



Subject card

Subject name and code	Databases programming, PG_00064059						
Field of study	Technical Physics						
Date of commencement of studies	October 2026	Academic year of realisation of subject				2028/2029	
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] is able to analyse and solve complex and non-standard scientific and technical problems using appropriate analytical, computational, numerical, simulation or experimental methods.	Can build SQL queries. Can use documentation and standards describing databases (relational algebra, graphs).			[SU2] Assessment of ability to analyse information		
	[K6_U03] possesses programming skills in a selected language and the ability to use selected software packages.	Can implement selected topics using available packages and has the ability to install them correctly.			[SU1] Assessment of task fulfilment		
	[K6_W05] has knowledge of programming methodologies and techniques, as well as the use of selected IT tools in physics and engineering.	Knows how to use databases in physics/science. Understands the limitations imposed by selected database models.			[SW1] Assessment of factual knowledge		
	[K6_K03] demonstrates readiness to perform professional roles responsibly, adhere to ethical principles and ensure occupational safety.	Student is always ready to seek out current information on databases and development trends. Guided by ethical principles in designing database (data) systems and ensures data security.			[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	<p>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.</p> <p>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.</p>											
Prerequisites and co-requisites	<ol style="list-style-type: none"> 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. 											
Assessment methods and criteria	<table border="1" data-bbox="448 710 1487 810"> <thead> <tr> <th data-bbox="448 710 794 741">Subject passing criteria</th> <th data-bbox="794 710 1141 741">Passing threshold</th> <th data-bbox="1141 710 1487 741">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 741 794 772">Project</td> <td data-bbox="794 741 1141 772">51.0%</td> <td data-bbox="1141 741 1487 772">50.0%</td> </tr> <tr> <td data-bbox="448 772 794 810">Exam</td> <td data-bbox="794 772 1141 810">51.0%</td> <td data-bbox="1141 772 1487 810">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	51.0%	50.0%	Exam	51.0%	50.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<ol style="list-style-type: none"> 1. notatki z wykladu(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 <p>Scripting programming literature.</p>										
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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. 											
Practical activites within the subject	Not applicable											

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