Subject card

Subject name and code	Databases, PG_00064005
Field of study	Data Engineering

Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	first-cycle 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	2	Language of instruction	English
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam

Conducting unit	Department of Software Engineering -> Faculty of Electronics, Telecommunications and Informatics

Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Krzysztof Goczyła
	Teachers	prof. dr hab. inż. Krzysztof Goczyła

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	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	8.0	47.0	100

Subject objectives	The aim of the course is introduction the student to functions of a database management system, to the rules of relational database desing and to construction of SQL statements.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U07] uses information technologies to improve the acquisition, analysis and processing of data in business applications	The student is able to complete a task involving the creation of a relational database and the formulation of queries of varying degrees of complexity.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
	[K6_U04] formulates logical solutions to complex or unstructured problems	The student is able to analyze a real complex system, define constraints and assumptions in the context of creating a database.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools
	[K6_W06] classifies the acquired information, assessing its usefulness in solving the formulated problems	The student is able to gather information, classify it appropriately and create a system model in accordance with the ERM methodology.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents	1. Architecture of database systems
	2. The functions of database management system
	3. Entity sets, attributes of entities, keys of entities, relationships
	4. Entity Relationship Diagram (ERD) basics concepts
	5. Creating entity relationship diagrams
	6. Relational database - definitions, integrity constraints
	7. From an entity relationship diagram to a relational database schema
	8. Fundamentals of relational algebra
	9. Review of SQL language, SQL standards
	10. Creating tables and inserting data
	11. Simple queries with expressions
	12. Queries using aggregate functions and grouping
	13. Queries with joins
	14. Nested queries
	15. Queries for update, delete and mass insert
	16. Views, operations on views
	17. Normalization of relational databases
	18. Identification, authentication and authorization of users

Prerequisites and co-requisites	No requirements

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lab	50.0%	25.0%
	project	50.0%	25.0%
	exam	50.0%	50.0%

Recommended reading	Basic literature	P. Beynon-Davies. "Database Systems". WNT 2000.
		C.J.Date. "Introduction to database systems". Wiley, 2000.
		M.Gruber. "SQL", 2nd Edition. Helion 2000
		K.Goczyła. "Databases". Lecture materials. Gdańsk.
	Supplementary literature	None

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Construct an entity relationship model for an example real-life case 2. Construct and create a relational database 3. Formulate a query to a relational database 4. Specify the operators of relational algebra 5. Give reasons for violation of the second and third normal form 6. Normalize a sample database	
Work placement	Not applicable	

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