

FACULTY W8 / DEPARTMENT.....					
SUBJECT CARD					
Name in Polish		Hurtownie Danych			
Name in English		Data Warehouses			
Main field of study (if applicable):		Computer Science			
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		INZ0164Wlp			
Group of courses		YES / NO*			
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15		30	15	
Number of hours of total student workload (CNPS)	30		120	30	
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	1		4	1	
including number of ECTS points for practical (P) classes			4	1	
including number of ECTS points for direct teacher-student contact (BK) classes	0,6		2,4	0,6	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of database system, with a particular focus on the relational model.
2. At least basic knowledge of SQL query language

SUBJECT OBJECTIVES

- c1. Has basic knowledge on Business Intelligence systems.
- c2. Has basic knowledge on transaction oriented processing (OLTP) and analytic oriented processing (OLAP).
- c3. Has basic skills of determining type of processing (transaction vs analytic), including the ability to determine business needs and requirements.
- c4. Has basic knowledge on multidimensional data model and basics of data warehousing
- c5. Has basic skills of data warehouse usage, including design of data warehouses
- c6. Has basic knowledge on data integration, reporting and visualisation
- c7. Has basic skills of data integration process design
- c8. Has basic skills of report generation and analysis
- c9. Has basic knowledge on data analysis
- c10. Has basic skills of data analysis tools usage

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 has basic knowledge on Business Intelligence

PEK_W02 has basic knowledge on data warehouses, including data warehouse design

PEK_W03 has basic knowledge on data integration process

PEK_W04 has basic knowledge on reporting and data analysis

relating to skills:

PEK_U01 can design and implement data integration process

PEK_U02 can design and implement basic data warehouse

PEK_U03 can conduct basic data analysis

PEK_U04 can design and implement simple reports, including different data visualisation methods

PEK_U05 observes occupational health and safety rules

relating to social competences:

PEK_K01 can acquire information from literature, and/or search for other sources

PEK_K02 understands the need for regular and constant work focused on course's material

PEK_K03 can identify basic usage of data warehouses, reporting and data visualization in different business processes

PROGRAMME CONTENT

Form of classes - lecture		Number of hours
Lec 1	Course details Business Intelligence Issues	2
Lec 2	Transaction vs analytic needs, processes and data sources	2
Lec 3	Multidimensional data model Basics of data warehousing	2
Lec 4	Data warehouse – design, including multidimensional modelling	2
Lec 5	ETL process	2
Lec 6	Data analysis, reporting and visualisation	2
Lec 7	Data analysis tools and techniques	2
Lec 8	Test	1
	Total hours	15
Form of classes - class		Number of hours
Cl 1		
..		
	Total hours	
Form of classes - laboratory		Number of hours
Lab 1	Course Details (Health and Safety Training, Course requirements)	1
Lab 2	SQL basics	1
Lab 3	Analysis of analytical needs Analysis of operational databases	2
Lab 4	ETL process – data extraction	2
Lab 5	ETL process – implementation, data transformation	2
Lab 6	Multidimensional data implementation – ROLAP ETL process – data loading	2

Lec 7	Analytical processing – SQL	2
Lec 8	Multidimensional data implementation – MOLAP ETL process –data loading	2
Lec 9	Using MOLAP	2
Lec 10	Analytical processing – MDX	2
Lec 11	Reporting	2
Lec 12	Data visualisation	2
Lec 13	Advanced reporting	2
Lec 14	Data analysis I	2
Lec 15	Data analysis II	2
	Total hours	30
Form of classes - project		Number of hours
Proj 1	Course details.	1
Proj 2	Operational data analysis – data sources for data warehouse	2
Proj 3	Analytical needs analysis Multidimensional data design	2
Proj 4	ETL process design and implementation	2
Proj 5	Data warehouse design	2
Proj 6	Data warehouse implementation	2
Proj 7	Reporting and data visualisation design and implementation	2
Proj 8	Data analysis design and implementation	2
	Total hours	15
Form of classes - seminar		Number of hours
Sem 1		
...		
	Total hours	
TEACHING TOOLS USED		
N1. Lecture – traditional method with multimedia content N2. Group work – discussion. N3. Computer laboratory – traditional method with multimedia content N4. Student's individual work – preparations to laboratories, literature studies		

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_U06	Student assessment – individual discussion including laboratory result presentation, conclusions, etc.
F2	PEK_U01-PEK_U06	Student assessment – individual discussion including project result presentation, conclusions, etc.
P1	PEK_W01-PEK_W04	Test
P2	PEK_U01-PEK_U06	Student assesment – summary

PRIMARY AND SECONDARY LITERATURE
<u>PRIMARY LITERATURE:</u> <ol style="list-style-type: none">1. Jensen C.S., Pedersen T.B., Thomsen C., Multidimensional Databases and DataWarehousing, Morgan & Claypool Publishers series SYNTHESIS LECTURES ON DATA MANAGEMENT, 20102. Rainardi V., Building a Data Warehouse With Examples in SQL Server, Apress, 20083. Harinath S., Pihlgren R., Lee D.G.-Y., Sirmon J., Bruckner R.M., PROFESSIONAL MICROSOFT® SQL SERVER® 2012 ANALYSIS SERVICES WITH MDX AND DAX, John Wiley & Sons, Inc., 20124. Microsoft SQL Server 2012 Integration Services, APN Promise, 20125. Inmon W., Building the Data Warehouse, John Wiley & Sons, New York 20026. Kimball R., Caserta J., The Data Warehouse ETL Toolkit, Wiley Publishing, Inc, 2004 <u>SECONDARY LITERATURE:</u> <ol style="list-style-type: none">1. Aspin A., SQL Server 2012 Data Integration Recipes, Apress, 20122. Leonard A., Masson M., Mitchell T., Moss J.M., Ufford M., SQL Server 2012 Integration Services Design Patterns, Apress, 20123. Claudia Imhoff, Nicholas Gallempo, Jonathan G. Geiger, Mastering Data Warehouse Design, Wiley Publishing, Inc., 20034. MacLennan J., Tang ZH., Crivat B., Data Mining with SQL Server 2008, Wiley Publishing, Inc, 2009 <u>SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)</u> <p>Dr inż. Wojciech Lorkiewicz, wojciech.lorkiewicz@pwr.wroc.pl</p>

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR
SUBJECT
Data Warehouses
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY
Computer Science
AND SPECIALIZATION **Computer Engineering**

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	C1-C3	Lec1-2, Proj2	N1
PEK_W02	K2INF_W06	C4-5	Lec3-4, Proj2-8	N1
PEK_W03	K2INF_W06	C6-7	Lec5, Proj4	N1
PEK_W04	K2INF_W06	C8-10	Lec6-7, Proj7-8	N1
PEK_U01 (skills)	K2INF_U08	C6	Lab4-6, Lab8, Proj4	N2,N3,N4
PEK_U02	K2INF_U08	C2-9	Lab3, Proj2-8	N2,N3,N4
PEK_U03	K2INF_U08	C9-10	Lab14-15, Proj8	N2,N3,N4
PEK_U04	K2INF_U08	C6, C8	Lab11-13, Proj7	N2,N3,N4
PEK_U05	K2INF_U08, K2INF_U09		Lab1, Lec1, Proj1	N2,N3,N4
PEK_K01 (competences)		C1-2,C4,C6,C9	Lec1-7, Lab2-15, Proj2-8	
PEK_K02			Lec1-7, Lab2-15, Proj2-8	
PEK_K03			Lec1-2, Proj2-3, Lab3	

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

*** - from table above