



## Subject card

Subject name and code	Databases, PG_00053919						
Field of study	Automatic Control, Cybernetics and Robotics						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023		
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		3.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Adam Bujnowski				
	Teachers		dr inż. Adam Bujnowski				
			dr inż. Magdalena Mazur-Milecka				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45
	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	45		4.0		26.0	75
Subject objectives	Main goal of the subject is to familiarize students with basic databases techniques. During course student meets basic database terms - such as data, database , DBMS, data model etc. Student gets knowledge about various data models and learns how to design data structure - especially within relational database. Additionally student learns how to use selected DBMS and learns the SQL language. Student learns how to use transactions, SQL functions, triggers and learns how to use SQL within another programming language to create data interface.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study		Student uses SQL language to manage relational database Student uses SQL language inside other language Student analyses data using SQL language		[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K6_W04] Knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices		Student knows basic database terms Student knows and identifies data models Student designs realtional databases		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		

Subject contents	Principal terms - data, information, knowledge, database, DBMS, data model. Layered model of database system, Datamodel vs data structure, Flat databases, Relatron between entites, hierarchical model, network data model, XML as a hierarchical database, Relational data model - structure of the data, Data integrity in relational databases, Graphical notations of the RDB structure, Normalisation, Designing of the relational databases, SQL - genesis, usage of the SQL, classification. Data definition language, Data types in SQL, Data manipulation language, tuple selection statements, SELECT - data retrieval, SQL - privileges , user and database management, Aggregate functions, User defined functions, triggers, transactions, additional SQL forms - comments , Backup copies of the data, Data access methods - using procedural languages. Object data model.		
Prerequisites and co-requisites	Basic skills in computing.  Programming in C/C++  HTML basics including php and JavaScript		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory achievements	50.0%	60.0%
	exam	50.0%	40.0%
Recommended reading	Basic literature	Davies, Database systems  Matthews Stones, Databases and PostgreSQL  Rumiński, Bujnowski, Skrypt do przedmiotu Bazy Danych	
	Supplementary literature	<a href="#">Rogulski</a> , Bazy danych dla studentów. Podstawy projektowania i języka SQL, Witkom, 2012	
	eResources addresses	Adresy na platformie eNauczanie:	
	Example issues/ example questions/ tasks being completed		
Work placement	Not applicable		