Zał. nr 4 do ZW 64/2012

FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish …Zaawansowane elementy sztucznej inteligencji….
Name in English … Advanced Topics in Artificial Intelligence ….
Main field of study (if applicable): …….
Specialization (if applicable): … Computer Engineering (CE)
Level and form of studies: ~~1st/~~ 2nd* level, full-time / ~~part-time~~*
Kind of subject: obligatory / ~~optional / university-wide~~*
Subject code INZ0110Wp
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)	90			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					
Number of ECTS points	4			3	
including number of ECTS points for practical (P) classes	0			3	
including number of ECTS points for direct teacher-student contact (BK) classes	2,4			1,8	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. K2INF_W06_S2CE_W04
2. K2INF_U08_S2IT_U06
3.

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SUBJECT OBJECTIVES

C1 Extend and deepen the knowledge of intelligent methods, their uses and methods of validation
C2 The ability to select appropriate intelligent techniques and their validation to the task

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 Awareness of the role of creative thinking and knowledge representation
PEK_W02 Issues connected with Machine Learning task
PEK_W03 Issues connected with imprecise knowledge
…
relating to skills:
PEK_U01 The ability to formulate problems in a way that facilitates its solution

PEK_U02 Skilful selection of intelligent techniques to the given problem
PEK_U03 The intelligent processing of imprecise knowledge
…
relating to social competences:
PEK_K01 Cooperation in group
PEK_K02

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours**
Lec 1	Introduction to the course. What is Artificial Intelligence? A historical perspective and recent trends	2
Lec 2	Brain, Knowledge representation and processing, brain modeling. Memory as an association net. Gestalt principles of perception.	2
Lec 3	Problems: representation, re-representation and solving. Creative thinking	2
Lec 4	Supervised learning: inductive learning - learning version space. Induction of decision trees, ID3 and C4.5	2
Lec 5	Transformation and selection of attributes	2
Lec 6	Induction of rules covering sequential approach, the algorithm AQ, CN2, ILA	2
Lec 7, Lec8	Teams classifiers and clustering methods (Ensemble of Classifiers, clustering ensemble)	4
Lec 9, Lec 10	Statistical learning - selected methods	4
Lec 11	Reinforcement Learning - idea, methods	2
Lec 12	Learning from cases (Instance Based Learning)	2
Lec 13	Reasoning with uncertainty – rough sets theory	2
Lec 14	Evolutionary computation in data mining tasks	2
Lec 15	Summary of material, new directions.	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**
Lab 1		
Lab 2		
Lab 3		
Lab 4		
Lab 5		
…		
	Total hours	

Form of classes - project	**Number of hours**

Proj 1	Discussion about possible subjects of the project, teams, requirements	2
Proj 2	Decision and consultation about the project subject, its scope, etc.	2
Proj 3	Detailed plan of the project, consultation of used methods, approaches, etc.	6
Proj 4	Projects plan and progress presentation	4
Proj 5	Project realization and consultation	10
Proj 6	Student presentations of the project results	4
Proj 7	Summarization of the presented projects	2
	Total hours	30

Form of classes - seminar		**Number of hours**
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Presentations with projectors
N2. E-learning system used for the publication of teaching materials
N3. Discussion

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 Project presentation in the middle of semester	PEK_U01 PEK_U02	Student can receive 10 point max. The presentation of the problem itself and the planned approach to solve the problem is evaluated.
F2 Presentation of the final results of the project	PEK_U02 PEK_U03 PEK_K01	Student can receive 20 point max. The presentation of the problem itself and the planned approach to solve the problem is evaluated.
P1 Final grade of the project	PEK_U02 PEK_U03 PEK_K01	Points for the presentations and additional 10 points for the student's activity during the semester is summed. The final evaluation will be issued in accordance with the following scale: % of points: grade [0%, 50%]: 2.0 [50%+1 point, 60%): 3.0 [60%, 70%): 3.5 [70%, 80%): 4 [80%, 90%): 4.5 [90%, 100%]: 5.0
P2	PEK_W01 PEK_W02 PEK_W03	Exam. The exam is a written exam, checking knowledge of the lecture and the ability for practical use of this knowledge. It consists of open-ended questions, with known points for each. The student to pass the course should obtain more than 50% of all possible points

		(50%+1 point). % of points: grade [0%, 50%]: 2.0 [50%+1 point, 60%): 3.0 [60%, 70%): 3.5 [70%, 80%): 4 [80%, 90%): 4.5 [90%, 100%]: 5.0
C		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Mitchell Tom M., Machine Learning. McGraw-Hill companies, Inc., 1997.
[2] Jiawei Han: Data mining : concepts and techniques. Morgan Kaufmann Publishers, 2000.
[3] Russell S., Norvig P., Artificial Intelligence: A Modern Approach. 2nd Ed. Copyright © 2002. Prentice Hal
[4]

SECONDARY LITERATURE:

[1] MAIMON O., ROKACH L.: Data Mining and Knowledge Discovery Handbook. Springer, 2006.
[2] Introduction to Machine Learning. Draft, Nils J. Nilsson http://ai.stanford.edu/~nilsson, 2010. Stanford University
[3] Arnold Lewis Glass, Keith James Holyoak, John Lester Santa: Cognition, Addison Wesly Pub. Comp., 1997

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

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
… Advanced Topics in Artificial Intelligence **…**
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
……..
AND SPECIALIZATION … Computer Engineering (CE) ..

Subject educational effect	**Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)****	**Subject objectives*****	**Programme content*****	**Teaching tool number*****
PEK_W01 (knowledge)	K2INF_W06_S2CE_W02	C1	Lec 1- Lec 15;	N1-N2
PEK_W02	K2INF_W06_S2CE_W02	C1	Lec 1- Lec 15;	N1-N2
PEK_W03	K2INF_W06_S2CE_W02	C1	Lec 1- Lec 15;	N1-N2
…				
PEK_U01 (skills)	K2INF_U08_S2CE_U05	C2	Proj 1 – Proj 7	N1, N3
PEK_U02	K2INF_U08_S2CE_U07	C2	Proj 1 – Proj 7	N1, N3
PEK_U03	K2INF_U08_S2CE_U09	C2	Lec 1 – Lec 15; Proj 1 – Proj 7	N1, N2, N3
PEK_K01 (competences)	K2INF_U08_S2CE_U09	C2	Proj 1 – Proj 7	N1, N3
PEK_K02				
…				

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