FACULTY W-8 / DEPARTMENT………………

SUBJECT CARD

Name in Polish Systemyekspertowe
Name in English   Expert Systems
Main field of study (if applicable): Informatyka
Specialization (if applicable): Computer Engineering
Level and form of studies: ~~1st~~/ **2nd* level, full-time /** ~~part-time~~*****
Kind of subject: ~~obligatory~~ **/ optional /** ~~university-wide~~*****
Subject code INZ0165Wl
Group of courses YES / ~~NO~~*****

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30		30		
Number of hours of total student workload (CNPS)	60		120		
Form of crediting	Examination / ~~crediting with grade~~*	Examination / crediting with grade*	~~Examination~~ / crediting with grade*	Examination / crediting with grade*	Examination / crediting with grade*
For group of courses mark (X) final course	X				
Number of ECTS points	3		3		
including number of ECTS points for practical (P) classes			3		
including number of ECTS points for direct teacher-student contact (BK) classes	1,8		1,8		

*delete as applicable

 PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES
1. Basic knowledge of logics and set theory.

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SUBJECT OBJECTIVES
C1 Acquiring knowledge on history, architecture and tasks of expert systems as well as on typical methods of knowledge representation and processing.
C2 Developing skills in implementing simple knowledge bases and reasoning algorithms in declarative programming languages (e.g. Prolog).

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Student can present the idea and structure of an expert system, and the idea of a knowledge representation.

PEK_W02 Student can describe models and methods of expert systems based on two-value logics.

PEK_W03 Student can describe models and methods of expert systems based on multi-value logics and of expert systems automatically updating their knowledge base.

relating to skills:

PEK_U01 Student is capable of implementing and querying a knowledge base containing propositions, using a declarative programming language (e.g. Prolog) – in laboratory conditions.

PEK_U02 Student is capable of implementing and querying a knowledge base containing predicates, using a declarative programming language (e.g. Prolog) – in laboratory conditions.

PEK_U03 Student is capable of implementing fuzzy rules and the algorithm for processing them, using a chosen software package in laboratory conditions.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec1	History, application areas and perspectives of automated reasoning and expert systems.	2
Lec2	Basic components and structure of expert systems.	2
Lec3	Main tasks corresponding to the roles of: a user, a designer, an expert, a knowledge engineer, a programmer.	2
Lec4, Lec5	Expert systems based on relational knowledge representation.	4
Lec6 – Lec8	Expert systems based on logical knowledge representation (propositional logic).	6
Lec9 – Lec11	Expert systems based on predicate calculus.	6
Lec12 – Lec14	Application of other logics (fuzzy, modal) and hybrid approaches.	6
Lec15	Knowledge validation and updating. Learning in expert systems.	2
	Total hours	30
Form of classes - class		Number of hours
Cl 1		
Cl 2		
Cl 3		
Cl 4		
..		
	Total hours	
Form of classes - laboratory		Number of hours

Lab1	Explaining safety rules (BHP training).	1
Lab1 – Lab5	Implementation and querying propositional knowledge base in Prolog programming language.	9
Lab6 – Lab10	Implementation and querying predicative knowledge base in Prolog programming language.	10
Lab11 – Lab15	Implementing fuzzy rules and the algorithm for processing them, in a chosen software package.	10
	Total hours	30

Form of classes - project		Number of hours
Proj1		
Proj2		
Proj3		
Proj4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem1		
Sem2		
Sem3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Traditional lecture. N2. Group work – discussion, conversation with an individual student. N3. Students' individual work – programming. N4. Students' individual work – performing computer simulations. N5. Students' individual work – studying literature. N6. Students' individual work – analyzing, designing.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation(F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
F1 (lecture)	PEK_W01 – PEK_W03	Examination
F2 (laboratory)	PEK_U01 – PEK_U03	Monitoring students' activity and observance of safety and laboratory rules. Conversations with individual students concerning current laboratory exercises (incl. presentation of computer programs, computed resultsand conclusions), a report.
P1 (lecture and	PEK_W01 –	(2*F1 + F2) / 3, F1, F2> 2

laboratory as per GK)	PEK_W03, PEK_U01 – PEK_U03	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1]
[2]
[3]
[4]

SECONDARY LITERATURE:

[1] Z. Bubnicki "Analysis and Decision Making in Uncertain Systems", Springer Verlag, 2004
[2] Z. Bubnicki "Modern Control Theory", Springer Verlag, 2005
[3] T. Mitchell "Machine Learning", McGraw-Hill, 1997
[4] Journal articles on expert systems available through WUT librarian system.

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Expert Systems
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Informatyka
AND SPECIALIZATION ComputerEngineering

Subjecteducationaleffect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**	Subjectobjectives***	Programmecontent***	Teachingtoolnumber***
PEK_W01 (knowledge)	K2INF_W06	C1	Lec1 – Lec3	N1, N5
PEK_W02	K2INF_W06	C1	Lec4 – Lec11	N1, N5
PEK_W03	K2INF_W06	C1	Lec12 – Lec15	N1, N5
PEK_U01 (skills)	K2INF_U08, K2INF_U09	C2	Lab1 – Lab5	N2 – N6
PEK_U02	K2INF_U08, K2INF_U09	C2	Lab6 – Lab10	N2 – N6
PEK_U03	K2INF_U08, K2INF_U09	C2	Lab11 – Lab15	N2 – N6

** - enter symbols for main-field-of-study/specialization educational effects

*** - from table above