POZNAN UNIVERSITY OF TECHNOLOGY



EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name Database Architectures [S1EiT1E>ABD]

Course				
Field of study Electronics and Telecommunication	ons	Year/Semester 3/6		
Area of study (specialization)		Profile of study general academi	с	
Level of study first-cycle		Course offered in English	1	
Form of study full-time		Requirements elective		
Number of hours				
Lecture 15	Laboratory classe 15	es	Other 0	
Tutorials 0	Projects/seminars 0	S		
Number of credit points 3,00				
Coordinators dr hab. inż. Mariusz Żal mariusz.zal@put.poznan.pl		Lecturers		

Prerequisites

The student possesses a basic knowledge of computer networks and C# programming, as well as a basic understanding of sets algebra and relation algebra. They are capable of conducting research and gathering information from various literature and reference sources. Furthermore, the student demonstrates the ability to integrate and interpret the obtained information, draw conclusions, and provide justifications. They recognize the importance of acquiring new knowledge and skills within their chosen field of study.

Course objective

The objective of this course is to equip students with knowledge of database models and architectures, SQL fundamentals, database creation, and the utilization of various database tools and developer software. Additionally, the course aims to prepare students for database optimization and programming database applications.

Course-related learning outcomes

Knowledge:

1. Possesses a systematic understanding, along with a necessary mathematical foundation, of set algebra and relation algebra.

2. Demonstrates a comprehensive knowledge, with a necessary theoretical background, of optimization methods utilized in solving engineering problems.

3. Acquires knowledge of entity relationship diagrams and database models.

4. Gains knowledge of database tuning.

Skills:

1. Proficient in utilizing English bibliographic resources (books, scientific and technical journals, application notes, catalogs, instructions, recommendations, etc.).

2. Capable of employing optimization methods to solve electronics and telecommunications problems.

3. Able to design database structures and implement them using SQL and PL/SQL.

4. Competent in utilizing optimization methods to reduce database complexity.

Social competences:

1. Recognizes the significance of communication for individual and societal development, comprehends the evolutionary progression of networks and telecommunications systems in response to users' increasing demands.

2. Acknowledges the limitations of their own knowledge and skills and recognizes the necessity for continuous education and professional development.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Student^{*}s knowledge is verified during test (either written or oral). Test in the written form contains 7- 10 questions (open questions and multi-choice questions) with different points assigned to each question. There are three or four groups of points. In oral test a student draws one question from each group. Moreover, for each drawn question an extra question (related to drawn question) may be asked. Ratting for each question (drawn question and extra question are considered together) depends on range and depth of understanding of a problem. In both, written and oral form, for the test 50-60 questions are prepared. The test is passed if the a student gets at least 50% of the total score. Verification of student skills is conducted through project that is realized during the last laboratory.

Project is divided into 5-6 tasks with different points assigned to each task. All task form a whole problem but can be realized separately. Particular tasks are ratting separately.

For a pass, student need to get at least 50% of the total score. Grading scale: number of points grade <=50 % 2,0 51% - 60% 3,0 61% - 70% 3,5 71% - 80% 4,0 81% - 90% 4,5 91% - 100% 5,0

Programme content

The program includes basic information about databases. It discusses relational databases in detail. It presents basic SQL commands and also introduces popular database tools and development software.

Course topics

Lectures:

1. Definitions: information, data, data processing. Database models. Database management systems

- 2. Relation algebra
- 3. SQL basis
- 4. Database creation process
- 5. Database optimization, normal forms, anomalies
- 6. Database applications
- 7. Database tools and developer software

Laboratory classes:

- 1. Database definitions
- 2. Simple SQL queries
- 3. Database modifications
- 4. Advanced SQL queries
- 5. PL SQL procedures
- 6. Database applications

Teaching methods

Lectures:

a) multimedia presentation with additonal examples presented and expalined on a board

b) case study based on the presentation with usage of SQL tools

Laboratory classes:

a) practical programming exercies with computers and SQL tools,

b) short multimedia presentations

Bibliography

Basic:

1. Li Yan, Zongmin Ma, Advanced database query systems : techniques, applications and technologies, Hershey : Information Science Reference, 2011.

2. Oracle, Database SQL Language Reference, online: https://docs.oracle.com/database/121/SQLRF/ toc.htm,

Additional:

- 1. Jason Price, Oracle Database 11gSQL, McGrawHill 2008
- 2. PL/SQL Users Guide and Reference, Release 2 (9.2) Part No. A96624-01
- 3. Joe Celko, The Guru"s Guide to Transact-SQL, Addison-Wesley Professional; 1st edition (March 4, 2000)

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	31	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	44	1,00