



Subject card

Subject name and code	Databases, PG_00058851						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
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	Part-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	4	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Zbigniew Łubniewski					
	Teachers	dr hab. inż. Zbigniew Łubniewski dr inż. Marek Kulawiak mgr inż. Tomasz Idzi					
Lesson types	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	6.0		74.0		125
Subject objectives	To familiarize students with creating and management of relational databases .						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_U07] can apply methods of process and function support, specific to the field of study	Student is able to adequately design a secure database system, depending on the specific needs of the user.			[SU2] Assessment of ability to analyse information		
	[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	Student knows the principles of construction and operation of computer systems.			[SW1] Assessment of factual knowledge		

Subject contents

Course content – lecture

1. Database system architecture
2. Functions of a Database Management System (DBMS)
3. Entity sets, entity attributes, entity keys, relationships
4. Entity relationship diagrams (ERDs) - general concepts
5. Creating entity relationships diagrams
6. Relational database - definitions
7. Integrity rules: entity integrity, referential integrity
8. From an entity relationship diagram to a relational database schema
9. Relational algebra: set-theoretic operators
10. Relational algebra: relational operators
11. SQL - an overview, origins, standards
12. Creating tables
13. Populating tables with data
14. Simple queries
15. SQL expressions - simple and conditional
16. Queries with aggregate functions
17. Queries with grouping
18. Queries with joins
19. Queries with outer joins
20. Nested queries
21. Queries for UPDATEs, deletes and bulk inserts
22. Views, operations on views, updatable views
23. Cursors, sequential processing of query results
24. Normalization of relational databases: 2nd and 3rd normal form
25. Boyce-Codd normal form
26. Normalization of relational databases: 4th and 5th normal form

	<p>27. Transactional processing in databases - basics</p> <p>28. Isolation levels in transactions</p> <p>29. Transactional processing and SQL standards</p> <p>30. Rules for development of correct database applications in concurrent environments</p> <p>31. Identification, authentication and authorization in databases</p> <p>32. Authorization of SQL operations on data: views, GRANT and REVOKE statements</p>			
Prerequisites and co-requisites	No requirements			
Assessment methods and criteria		Subject passing criteria	Passing threshold	Percentage of the final grade
		Presence	0.0%	10.0%
		Written test	50.0%	50.0%
		Practical exercise	50.0%	40.0%
Recommended reading	Basic literature	<p>P. Beynon-Davies. "Systemy baz danych". WNT 2000.</p> <p>C. J. Date. "Wprowadzenie do systemów baz danych". WNT 2000.</p> <p>M. Gruber. "SQL", wydanie drugie. Helion 2000</p>		
	Supplementary literature	K. Goczyła, A. Landowska, M. Piechówka. "Bazy danych". Materiały do wykładu. Gdańsk, 2009		
	eResources addresses			
Example issues/ example questions/ tasks being completed	<p>Creating a relational database schema based on the entity relationship diagram.</p> <p>Verification normal form of the database.</p> <p>Developing SQL commands for creating and modifying objects in a relational database.</p> <p>Developing SQL commands to obtain data from a relational database.</p>			
Practical activities within the subject	Not applicable			

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