems concerns the following topics: artificial intelligence – history, definition, foundations, basic ideas and state of the art; knowledge representation and methods of knowledge acquisition; expert system definition, functional and informatics structure of expert system; knowledge bases and their structure; inference systems, user’s interface; facts and rules; problems with rule based knowledge representation; exact and uncertain, forward and backward chaining inference; software				

realisation of inference systems; knowledge acquisition in examples: system modeling, identification methods, design of single- and multi-channel control systems, optimal and adaptive control, programming methods, numerical integration, optimization methods, multiprocessor systems, agent systems, combinatorial problems, signal sampling and reconstruction, digital filter design.

Project:

Project is conducted in parallel with lectures. The students build shell-based expert system focusing on knowledge acquisition, rule-based knowledge representation and inference system.

20. Examination: no

21. Primary sources:

1. P. Harmon, R. Maus, W. Morrissey, Expert systems tools and applications, John Wiley & Sons, 1988.
2. G. F. Luger, W. A. Stubblefield, Artificial Intelligence: Structures for Complex Problem Solving, Addison Wesley Longman, 1999.
3. A. Niederliński, rmes Rule- and Model-Based Expert Systems, Jacek Skalmierski Computer Studio 2008.
4. S. J. Russell, P. Norvig, Artificial Intelligence: A Modern Approach. Prentice Hall, 2003.

22. Secondary sources:

1. M. Meystel, J. S. Albus, Intelligent Systems. Architecture, Design and Control, John Wiley & Sons, 2002.
2. J. Mulawka, Systemy ekspertowe, WNT Warszawa 1996.
3. W. Cholewa, W. Pedrycz, Systemy doradcze, Wydawnictwo Politechniki Śląskiej, 1987.

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/15
2	Classes	0/0
3	Laboratory	0/0
4	Project	15/15
5	BA/ MA Seminar	0/0
6	Other	5/5
	Total number of hours	35/35

24. Total hours: 70

25. Number of ECTS credits: 3

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

26. Comments:

Approved:

.....
(date, Instructor's signature)

.....
(date, the Director of the Faculty Unit signature)