

Subject card

Subject name and code	Database, PG_00156749						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's 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		Polish		
Semester of study	4		ECTS credits		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit	Department of Business Informatics -> Faculty of Management -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Jacek Maślankowski				
	Teachers		mgr inż. Przemysław Bykowski				
			dr Jacek Maślankowski				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	45.0	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		20.0		70.0	150
Subject objectives	familiarizing students with a comprehensive approach to database design,preparing students to use a database management system,preparing students to write database scripts in SQL.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[liEL3_U04] The student can plan, design and program information systems to support the functioning of economic entities.	Writes advanced database scripts in T-SQL. Optimizes database queries using dynamic SQL. Writes SQL programs in the form of procedures and functions based on previously prepared requirements.	[SU5] implementation of a problem task
	[liEL3_K03] The student can work in, co-create and manage a team; adapts his/her behavior and conduct to his/her role in it; is ready to take responsibility for the team and bear the consequences; understands the necessity of regularity and consistency in action; is open to other team members and critical of himself.	Is knowledgeable about database security issues. Demonstrates creativity in selecting database technologies for specific applications in business and administrative organizations.	[SK2] presentation/project/paper/report
	[liEL3_U02] The student is able to acquire basic information about economic processes and phenomena by direct observation, planned experiment or database queries, and collect and process it using modern information technology tools.	Writes advanced database scripts in T-SQL. Optimizes database queries using dynamic SQL. Writes SQL programs in the form of procedures and functions based on previously prepared requirements.	[SU5] implementation of a problem task
	[liEL3_W04] The student has advanced knowledge of mathematical, statistical, econometric and computer methods of obtaining, processing and analysing data depicting the functioning and development of the national economy and its elements, as well as the phenomena and processes occurring in their environment.	Is able to assess the possibility of optimizing existing databases. Has knowledge of existing database technologies and is able to adapt them to specific user needs. Is able to define a security policy for databases.	[SW4] test/exam - oral or written
	[liEL3_W05] The student has advanced knowledge of the sources of socio-economic data, their databases and ways of creating them.	Is able to assess the possibility of optimizing existing databases. Has knowledge of existing database technologies and is able to adapt them to specific user needs. Is able to define a security policy for databases.	[SW4] test/exam - oral or written
	[liEL3_U08] The student can configure and apply advanced modern information and communication technologies in the process of business management and business communication.	Writes advanced database scripts in T-SQL. Optimizes database queries using dynamic SQL. Writes SQL programs in the form of procedures and functions based on previously prepared requirements.	[SU5] implementation of a problem task
Subject contents	Introduction to databases: types of databases. The concept of creating tables, primary keys, foreign keys, one-one, one-many and many-many relationships, joining tables. Mandatory and optional relationships. Designing tables based on received data attributes. Introduction to ERD: types of diagrams and their components. Introduction to SQL, create, update, select and delete statements. Data normalization. Differences between 0NF, 1NF, 2NF and 3NF. Transition to third normal form. Normalizing data based on received company case descriptions. The concept of normalization to 4NF and 5NF. Database tools - importing and exporting data based on various file formats. Basics of SQL: CREATE, INSERT, SELECT statements and sequences. Creating tables. Inserting data into tables. Primary keys and foreign keys. Using the CONSTRAINT expression to define restrictions on entered data. SELECT statement syntax - displaying data from tables. SELECT statement - conditions, expressions and operators. Comparison, arithmetic and string concatenation operators. WHERE condition. Table and column synonyms. SELECT statement with BETWEEN and CASE WHEN conditional expressions. SOME, ANY and IN statements. SELECT statement - aggregate functions. GROUP BY statement with HAVING expressions. SELECT statement - creating advanced reports using grouping statements. Sorting data using ORDER BY statements. Creating views - CREATE VIEW statement. ALTER statement, users and groups, object permissions. Database backups and recovery. Database procedures, functions and triggers. Database modelling based on received company case descriptions - case studies.		
Prerequisites and co-requisites	Knowledge of how databases or spreadsheets work; knowledge of data-based reporting.		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	colloquium - exercises	51.0%	25.0%
	project - database	51.0%	30.0%
	student's activity during classes	51.0%	10.0%
	exam - test	51.0%	35.0%
Recommended reading	Basic literature	1. Wrycza S., Maślankowski J. (red.) Informatyka ekonomiczna. Teoria i zastosowania., PWN, 2019 (rozdział Bazy danych. Big Data.) 2. Balter A., T-SQL dla każdego, Helion, 2016 3. Documentation Transact-SQL Reference (Transact-SQL), http://msdn.microsoft.com 4. Materials on PE UG: http://pe.ug.edu.pl . 5. Documentation MS SQL Server: https://learn.microsoft.com/en-us/sql/sql-server/?view=sql-server-ver16	
	Supplementary literature	1. Ward B., Odslaniamy SQL Server 2019, APN Promise, 2020 2. Molinaro A., Graaf R., SQL. Zapytania i techniki dla bazodanowców, Helion, 2021 3. Mistry S., Microsoft SQL Server 2012. Management and Administration, Pearson, 2013 4. Brust A., Lobel L.G., Programming Microsoft SQL Server 2012 (Developer Reference), O'Reilly, 2012 5. Brust A., Lobel L., Microsoft SQL Server 2012. Podstawy języka T-SQL, Wydawnictwo Helion, Gliwice, 2010	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Exam test form in the form of open and multiple choice questions. Assessment of the ability to create entity relationship diagrams and data normalization, knowledge of theoretical issues of creating and using databases. Colloquium independent solution of a problem posed by the instructor (SQL queries), assessment of the ability to create scripts that create, feed, modify and explore data and aspects of database management. Database project in accordance with the requirements set by the instructor, including database diagrams, data normalization, database scripts. Student activity during classes points earned for correctly solving the problem issues posed.		
Work placement	Not applicable		

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