



Subject card

Subject name and code	DATASETS AND THEIR PROTECTION, PG_00069543						
Field of study	InfoBioChem						
Date of commencement of studies	February 2026	Academic year of realisation of subject			2025/2026		
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	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Biomedical Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Adam Bujnowski					
	Teachers	dr inż. Adam Bujnowski					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	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	30	2.0		18.0		50
Subject objectives	The course aims to familiarize students with database technologies and electronic documents, as well as methods for processing and securing them. Students learned how to design and process data within relational databases (PostgreSQL) using the SQL language. Data structures such as XML and JSON, as well as systems for their use and processing, were also introduced. Additional information is provided to address cybersecurity, the integrity, and security of the research project.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U03] is able to use statistical tools and IT solutions to analyze biological data and describe the processes occurring within them.		The student is able to select and design tools for effective management of data sets.		[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_W06] knows open biological and chemical databases and the principles of their proper use - appropriate to the curriculum InfoBioChem		The student has the knowledge necessary to use available data sets in their own programming solutions.		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_K03] is ready to formulate questions precisely to deepen one's understanding of a topic or identify missing elements of reasoning		The student is prepared to take into account cybersecurity principles and apply appropriate measures to ensure the security of data and IT systems.		[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	<p>Course content – lecture</p> <p>Basic Concepts: Data, Information, Knowledge, Database, Data Model, Entity, Attribute, Database Management System</p> <p>Flat Data Model, Example, Advantages and Disadvantages</p> <p>Hierarchical and Network Data Models</p> <p>XML as an Example of a Hierarchical Model</p> <p>JSON as a Database</p> <p>Relational Data Model, Structure, Operations, Query Language</p> <p>Object-Oriented and Object-Relational Data Models</p> <p>Elements of Cybersecurity</p> <p>Open Databases</p>											
	<p>Course content – laboratory</p> <p>Relational Database Management Basics</p> <p>SQL Basics</p> <p>Creating Your Own Databases</p> <p>Database Management Using Your Selected Tool</p> <p>Data Security basic tools - Checksums and Data Integration techniques</p>											
Prerequisites and co-requisites	<p>Computing basics</p> <p>Text-based environment (e.g. BASH)</p>											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Lecture - exam</td> <td>50.0%</td> <td>40.0%</td> </tr> <tr> <td>Laboratory - practical realisation of given task</td> <td>50.0%</td> <td>60.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture - exam	50.0%	40.0%	Laboratory - practical realisation of given task	50.0%	60.0%
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Laboratory - practical realisation of given task	50.0%	60.0%										
Recommended reading	Basic literature	<p>Wprowadzenie do systemów baz danych / Elmasri, Navathe. Gliwice, copyright 2019</p> <p>Elmasri Ramez, NavatheB. Shamkant Wprowadzenie do systemów baz danych, Helion 2022</p> <p>Luca Ferrari, Enrico Pirozzi, Learn PostgreSQL. Use, manage, and build secure and scalable databases with PostgreSQL 16 - Second Edition</p>										
	Supplementary literature	<p>The ChEMBL Database in 2023: a drug discovery platform spanning multiple bioactivity data types and time periods.</p> <p>Barbara Zdrazil, Eloy Felix, Fiona Hunter, Emma J Manners, James Blackshaw, Sybilla Corbett, Marleen de Veij, Harris Ioannidis, David Mendez Lopez, Juan F Mosquera, Maria Paula Magarinos, Nicolas Bosc, Ricardo Arcila, Tevik Kizilören, Anna Gaulton, A Patrícia Bento, Melissa F Adasme, Pater Monecke, Gregory A Landrum, Andrew R Leach - Nucleic Acids Res. 2023: gkad1004. doi: 10.1093/nar/gkad1004</p> <p>ChEMBL web services: streamlining access to drug discovery data and utilities.</p> <p>Davies M, Nowotka M, Papadatos G, Dedman N, Gaulton A, Atkinson F, Bellis L, Overington JP. - Nucleic Acids Res. 2015; 43(W1):W612-20, doi: 10.1093/nar/gkv352</p>										
	eResources addresses	<p>Basic</p> <p>https://www.ebi.ac.uk/chembl/ - ChemBL Open Database</p>										
Example issues/ example questions/ tasks being completed	<p>Design a database to assess the effects of a selected compound on living organisms.</p> <p>Under the data model definition, describe the selected data model.</p> <p>Save the required data in XML notation.</p> <p>Save the required data in JSON.</p>											
Practical activities within the subject	<p>Not applicable</p>											

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