

Subject card

Subject name and code	Databases, PG_00197994						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2026/2027		
Education level	Bachelor's studies	Subject group			Obligatory subject group in the field of study 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			5.0		
Learning profile	academic	Assessment form			exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Andrzej Borzyszkowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	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	0.0	65.0	125		
Subject objectives	Learning a relational database system. In the practical part, the student will prepare his own database project, as well as master the SQL language, which is a standard in database systems. In the theoretical part, the student will learn about the foundations of database design, the concept of transactions, the principles of integration in a programming environment, the principles of security and confidentiality present in database systems.						
Learning outcomes	Course outcome	Subject outcome		Method of verification			
	[INFOL3_U06] can select and apply appropriate methods and IT tools to solve complex problems						
	[INFOL3_U02] is able to use his/her knowledge of higher mathematics to model and solve complex problems						
	[INFOL3_W06] knows and understands advanced models of database systems, with particular emphasis on the relational model	has knowledge of database design based on the relational database model has knowledge of the use of various tools to work with the databases		[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report			

Subject contents	<ul style="list-style-type: none"> • Main concepts: data, database, database management system, properties of database systems. • Data modeling: entity relationship model, entity relationship diagrams, binary relationship classification, normalization. • Relational model: tables, relations vs. tables, relationship schemas, keys and other integrity constraints. Mapping the entity and relationship diagram into a relational model. Relational algebra: choice, projection, joins, set theoretic operations, aggregate functions. Calculus of tuples. Calculus of domains. • SQL: defining data, operating on data, performing relational algebra operations, nested queries, NULL values, perspectives. • Server-side programming, triggers. Client-side programming, access to a database via the Internet. • Concurrency management: transactions, isolation levels, locks and other tools. • Safety in databases. • Complexity of operations in databases, indexes, query optimizer. 		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	40.0%
	project	51.0%	20.0%
	exam	51.0%	40.0%
Recommended reading	Basic literature	Andrzej Borzyszkowski, course materials available on a webpage	
	Supplementary literature	<ol style="list-style-type: none"> 1. Richard Stones, Neil Matthew: Bazy danych i PostgreSQL. ISBN: 83-7197-650-X, Helion 2002. 2. Eric Johnson, Joshua Jones Modelowanie danych w SQL Server 2005 i 2008. Przewodnik. Helion 2009. 3. R. Elmasri, S. Navathe, Fundamentals of Database Systems, Pearson 2007. 4. Judith S. Bowman, Sandra L. Emerson, Marcy Darnovsky: Podręcznik języka SQL. ISBN: 83-204-2596-4, Wydawnictwa Naukowo-Techniczne 2001. 5. C. J. Date, Wprowadzenie do systemów baz danych, WNT Warszawa, 2000. 6. J. D. Ulman. Systemy baz danych. WNT, Warszawa, 1988. 	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<p>What problems appear caused by a deletion in the presence of a foreign key? What are the solutions?</p> <p>Give a few examples of the use of triggers.</p> <p>What problems may cause a concurrent access to a database ?</p>		
Work placement	Not applicable		

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