



## Subject card

Subject name and code	Databases programming, PG_00020784						
Field of study	Technical Physics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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	Zakład Fizyki Teoretycznej i Informatyki Kwantowej -> Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bartosz Reichel				
	Teachers		dr inż. Bartosz Reichel				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	45.0	0.0	0.0	75
	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	75		10.0		40.0	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		Formulates SQL queries		[SW1] Assessment of factual knowledge		
	K6_U02		Formulates SQL queries		[SU2] Assessment of ability to analyse information		
	K6_U03		Programing in PHP, Java, Python with the use of databases		[SU1] Assessment of task fulfilment		
	K6_K01		Is aware of his strengths and weaknesses		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	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, 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.						

Prerequisites and co-requisites	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	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	51.0%	50.0%
	Project	51.0%	50.0%
Recommended reading	Basic literature	1. notatki z wykładu( <a href="http://153.19.42.86/~mate/wyklady/bazy_danych/">http://153.19.42.86/~mate/wyklady/bazy_danych/</a> )  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	
	Supplementary literature	Scripting programming literature.	
	eResources addresses	Adresy na platformie eNauczanie: Programowanie baz danych 2023 - Moodle ID: 33749 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33749">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33749</a>	
Example issues/ example questions/ tasks being completed	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.		
Work placement	Not applicable		