GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	DATA ANALYSIS WITH SQL, PG_00070983		
Field of study	Economic Analytics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	second-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	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Informatics In Management -> Faculty of Management and Economics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Anna Trzaskowska	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	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	3.0	27.0	75

Subject objectives

The course aims to develop data analysis skills using SQL in the context of business problems. Students will learn advanced techniques for querying, processing, and aggregating data, and their use in economic analysis and decision-making. Particular emphasis is placed on the practical application of SQL in data analysis, data quality assessment, and the interpretation and presentation of analysis results.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_U04] is able to prepare and convincingly present the results of specialized analyses, providing in-depth interpretation during debates and meetings with various audiences.	can formulate advanced SQL queries to analyse data, develop analysis results, interpret them and present them in a way adapted to various recipients, supporting decision-making processes in the organisation	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task [SU1] Assessment of task fulfilment
[K7_K01] is ready to critically evaluate his/her knowledge in economic analytics and seek expert opinions when facing difficulties in solving a problem independently.	is ready to critically evaluate his/her own analyses and knowledge, understands the limitations of the methods used and can use expert knowledge to solve complex analytical problems	[SK2] Assessment of progress of work [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
[K7_W04] has an in-depth understanding of analytical methods, reliable data sources, and copyright principles in the context of solving contemporary socio-economic problems.	has in-depth knowledge of data analysis methods using SQL, knows the principles of acquiring and assessing the reliability of data sources and understands the importance of data quality in the analysis of socio-economic problems	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – lecture

1. The Role of SQL in Data Analysis and Business Intelligence Systems
2. Data Sources in an Organization and Assessing Their Quality and Reliability
3. Advanced SQL Queries (JOINs and Subqueries)
4. Data Aggregation and Grouping in Business Analysis
5. Analytical Functions (Window Functions) in Data Analysis
6. Economic Data Analysis Using SQL
7. Presenting Analysis Results and Communicating with Stakeholders
8. Data Analysis Limitations and Interpretation Errors

Course content – laboratory

1. Working with the database SELECT queries and data filtering
2. Joining tables and integrating data from various sources
3. Subqueries and complex SQL queries
4. Aggregating and grouping data
5. Analytical functions (ROW_NUMBER, RANK, SUM OVER)
6. Economic data analysis (e.g., sales, customers, costs)
7. Preparing data for reports and dashboards (e.g., Power BI)
8. Analytical project in SQL developing and presenting results

Prerequisites and co-requisites

knowledge of the basics of SQL

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
SQL Practice Test	60.0%	25.0%
Laboratory tasks	60.0%	25.0%
Analytical project (SQL + interpretation and presentation of results)	60.0%	50.0%

Recommended reading

Basic literature	1. Beaulieu, A. (2020). Learning SQL (3rd ed.). OReilly Media. 2. Molinaro, A. (2020). SQL Cookbook (2nd ed.). OReilly Media.
Supplementary literature	1. Aspin, A. (2024). Querying Databricks with Spark SQL. BPB Publications 2. own materials for classes
eResources addresses	

Example issues/ example questions/ tasks being completed

Questions:
- How does SQL support data analysis in organizations?
- How can data from multiple sources be integrated into SQL?
- How can analytical functions be used in data analysis?
- How can data analysis results be interpreted in the context of business decisions?
- What are the limitations of data analysis and the risks of misinterpretation?

Tasks:
- Preparing queries that integrate data from multiple tables
- Analyzing economic data (e.g., sales, customers)
- Building queries for business reports
- Preparing data for visualization
- Preparing a report and presenting the results

Practical activites within the subject

Not applicable

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