FACULTY W-8/ DEPARTMENT………………

SUBJECT CARD

Name in Polish   **Bazy danych**
Name in English   **Databases**
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   **INZ0259Wcl**
Group of courses YES / NO*

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30	15	15		
Number of hours of total student workload (CNPS)	30	30	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	1	1	3		
including number of ECTS points for practical (P) classes	0	0	2		
including number of ECTS points for direct teacher-student contact (BK) classes	0,6	0,6	1,8		

*delete as applicable

 PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES
1. General IT knowledge
2. Computer skills

\

SUBJECT OBJECTIVES
C1 Gaining the basic knowledge about databases, data models and their implementation in a DBMS
C2 Acquisition of the ability to define and process data stored in databases

SUBJECT EDUCATIONAL EFFECTS
relating to knowledge:
PEK_W01 Describes the principles of data modeling at different levels of abstraction -> W07
PEK_W02 Presents basic transformation rules of data models and their verification -> W07
PEK_W03 Describes implementation rules of data models in a DBMS -> W07
PEK_W04 Presents the role and possibilities of using the SQL standard in a DBMS systems -> W16
PEK_W05 Defines the rules for defining architecture of database systems -> W22

relating to skills:

PEK_U01 Defines a conceptual data model using the UML -> U04

PEK_U02 Transforms conceptual data model into a physical model, taking into account the business rules and domain constraints -> U09

PEK_U03 Removes anomalies of data using the normalization process -> U09

PEK_U04 Defines queries using DML database languages and their implementation in a DBMS for searching and processing of data in databases -> U04, U19

PEK_U05 Knows and applies safety rules of working -> U14

PROGRAMME CONTENT	
Form of classes - lecture	**Number of hours**
Lec 1 Introduction - General Course Information – Concepts and Architecture	2
Lec 2 Data modeling at different levels of abstractions - aims, properties, languages of specifications	2
Lec 3 The Relational Data Model – definition, properties, constraints	2
Lec 4 The Relational Algebra	2
Lec 5 Functional Dependencies - Normal Forms - Normalization Process	2
Lec 6 Normalization Process cont.	2
Lec 7 Introduction to Data Definition Language (DDL)	2
Lec 8 Implementation of conceptual data models using the SQL standard DDL - basic information	2
Lec 9 DDL – Implementation of constraints	2
Lec 10 Introduction to Data Manipulation Language (DML), Transactions	2
Lec 11 DML - Data Modification (INSERT, UPDATE, DELETE)	2
Lec 12 DML Query - Joins, Subquery, Set Operations, Views	2
Lec 13 DML - Common Table Expressions, Stored Procedure, Triggers	2
Lec 14 NoSQL Databases	2
Lec 15 Test	2
Total hours	30
Form of classes - class	**Number of hours**
Cl 1 Introduction – Data - Data Models - DBMS	2
Cl 2 Data modeling – UML/ERD- (P01)	2
Cl 3 Examples of simple databases, Basic rules of transformation of data models	2
Cl 4 The Relational Algebra Operations - (P02)	2
Cl 5 Normalization process – 1NF, 2NF, 3NF - (P03)	2
Cl 6 Normalization process – BCNF, 4NF - (P03)	2
Cl 7 Transactions – Concurrency Control Technics - (P04)	2
Cl 8 Test	1
Total hours	15
Form of classes - laboratory	**Number of hours**

Lab 1	Health and safety training. Conditions of the course. Organization of work, Introduction to DBMS (P08)	2
Lab 2	Analysis of exemplary databases	2
Lab 3	DDL – creating simple database –"Our University" (Student, Course, Teacher, etc.) – (P05)	2
Lab 4	DML - INSERT, UPDATE, DELETE – (P06)	2
Lab 5	DML Query - Joins, Subquery, Set Operations, Views (P06)	2
Lab 6	DML - Common Table Expressions (P06)	2
Lab 7	Programming - Stored Procedure, Triggers, User Defined Functions (UDF) – (P07)	2
Lab 8	Test	1
	Total hours	15

Form of classes - project		Number of hours
Proj 1		
Proj 2		
Proj 3		
Proj 4		
…		
	Total hours	

Form of classes - seminar		Number of hours
Sem 1		
Sem 2		
Sem 3		
…		
	Total hours	

TEACHING TOOLS USED

N1. Lecture informative with elements of problem domains, supported by multimedia presentations and examples of solutions
N2. Database management systems
N3. E-learning system used for the publication of teaching materials and messages, and evaluate student work

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 – P01	PEK_U01	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F2 – P02	PEK_U01	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F3 – P03	PEK_U02 PEK_U03	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}

F4 – P04	PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F5 – P05	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F6 – P06	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F7 – P07	PEK_U03 PEK_U04	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F7 – P08	PEK_U05	Acceptable behavior in a lab.
C		Test of students' knowledge and skills of the discussed topics on the lectures. Evaluation of the abilities of solving the problems defined in the context of databases. On the positive evaluation: The student should gain average grade from classes and lab. at least **3.0** on the base of the following formula:

For the C row, the formula:

$$p. < 8,0 \quad \rightarrow 2.0$$
$$8,0 \leq p. < 9,5 \quad \rightarrow 3.0$$
$$9,5 \leq p. < 11 \quad \rightarrow 3.5$$
$$11 \leq p. < 12 \quad \rightarrow 4.0$$
$$12 \leq p. < 13 \quad \rightarrow 4.5$$
$$13 \leq p. \leq 14 \quad \rightarrow 5.0$$

- On the final test the student must solve at least 3 of the 5 tasks, and answer 2 out of 5 questions.

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Connolly T., Begg C., Database Systems. A Practical Approach to Design, Implementation, and Management 4th ed., Addison Wesley, 2005
[2] Celko J., SQL for Smarties. Advanced SQL Programming, 3th ed., Elsevier, 2005
[3] Elmasri R., Navathe S., Fundamentals of Database Systems 5th ed., Addison Wesley, 2007
[4]Kifer M., Bernstein A., Lewis P., Database Systems. An Application-Oriented Approach 2nd ed., Addison Wesley, 2006

SECONDARY LITERATURE:

[1] Ben-Gan I., Microsoft SQL Server 2008, T-SQL Fundamentals, Microsoft Press, 2009
[2] The educational materials prepared by the teacher course on the basis of the documentation MS SQL, Oracle, and Internet resources

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

Lech Tuzinkiewicz, lech.tuzinkiewicz@pwr.wroc.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
Databases
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	K1INF_W07	C1	Lec 2, 3, 4, 5, 6, Cl 2, 4, 5, 6	N1, N3
PEK_W02	K1INF_W07	C1	Lec 2, 5, 6, 9 Cl 3	N1, N3
PEK_W03	K1INF_W07	C1	Lec 4, 8 Cl 5, 6	N1, N3
PEK_W04	K1INF_W016	C2	Lec 7, 8, 9, 10, 11, 12, 13 Cl 4	N1, N3
PEK_W05	K1INF_W022	C1	Lec 1, 14	N1, N3
PEK_U01 (skills)	K1INF_U04	C1	Cl 2, 3 Lab 2, 3	N1, N2, N3
PEK_U02	K1INF_U09, K1INF_U19	C1, C2	Lab 3	N1, N2, N3
PEK_U03	K1INF_U09	C1	Cl 5, 6 Lab 3	N1, N2, N3
PEK_U04	K1INF_U04, K1INF_U19	C2	Lab 4, 5, 6, 7	N1, N2, N3
PEK_U05	K1INF_U14	C1	Lab 1..8	
...				
PEK_K01 (competences)				
PEK_K02				
...				

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

*** - from table above