

**FACULTY OF COMPUTER SCIENCE AND MANAGEMENT****SUBJECT CARD****Metody i narzędzia analizy danych****Methods and Tools of Data Analysis****Main field of study (if applicable): Management****Specialization (if applicable): Organizational Management (OM)****Level and form of studies: 1<sup>st</sup> level, full-time****Kind of subject: obligatory****Subject code ZMZ1253****Group of courses NO**

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

\*delete as applicable

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Student has a basic knowledge of business management and decision making process. He has a general knowledge of information technics in management.
2. Student knows basic software for solving management problems, specially designed for decision making.
3. Student has a basic practical skills in working with Excel and SQL 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 identify and propose ways of solving data mining problems.  
 PEK\_U02: 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.	2
Lec 2	Pre-processing.	2
Lec 3	Multivariate analysis.	2
Lec 4	Decision trees.	2
Lec 5	Regression trees.	2
Lec 6	Seasonal decomposition in forecasting.	2
Lec 7	Association rules methods.	2
Lec 8	Written test.	1
	Total hours	15
Form of classes - class		Number of hours
Form of classes - laboratory		Number of hours
Lab 1	Get acquainted with data warehouse	2
Lab 2	Data analysis – OLAP elements.	2
Lab 3	Warehouse data pre-processing.	2
Lab 4	Team work: Sale seasonal analysis. Results presentation.	2
Lab 5	Team work: Sale multivariate analysis. Results presentation.	2
Lab 6	Team work: Regression tree construction. Results presentation.	2
Lab 7	Team work: Association rules for sale construction. Results presentation.	2
Lab 8	Test with computer.	1
	Total hours	15
Form of classes - project		Number of hours
Form of classes - seminar		Number of hours

### TEACHING TOOLS USED

- N1. Multimedia presentation .
- N2. Team work.
- N3. Computer data analysis.
- N4. Laboratory instruction.
- N5. Written test.
- N6. Computer test.

**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, PEK_U02 PEK_K01, PEK_K02	Report of team work results.
P1	PEK_W01	Written test.
P2	PEK_U01, PEK_U02	Computer test.

**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: Concepts, 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*, McGraw-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)**

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
Methods and Tools of Data Analysis  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Management  
AND SPECIALIZATION Organizational Management**

<b>Subject educational effect</b>	<b>Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)**</b>	<b>Subject objectives***</b>	<b>Programme content***</b>	<b>Teaching tool number***</b>
PEK_W01 (knowledge)	S1_ZARZ_OM_W09	C1, C2	Lec01, Lec02, Lec03, Lec 04, Lec 05, Lec 06, Lec07	N1, N5
PEK_W02 (knowledge)	S1_ZARZ_OM_W09	C1, C2	Lec01, Lec03, Lec 04, Lec 05, Lec 06, Lec07	N1, N5
PEK_U01 (skills)	S1_ZARZ_OM_U09	C1, C2	La01, Lab02, La03, La04, La05, La06, Lab07	N2, N3, N6
PEK_U02 (skills)	S1_ZARZ_OM_U09	C1, C2	La04, La05, La06, Lab07	N2, N3, N6
PEK_K01 (social competencies)	K1_ZARZ_K02	C3	La01, Lab02, La03, La04, La05, La06, Lab07	N3
PEK_K02 (social competencies)	K1_ZARZ_K02	C3	La01, Lab02, La03, La04, La05, La06, Lab07	N3

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

\*\*\* - from table above