FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

SUBJECT CARD

Name in Polish: Eksploracja danych
Name in English: Data Mining
Main field of study (if applicable): Management
Specialization (if applicable): Business Information Systems (BIS)
Level and form of studies: 2nd level, full-time
Kind of subject: obligatory
Subject code: IEZ2203
Group of courses NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	**15**			**30**	
Number of hours of total student workload (CNPS)	**90**			**60**	
Form of crediting	**Examination with grade**			**Crediting with grade**	
For group of courses mark (X) final course					
Number of ECTS points	**3**			**2**	
including number of ECTS points for practical (P) classes				**2**	
including number of ECTS points for direct teacher-student contact (BK) classes	**0,5**			**1**	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES
1. Student has a basic knowledge of statistical tools.
2. Student has a basic practical skills in working with statistical software.

\

SUBJECT OBJECTIVES
C1. Acquisition of data mining knowledge in business management processes.
C2. Getting skills in choosing and using decision support techniques in practical business problems solving.
C3. Getting social skills in information and communication techniques for management.

SUBJECT EDUCATIONAL EFFECTS
relating to knowledge:
PEK_W01: Student has a basic knowledge in construction and using some quantitative
methods and computer technics in data mining useful in business information systems.
PEK_W02: Student has a basic knowledge in applying software in data mining.

relating to skills:
PEK_U01: Student can collection data for decision problem.
PEK_U02: Student can identify and propose ways of solving data mining problems.
PEK_U03: Student is able to build useful tools for data analysis for business decision
processes.

relating to social competences:

PEK_K01: Student can enlarge his knowledge and abilities, can works in groups for solving management data mining problems.

PEK_K02: Student can find methods for solving decision problems, held accountable for his works, defend his views of the propose way of solving problems.

PROGRAMME CONTENT	
Form of classes - lecture	**Number of hours**
Lec 1 Data mining – methods and practical applications: examples.	1
Lec 2 Pre-processing.	2
Lec 3 Cluster analysis: nearest (Furthest) algorithm, group average (median) algorithm.	2
Lec 4 k-means algorithm.	2
Lec 5 Hierarchical classification algorithms.	2
Lec 6 Classification and decision trees: CART, C4.5, C5.0 algorithms.	2
Lec 7 Regression trees.	2
Lec 8 Association Methods: A priori methods, FP-growth algorithm, one attribute rule algorithm.	2
Total hours	15
Form of classes - class	**Number of hours**
Form of classes - laboratory	**Number of hours**
Form of classes - project	**Number of hours**
Proj 1 Data collection; team work.	2
Proj 2 Pre-processing data; team work.	2
Proj 3 Nearest (Furthest) algorithm implementation; team work.	2
Proj 4 k-Means algorithm implementation; team work.	2
Proj 5 Group average (median) algorithm implementation; team work.	2
Proj 6 Hierarchical classification algorithm implementation; team work.	2
Proj 7; Proj 8 Comparison results of cluster and classification algorithms; team work.	4
Proj 9 Presentation result; team work.	2

Proj 10, Proj 11	Classification and regression tree implementation; team work.	4
Proj 12	Comparison results of classification algorithms; team work.	2
Proj 13	Presentation result; team work.	2
Proj 14	Choosing the best method; team work.	2
Proj 15	Final presentation; team work.	2
	Total hours	30

Form of classes - seminar	Number of hours

TEACHING TOOLS USED

N1. Multimedia presentation .
N2. Data collection.
N3. Computer data analysis.
N4. Team work.
N5. Written test (exam).

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	PEK_U01	Report
F2	PEK_U01, PEK_U02, PEK_U03 PEK_K01, PEK_K02	Team presentation
P1	PEK_W01, PEK_W02	Written test.
P2	PEK_U01, PEK_U02, PEK_U03	Report of team work.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] David H., Heikki M., Padhraic S., *Data Mining*, MIT, 2001.

[2] Han J., Kamber M.: *Data Mining. Concept and Techniques*, Elsevier Morgan Kaufmann Publishers, 2006.

[3] Han J., Jiawei : Data Mining: Concepts and Technics, 2006.

[4] Larose D.T.: *Discovering Knowledge in Data Analysis. An Introduction to Data Mining*, John Wiley & Sons, 2005.

[5] Shmueli, Galit, Data Mining for Business Intelligence: Consepts, Techniques, and Applications in Microsoft Office Excel with XLMiner, Wiley-Interscience, 2006.

[6] Sumathi S., Introduction to Data Mining and Its Application, 2006.

SECONDARY LITERATURE:

[1] Cooc D.J., Holder L.B.: *Mining Graph Data, Hoboken*, N.J. : Wiley-Interscience, 2007.

[2] Morrison D.F.: *Multivariate Statistical Methods*, McGrow-Hill, 1990.

[3] Olson D.L. *Advance Data Mining Techniques*, Springer, 2008.

[4] Larose D. T., *Data Mining methods and Models*, IEEE Computer Society Press, 2006.

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

Barbara Gładysz; e-mail: barbara.gladysz@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Data Mining
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Management
AND SPECIALIZATION Business Information Systems

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)	K2_ZARZ_W08 S2_BIS_W01	C1, C2	Lec01, Lec02, Lec03, Lec 04, Lec 05, Lec 06, Lec07, Lec 08	N1, N5
PEK_W02 (knowledge)	K2_ZARZ_W08 S2_BIS_W01	C1, C2	Lec01, Lec02, Lec03, Lec04, Lec05, Lec 06, Lec07, Lec08	N1, N5
PEK_U01 (skills)	K2_ZARZ_U03	C1, C2	Proj01	N2, N4
PEK_U02 (skills)	K2_ZARZ_U03 S2_BIS_U01	C1, C2	Proj02, …,Proj15	N1, N3, N4
PEK_U03 (skills)	K2_ZARZ_U03 S2_BIS_U01	C1, C2	Proj02, …,Proj15	N1, N3, N4
PEK_K01 (social competencies)	K2_ZARZ_K01 K2_ZARZ_K02 K2_ZARZ_K05	C3	Proj01, …,Proj15	N4
PEK_K02 (social competencies)	K2_ZARZ_K01 K2_ZARZ_K02 K2_ZARZ_K05	C3	Proj01, …,Proj15	N4