

Subject card

Subject name and code	Databases, PG_00178050						
Field of study	Informatics and Econometrics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
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						
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	4.0	86.0	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		
	[[iIEL3_U12] The student can design and implement IT systems to enhance business operations and effectively utilize modern ICT technologies for 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		
	[[iIEL3_U03] Students can obtain data from appropriately selected sources, use these data to solve economic and social problems, and process and interpret them using econometrics, informatics or statistics tools.		Has skills about database security issues. Demonstrates creativity in selecting database technologies for specific applications in business and administrative organizations.		[SU2] presentation/project/paper/report		
	[[iIEL3_W05] To an advanced degree, the student knows and understands the methods, techniques and informatics or statistics tools used to acquire, collect, process and present data in decision-making processes.		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		

Subject contents	<p>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.</p>																	
Prerequisites and co-requisites	Knowledge of how databases or spreadsheets work; knowledge of data-based reporting.																	
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="448 759 794 792">Subject passing criteria</th> <th data-bbox="794 759 1141 792">Passing threshold</th> <th data-bbox="1141 759 1487 792">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 792 794 826">student's activity during classes</td> <td data-bbox="794 792 1141 826">51.0%</td> <td data-bbox="1141 792 1487 826">10.0%</td> </tr> <tr> <td data-bbox="448 826 794 860">project - database</td> <td data-bbox="794 826 1141 860">51.0%</td> <td data-bbox="1141 826 1487 860">30.0%</td> </tr> <tr> <td data-bbox="448 860 794 893">colloquium - exercises</td> <td data-bbox="794 860 1141 893">51.0%</td> <td data-bbox="1141 860 1487 893">25.0%</td> </tr> <tr> <td data-bbox="448 893 794 931">exam - test</td> <td data-bbox="794 893 1141 931">51.0%</td> <td data-bbox="1141 893 1487 931">35.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	student's activity during classes	51.0%	10.0%	project - database	51.0%	30.0%	colloquium - exercises	51.0%	25.0%	exam - test	51.0%	35.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Ward B., Odślaniamy 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																	

<p>Example issues/ example questions/ tasks being completed</p>	<p>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.</p>
<p>Work placement</p>	<p>Not applicable</p>

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