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):
Level and form of studies: **1st/ 2nd* level, full-time / part-time***
Kind of subject: **obligatory / optional / university-wide***
Subject code   **INZ0268Wl**
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)	60		90		
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	2		3		
including number of ECTS points for practical (P) classes			2		
including number of ECTS points for direct teacher-student contact (BK) classes	1,2		1,8		

*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 skills of using SQL grouping operators, and SQL aggregation and grouping functions.
c3. Has basic knowledge on transaction oriented processing (OLTP) and analytic oriented processing (OLAP).
c4. Has basic skills of determining type of processing (transaction vs analytic).
c5. Has basic knowledge and skills of using data warehouses.
c6. Knows basics of MS PowerPivot, MS SQL Analysis Services, MS SQL Integration Services and MS SQL Reporting Services.
c7. Has basic knowledge on data integration, reporting and visualisation.
c8. Has basic skills of integrating, reporting and visualising data.
c9. Knows typical Business Intelligence applications.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:
PEK_W01 has basic knowledge on data warehouse usage
PEK_W02 has basic knowledge on data warehouse organisation – logical and physical
PEK_W03 has basic knowledge on ETL process, reporting and data analysis

relating to skills:
PEK_U01 can use SQL grouping operators and SQL grouping and aggregating functions
PEK_U02 can design and implement a ETL process
PEK_U03 can design and implement a simple data warehouse
PEK_U04 can design and implement basic reports, using different data visualisation methods
PEK_U05 can use basic MDX queries
PEK_U06 can analyse available Business Intelligence applications
PEK_U07 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. Introduction to Business Intelligence.	2
Lec 2	SQL grouping operators. SQL agregating and grouping functions.	2
Lec 3	Transaction vs analytic needs, processes and data sources	2
Lec 4	Multidimensional data model – logical organisation	2
Lec 5	Data warehouses – basics	2
Lec 6	ETL proces	2
Lec 7	Data warehouse – logical organisation	2
Lec 8	Data warehouses – architecture	2
Lec 9	MDX queries	2
Lec 10	Multidimensional data model – physical organisation	2
Lec 11	Reporting	2
Lec 12	Data visualisation	2
Lec 13	Data warehouse – design basics	2
Lec 14	Web dashboards	2
Lec 15	Test	2
	Total hours	**30**

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	MS PowerPivot; pivot tables and pivot graphs	1
Lab 3	SQL aggregation and SQL grouping functions. SQL grouping operators	2
Lab 4	MS SQL Integration Services – data cleansing	2
Lab 5	MS SQL Integration Services – data integration	2
Lab 6	MS SQL Analysis Services – basics	2
Lab 7	MS SQL Analysis Services – desing and implementation	2
Lab 8	MS SQL Analysis Services – advanced topics	2
Lab 9	MS SQL Analysis Services – MDX basics	2
Lab 10	MS SQL Analysis Services – advanced MDX	2
Lab 11	MS SQL Reporting Services – simple reporting	2
Lab 12	MS SQL Reporting Services – advanced reporting	2
Lab 13	Business Intelligence applications – web dashboard systems (QlikView)	2
Lab 14	Business Intelligence applications – ETL tools, OLAP servers (group presentation)	2
Lab 15	Business Intelligence applications – reporting tools (group presentation)	2
Lab 16	Test	2
	Total hours	**30**

Form of classes - project		Number of hours
Proj 1		
…		
	Total hours	

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; including student's multimedia presentation of a selected topic 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_U07	Student assessment – individual discussion including result presentation, conclusions, etc.
C1	PEK_W01-PEK_W03	Test

C2	PEK_U01-PEK_U07	Student assessment - summary

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

1. Jensen C.S., Pedersen T.B., Thomsen C., Multidimensional Databases and DataWarehousing, Morgan & Claypool Publishers series SYNTHESIS LECTURES ON DATA MANAGEMENT, 2010
2. Rainardi V., Building a Data Warehouse With Examples in SQL Server, Apress, 2008
3. 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., 2012
4. Microsoft SQL Server 2012 Integration Services, APN Promise, 2012
5. Inmon W., Building the Data Warehouse, John Wiley & Sons, New York 2002
6. Kimball R., Caserta J., The Data Warehouse ETL Toolkit, Wiley Publishing, Inc, 2004

SECONDARY LITERATURE:

1. Aspin A., SQL Server 2012 Data Integration Recipes, Apress, 2012
2. Leonard A., Masson M., Mitchell T., Moss J.M., Ufford M., SQL Server 2012 Integration Services Design Patterns, Apress, 2012
3. Claudia Imhoff, Nicholas Galemmo, Jonathan G. Geiger, Mastering Data Warehouse Design, Wiley Publishing, Inc., 2003
4. MacLennan J., Tang ZH., Crivat B., Data Mining with SQL Server 2008, Wiley Publishing, Inc, 2009

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

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

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)	K1INF_W07	C1	Lec1-3, Lec13-14	N1
PEK_W02	K1INF_W07, K1INF_W15, K1INF_W22	C3, C5	Lec4-5, Lec7-8, Lec10, Lec13	N1
PEK_W03	K1INF_W07, K1INF_W15, K1INF_W16	C5, C7	Lec6, Lec9, Lec11-12	N1
PEK_U01 (skills)	K1INF_W16, K1INF_U03, K1INF_U05, K1INF_U16	C2	Lab3-4	N2-4
PEK_U02	K1INF_U03, K1INF_U04, K1INF_U05, K1INF_U13	C3-4, C6, C8	Lab5-6	N2-4
PEK_U03	K1INF_U03, K1INF_U04, K1INF_U05, K1INF_U13	C1, C5, C6	Lab5-13	N2-4
PEK_U04	K1INF_U03, K1INF_U04, K1INF_U05, K1INF_U13, K1INF_U16	C5-8	Lab12-15	N2-4
PEK_U05	K1INF_U05, K1INF_U11, K1INF_U16	C5-8	Lab10-11	N2-4
PEK_U06	K1INF_U03, K1INF_U04, K1INF_U05, K1INF_U11, K1INF_U13	C1, C9	Lab2,Lab14-15	N2-4
PEK_U07	K1INF_U14		Lec1, Lab1	
PEK_K01 (competences)	K1INF_U11	C1-9	Lab2-15 Lec1-14	N4
PEK_K02	K1INF_U05	C1-9	Lec15, Lab16	N2, N4
PEK_K03	K1INF_K02	C1-5,C8-9	Lec1, Lec3, Lec11-14 Lab14-15	N1, N3, N4

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

*** - from table above