



Subject card

Subject name and code	Databases programming, PG_00064059						
Field of study	Technical Physics						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2027/2028	
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_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_U03] knows programming languages and can use basic software packages		Can implement selected issues			[SU1] Assessment of task fulfilment	
	[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_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	

Subject contents	<p>Course content – lecture</p> <p>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</p> <p>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 triggers and others.</p>		
Prerequisites and co-requisites	<p>1. Basic requirements: a) ability to work with computers operated by Linux/Unix systems b) ability to program in any language, cooperating with databases</p> <p>2. Additional requirements a) Ability to program in any script language, b) Ability to administrate of Linux/ Unix operating systems.</p>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	51.0%	50.0%
	Exam	51.0%	50.0%
Recommended reading	Basic literature	<p>1. notatki z wykładu(http://153.19.42.86/~mate/wyklady/bazy_danych/)</p> <p>2. "MySQL. Leksykon kieszonkowy", George Reese, Helion, O'REILLY, 2003</p> <p>3. "PHP i MySQL. Aplikacje bazodanowe" Hugh E. Williams, David Lane, Helion, O'REILLY, 2004</p> <p>4."PostgreSQL. Praktyczny przewodnik" John C. Worsley, Joshua D. Drake, Helion, O'REILLY, 2002</p> <p>5. "SQL. Almanach. Opis poleceń języka" Kevin Kline, Daniel Kline, Helion, O'REILLY, 2004</p>	
	Supplementary literature	Scripting programming literature.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>1. write a data base project along with an interface written in one of the programming languages,</p> <p>2. write an examination test</p> <p>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.</p>		
Practical activites within the subject	Not applicable		

Document generated electronically. Does not require a seal or signature.