University of Gdańsk

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_W05] Knows and understands the methods, techniques and informatics or statistics tools used to acquire, collect, process and present data in decision-making processes	Knows and understands the operational principles of existing database technologies, data models, and IT tools used for database construction and management.	[SW4] test/exam - oral or written
[IiEL3_U12] Can design and implement IT systems to enhance business operations and effectively utilize modern ICT technologies for management and business communication	Is able to write advanced database scripts in T-SQL. Is able to optimize database queries using dynamic SQL. Is able to write SQL programs in the form of stored procedures and functions based on pre-defined requirements.	[SU5] implementation of a problem task
[IiEL3_U03] 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	Is able to ensure data security in databases and demonstrates creativity in selecting appropriate database technologies for applications implemented in business and administrative organizations.	[SU2] presentation/project/paper/ report

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
exam - test	51.0%	35.0%
colloquium - exercises	51.0%	25.0%
student's activity during classes	51.0%	10.0%
project - database	51.0%	30.0%

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., Odsłaniamy 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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