GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Databases programming, PG_00064059		
Field of study	Technical Physics		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Solid State Physics -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Bartosz Reichel	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	45.0	0.0	0.0	60

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	60	5.0	60.0	125

Subject objectives

Presentation of practical applications of data bases in all possible life domains, teaching of SQL language, teaching of integrity of basis set and of application's interface, teaching of programming by means of the interfaces in vseveral languages, teaching of rules of creation and usage of: transactions, stored procedures and functions, triggers, views, informations schemes.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U02] analyzes and solves simple scientific and technical problems, based on possessed knowledge, using analytical, numerical, simulation and experimental methods	Can build SQL queries.	[SU2] Assessment of ability to analyse information
[K6_U03] knows programming languages and can use basic software packages	Can implement selected issues	[SU1] Assessment of task fulfilment
[K6_W05] has knowledge of programming methodology and techniques, and the use of selected IT tools in physics and technology	Can use databases in physics.	[SW1] Assessment of factual knowledge
[K6_K01] understands the need to learn and improve professional and personal competencies, inspires and organizes other people’s learning process	Can read and understand documentation.	[SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>Course content – lecture
Lectures: Basics: 1. Examples from our life.. Basic terminology: models of data bases, (hierarchical, network, relational, object), design of databases, normalization. Examples of realization of relational databases: MySQL, PostgreSQL, Oracle, Sybase, Interbase. 2. Servers and clients of databases. Logging, basic commands of the clients of databases, ODBC, cooperation with databases through interfaces of popular programming languages:: Perl, PHP, Java. SQL language: 1. syntax, comments, basic commands: SELECT, INSERT, UPDATE, DELETE, data types, numerical, character, logical, BLOB, NULL) 2. Strings, logical values, date and time types, optimal data types, import, mapping and transformation between data types from other database systems. 3. Functions and operators: logical operators, comparison of numbers, strings, signs, NULL type. 4. Commands: SELECT, INSERT. subqueries, 5. Commands: DELETE, UPDATE, REPLACE, TRUNCATE. Relations (tables): 1. Relations between tables: definition of and working with keys, tables types, commands: CREATE, DROP, ALTER, RENAME, DESCRIBE and others. Transactions: 1. Izolation levels, various examples, consistent SELECT, SELECTs for UPDATEs. 2. Blocking of access to tables. Stored procedures, functions and triggers, 1. Parameters, control instructions (if-the-else), loops, cursors, error handling, new SQL statements 2. Stored functions. 3. Triggers, definitions, examples, Views: 1. Definitions, working with views, rules 2. Information schemes. Administration: 1. Elements of safety related to working databases, 2. Administration of user accounts, privileges, restraints, 3. Database server and its working at the operating system. 4. Data backups,
Course content – laboratory
Laboratories: -project of a database in client-server technology (or other) with interface written in any known and compatible programming language. The project should contain advanced solutions commonly used in the current databases solutions, like transactions and/or trigers and others.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>1. Basic requirements: a) ability to work with computers operated by Linux/Unix systems b) ability to program in any language, cooperating with databases
2. Additional requirements a) Ability to program in any script language, b) Ability to administrate of Linux/ Unix operating systems.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>Exam</td><td>51.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>1. notatki z wykładu(http://153.19.42.86/~mate/wyklady/bazy_danych/)

2. "MySQL. Leksykon kieszonkowy", George Reese, Helion, O"REILLY, 2003

3. "PHP i MySQL. Aplikacje bazodanowe" Hugh E. Williams, David Lane, Helion, O"REILLY, 2004

4."PostgreSQL. Praktyczny przewodnik" John C. Worsley, Joshua D. Drake, Helion, O"REILLY, 2002

5. "SQL. Almanach. Opis poleceń języka" Kevin Kline, Daniel Kline, Helion, O"REILLY, 2004</td></tr>
<tr><td>Supplementary literature</td><td>Scripting programming literature.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. write a data base project along with an interface written in one of the programming languages,
2. write an examination test
3. write a SQL command, by means of which one gets the data on winners of competition on folding of proteins by means of numerical methods, while for each candidate one must get his personal information as well as information on his research unit.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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