



Subject card

Subject name and code	Databases, PG_00047832						
Field of study	Informatics						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2022/2023		
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		6.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Geoinformatics -> Faculty of Electronics, Telecommunications and Informatics						
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 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		6.0		99.0	150
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_W43] Knows and understands, to an advanced extent, standards and methods of IT systems administration, monitoring of processes occurring in them and immunising them to undesirable phenomena and activities	Student knows the principles of designing, creating and managing a database.	[SW1] Assessment of factual knowledge
	[K6_W41] Knows and understands, to an advanced extent, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining	Student knows the methods of administering and managing the database.	[SW1] Assessment of factual knowledge
	[K6_U42] can apply tools and methods of designing, optimization, monitoring, management, increasing reliability and protection from safety hazards in local and distributed information systems and applications	Student is able to design and implement data security mechanisms, including user authorization and authentication.	[SU4] Assessment of ability to use methods and tools
	[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

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

	27. Transactional processing in databases - basics		
	28. Isolation levels in transactions		
	29. Transactional processing and SQL standards		
	30. Rules for development of correct database applications in concurrent environments		
	31. Identification, authenticatrion and authorization in databases		
	32. Authorization of SQL operations on data: views, GRANT and REVOKE statements		
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. Beynon-Davies. "Systemy baz danych". WNT 2000.	
		C. J. Date. "Wprowadzenie do systemów baz danych". WNT 2000.	
		M. Gruber. "SQL", wydanie drugie. Helion 2000	
	Supplementary literature	K. Goczyła, A. Landowska, M. Piechówka. "Bazy danych". Materiały do wykładu. Gdańsk, 2009	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Creating a relational database schema based on the entity relationship diagram.		
	Verification normal form of the database.		
	Developing SQL commands for creating and modifying objects in a relational database.		
	Developing SQL commands to obtain data from a relational database.		
Work placement	Not applicable		