University of Gdańsk

Subject card

Subject name and code	Databases, PG_00189936		
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 practical vocational preparation
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	practical	Assessment form	exam
Conducting unit	Institute of Informatics -> Faculty of Mathematics, Physics and Informatics -> Rector		
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 their 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
[INFPL3_U03] is able to cooperate with other people within teamwork, including being able to manage his/her time, make commitments, communicate using various techniques in the professional environment, including the use of dedicated tools; is able to present different opinions and alternative technical solutions in the project team, explaining their basis, consequences and impact on the project implementation	The student is able to cooperate in a project team, manage their own time and commitments, and communicate using tools supporting teamwork, as well as present and justify alternative database design solutions.	[SU2] presentation/project/paper/ report
[INFPL3_U07] is able to use his knowledge to select the type of database depending on needs, create an adequate model and use it	is able to choose the type of database depending on the needs and create and use an adequate model	[SU2] presentation/project/paper/ report
[INFPL3_W05] knows and understands advanced concepts related to the design and use of databases; applies this knowledge when designing and implementing relational and non-relational databases, query optimization and system integration	knows how to design a database in a relational model is able to use various tools in working with a database	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[INFPL3_K03] is ready to make decisions independently, critically evaluate their own actions and the actions of the teams they are part of directs, and the organizations in which it participates, accepting responsibility for the consequences of these actions	is ready to work in a team of IT professionals, make commitments and meet deadlines, communicate using various techniques in a professional environment, including the use of dedicated tools	[SK2] presentation/project/paper/ report [SK8] observation of student's independent or team work
[INFPL3_K02] is ready to recognize the importance of knowledge in solving cognitive problems and practical and seeking opinions experts in case of difficulties with independent problem solving	is able to precisely formulate questions to deepen his own understanding of a given topic or to find a missing element of reasoning	[SK2] presentation/project/paper/ report
[INFPL3_K01] is ready to critically assess the scope and quality of knowledge acquired and the content received, recognizing their limitations and the degree of credibility; demonstrates readiness to update one's own knowledge and confront it with various sources	knows the limitations of his own knowledge and understands the need for further learning	[SK8] observation of student's independent or team work

Subject contents

- 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 issues in databases.
- Performance in databases, indexes, query optimizer.

Student will become familiar with terminology in English.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
test	51.0%	40.0%
exam	51.0%	40.0%
project	51.0%	20.0%

Recommended reading

Basic literature	None

	Supplementary literature	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	What is the problem of deletion in the presence of a foreign key? What are the solutions? Give a few examples of the use of triggers. What problems can appear becaause of concurrent access to a database ?	
Work placement	Not applicable	

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