FACULTY W-8 / DEPARTMENT……

SUBJECT CARD

Name in Polish Projektowanie bazy danych

Name in English Database Design

Main field of study (if applicable): …….

Specialization (if applicable): ……..

Level and form of studies: 1st/ ~~2nd~~* level, full-time ~~/ part-time~~*

Kind of subject: ~~obligatory~~ / optional / ~~university-wide~~*

Subject code INZ0266Wp

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)	30			120	
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	
including number of ECTS points for practical (P) classes	0			2	
including number of ECTS points for direct teacher-student contact (BK) classes	0,6			2,4	

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. General IT knowledge
2. Basic knowledge about databases, data models, DBMS

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SUBJECT OBJECTIVES

C1 Gaining the basic knowledge about database design, 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 Knows rules and tools for testing databases -> W16
PEK_W06 Knows methods of database tuning -> W16
PEK_W07 Defines the rules for defining architecture of database systems -> W22

relating to skills:

PEK_U01 Defines requirements for databases -> U03, U04
PEK_U02 Defines a conceptual data model using the UML -> U04
PEK_U03 Transforms conceptual data model into a physical model, taking into account the business rules and domain constraints -> U04
PEK_U04 Knows and is able to determine indexes for databases -> U16, U19
PEK_U05 Defines queries using DML database languages and their implementation in a DBMS for searching and processing of data in databases -> U04, U16, U19
PEK_U06 Knows and applies database security -> U09
PEK_U07 Defines project documentation -> U03

PROGRAMME CONTENT

Form of classes - lecture		**Number of hours**
Lec 1	Introduction - General Course Information – Database Life Cycle	2
Lec 2	Database Design Methodology, Model Driven Architecture (MDA)	2
Lec 3	Requirements Specification Techniques	2
Lec 4	Data modeling at different levels of abstractions	2
Lec 5	UML Modeling – Classes, Relationships, Verification and Validation	2
Lec 6	Mapping Conceptual Data Models to Relations	2
Lec 7	Implementation of conceptual data models using the SQL standard DDL	2
Lec 8	Introduction to Physical Database Design	2
Lec 9	Basic Indexing Methods	2
Lec 10	Query Optimization and Plan Selection	2
Lec 11	Designing and Maintaining Indexes	2
Lec 12	Distributing and Partitioning Data	2
Lec 13	Designing Security	2
Lec 14	Database Testing	2
Lec 15	Test	2
	Total hours	30

Form of classes - class		**Number of hours**
Cl 1		

Cl 2		
…		
	Total hours	

Form of classes - laboratory		Number of hours
Lab 1		
Lab 2		
…		
	Total hours	

Form of classes - project		Number of hours
Proj 1	Health and safety training. Conditions of the course. Topics of projects	2
Proj 2	Business analysis of problem domains (P01)	2
Proj 3	System Requirements Analysis (P02)	2
Proj 4	User stories, software requirements specification, definition of actors (P03)	2
Proj 5	Specifications of functional requirements using Use Cases, CRUD matrix (P03)	2
Proj 6	Definition of business Rules and constraints, Definition of database operations (P04)	2
Proj 7	Conceptual data model (P05)	2
Proj 8	Data model verification in the context of defined business rules and constrains (P06)	2
Proj 9	Implementation of Conceptual Data Model in MS SQL 2012 or Oracle (P07)	2
Proj 10	Definition of test cases (P08)	2
Proj 11	Generating test data (P08)	2
Proj 12	Testing SQL queries, Analysis of queries execution plans (P08)	2
Proj 13	Tuning – indexes selection, materialized views selection, partitioning (P09)	2
Proj 14	Preparing final project documentation (P10)	2
Proj 15	Presentation and evaluation of solutions	2
	Total hours	30

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_U02	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	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F4 – P04	PEK_U02	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	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	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P08	PEK_U05	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P09	PEK_U05 PEK_U06	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}
F8 – P10	PEK_U07	Evaluation of problem solution in the scale [0..1] or {2, 3.0, 3.5, 4.0, 4.5, 5.0}

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Test of students' knowledge and skills of the discussed topics on the lectures. Evaluation of the database project.

On the positive evaluation:

- The student should gain average grade from project and test at least **3.0** on the base of the following formula:

  p. < 8,0 -> 2.0
  8,0 ≤ p. < 9,5 -> 3.0
  9,5 ≤ p. < 11 -> 3.5
  11 ≤ p. < 12 -> 4.0
  12 ≤ p. < 13 -> 4.5
  13 ≤ p. ≤ 14 -> 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
[5] Lightstone S., Teorey T., Nadeau T., Physical Database Design, Elsevier 2007

SECONDARY LITERATURE:

[1] Ben-Gan I., Microsoft SQL Server 2008, T-SQL Fundamentals, Microsoft Press, 2009
[2] Hotek M., MCTS Training Kit: Microsoft SQL Server 2008 – Implementation and Maintenance, Microsoft Press, 2009
[3] 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

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AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY

……..

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 1, 2, 3, 4, 5	N1, N3
PEK_W02	K1INF_W07	C1	Lec 6	N1, N3
PEK_W03	K1INF_W07	C1	Lec 6	N1, N3
PEK_W04	K1INF_W016	C2	Lec 7, 8, 9	N1, N3
PEK_W05	K1INF_W016	C1	Lec 14	N1, N3
PEK_W06	K1INF_W016	C1	Lec 10, 11,12	N1, N3
PEK_W07	K1INF_W022	C1	Lec 12, 13	N1, N3
PEK_U01 (skills)	K1INF_U03, K1INF_U04	C1	Proj 2, 3, 4, 5, 6	N1, N2, N3
PEK_U02	K1INF_U04	C1, C2	Proj 7, 8	N1, N2, N3
PEK_U03	K1INF_U04	C1	Proj 9, 10, 11	N1, N2, N3
PEK_U04	K1INF_U16, K1INF_U19	C2	Proj 10, 12, 13	N1, N2, N3
PEK_U05	K1INF_U04, K1INF_U16, K1INF_U19	C1	Proj 9, 10, 12	N1, N2, N3
PEK_U06	K1INF_U09	C1, C2	Proj 9	N1, N2, N3
PEK_U07	K1INF_U03	C1	Proj 14	N1, N2, N3
…				
PEK_K01 (competences)				
PEK_K02				
…				

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

*** - from table above