Course name : **Data Mining**		
Type of study: **Computer science**	Type of study: **Full-time**	Course code: **ZSZ2_04**
Course characteristics: **Mandatory within the additional content**	Level: **Second (M.Sc.)** **(Enterprise Resource Planning and Data Analytics Systems)**	Year: I Semester: Y
Type of classes: **lectures, laboratories**	Hours per week: **2 lect, 2 lab**	ECTS points: **5 ECTS**

COURSE GUIDE

AIMS

A1. Introducing the students to the basics of data analysis and exploration, application of analytical databases and OLAP cubes.

A2. Knowledge needed to selection, implementation presented solutions and data analysis methods.

A3. Practical skills in application of Business Intelligence.

PREREQUISITES

1. Knowledge of the design and administration of databases.
2. Personal computer operating systems literacy.
3. Ability to program in any high level language.
4. Basic knowledge of programming in a database environment.
5. Ability to use different sources of information and technical documentation.
6. Ability to work independently and in a group.
7. Ability to correctly interpret and present their own activities.

LEARNING OUTCOMES

EE 1 – has basic theoretical knowledge in the field of knowledge discovery methods in data structures,

EE 2 – has a basic knowledge of data warehouse,

EE 3 – has basic knowledge about the design of Business Intelligence,

EE 4 – knows the technology and tools for the tasks related to the mining of the knowledge contained in analytical databases,

EE 5 – able to select appropriate algorithms for data analysis depending on the problem and to implement them,

EE 6 – can design appropriate diagrams to organize information using known tools,

EE 7 – is able to propose a solution to a specific issue related to data mining.

CONTENT

Lectures	Hours
Lect. 1 - Introduction to the analysis and data mining	**2**
Lect. 2 - Data Warehousing – architecture	**2**
Lect. 3 - OLAP Technology – OLAP cubes	**2**

Lect. 4 - Introduction to MDX	**2**
Lect. 5 - MDX expressions	**2**
Lect. 6 - Server SSAS – the basics of working in the environment and automate administrative tasks, part 1	**2**
Lect. 7 - Server SSAS – the basics of working in the environment and automate administrative tasks, part 2	**2**
Lect. 8 - Introduction to the basic techniques of data mining	**2**
Lect. 9 - Application of data mining techniques – classification	**2**
Lect. 10 - Application of data mining techniques – regression	**2**
Lect. 11 - Application of data mining techniques – segmentation	**2**
Lect. 12 - Application of data mining techniques – association	**2**
Lect. 13 - Application of data mining techniques – sequential analysis	**2**
Lect. 14 - Application of data mining techniques – forecasting	**2**
Lect. 15 - Reading and evaluation of results – visualization and reporting	**2**
LABORATORIES	Hours
Lab. 1 - Introduction to the SQL Server environment and tools used in the data analysis process.	**2**
Lab. 2 - Project of simple analytical databases and analytical cubes.	**2**
Lab. 3 - Installing and getting to know the structure of the sample data warehouse.	**2**
Lab. 4 - Basic MDX expressions used during data processing.	**2**
Lab. 5 - MDX - use of additional built-in functions of language.	**2**
Lab. 6 - Server SSAS - monitoring the work and safety - roles, permissions, etc. SQL Server Profiler.	**2**
Lab. 7 - SQL Server Agent, XMLA.	**2**
Lab. 8 - Data analysis using Excel.	**2**
Lab. 9 - Practical use of classification.	**2**
Lab. 10 - Practical use of regression.	**2**
Lab. 11 - Practical use of segmentation.	**2**
Lab. 12 - Practical use of association.	**2**
Lab. 13 - Practical use of sequential analysis.	**2**
Lab. 14 - Practical use of forecasting.	**2**
Lab. 15 - Methods of presentation and results evaluation.	**2**

TEACHING TOOLS

1. – lectures using multimedia presentations
2. – blackboard and chalk or whiteboards and pens
3. – laboratory guides
4. – reports from laboratory activities
5. – computers with software

LITERATURE

Mark Hall, Ian Witten, Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, Morgan Kaufmann 2011.
D. J. Hand, Heikki Mannila, Padhraic Smyth, Principles of Data Mining, MIT Press, 2001
Jamie MacLennan, ZhaoHui Tang, Bogdan Crivat, Data Mining with Microsoft SQL Server

2008, John Wiley & Sons

TEACHERS

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ADDITIONAL NOTES

Links to course unit teaching materials can be found on the http://iisi.pcz.pl/ website for current students.