

GDAŃSK UNIVERSITY

Subject card

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Subject name and code	Databases, PG_00047832							
Field of study	Informatics							
Date of commencement of studies	October 2020		Academic year of realisation of subject		2021/2022			
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	Subject supervisor		dr hab. inż. Zbigniew Łubniewski					
of lecturer (lecturers)	Teachers		dr hab. inż. Zbigniew Łubniewski					
			dr inż. Marek Kulawiak					
			marinż Tomasz Idzi					
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	30.0	0.0	15.0	0.0		0.0	45
	E-learning hours included: 0.0							
	Adresy na platformie eNauczanie:							
Learning activity and number of study hours	Learning activity Participation in classes include plan		n didactic led in study	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_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 pronciples of construction and operation of computer systems.	[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_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 administrating and managing the database.	[SW1] Assessment of factual knowledge	
	[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_U07] can apply methods of process and function support, specific to the field of study	Student is able to adequatly design a secure database system, depending on the specific needs of the user.	[SU2] Assessment of ability to analyse information	

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. Ralational database - definitions				
	7. Integrity rules: enitity 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	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria	Practical exercise	50.0%	40.0%			
	Written test	50.0%	50.0%			
	Presence	0.0%	10.0%			
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					
Example issues/ example questions/ tasks being completed	cample issues/ Creating a relational database schema based on the entity relationship diagram. cample questions/ sks being completed					
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					