



Subject card

|   |  |  |  |                                     |         |  |     |
|---|--|--|--|-------------------------------------|---------|--|-----|
| Subject name and code                       | Databases and data warehouses, PG_00062741   |  |  |                                     |         |  |     |
| Field of study                              | Technologies for Industry 5.0  |  |  |                                     |         |  |     |
| Date of commencement of studies             | October 2026   | Academic year of realisation of subject                  |  |                                     |         | 2027/2028  |     |
| Education level                             | first-cycle studies  | Subject group  |  |                                     |         | Obligatory subject group in the field of study<br>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   |  |                                     |         | 2.0  |     |
| Learning profile                            | general academic profile   | Assessment form  |  |                                     |         | assessment   |     |
| Conducting unit                             | Institute of Physics and Applied Computer Science -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology  |  |  |                                     |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr inż. Bartosz Reichel                                  |  |                                     |         |  |     |
|   | Teachers   |  |  |                                     |         |  |     |
| 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                          | Acquiring knowledge and skills related to relational and non-relational databases, as well as data warehouses.   |  |  |                                     |         |  |     |
| Learning outcomes                           | Course outcome   |  | Subject outcome  |                                     |         | Method of verification   |     |
|   | [K6_W06] demonstrates knowledge related to data analysis and engineering, machine learning, knows the principles of integrating data with management systems to analyze complex engineering and technological problems |  | The student demonstrates knowledge of relational and non-relational databases and data warehouses in order to analyze complex engineering and technological problems.  |                                     |         | [SW1] Assessment of factual knowledge  |     |
|   | [K6_U06] performs analysis, exploration and cleaning of data sets, can use statistical models and machine learning models, integrate various analytical, management and data storage tools                             |  | The student analyzes, explores, and transforms data sets using relational and non-relational databases, and is able to integrate various data analysis, management, and storage tools using data warehouses. |                                     |         | [SU1] Assessment of task fulfilment  |     |

| Subject contents   | <p>Course content – lecture<br/>Introduction to Databases (2 hours)</p> <p>Examples of popular database systems.Relational Databases and SQL (6 hours)</p> <p>Relational Database Extensions (3 hours)</p> <p>NoSQL Databases as Exemplar of MongoDB (4 hours)</p> <p>Aggregations and Queries in MongoDB.Data Warehouses (4 hours)</p> <p>ETL (Extract, Transform, Load) process (4 hours)</p> <p>Dimensions in a data warehouse (3 hours)</p> <p>Data analysis (4 hours)</p>   |   |  |                          |                   |                               |                 |       |       |      |       |       |
|--|--|---|--|--------------------------|-------------------|-------------------------------|-----------------|-------|-------|------|-------|-------|
| Prerequisites and co-requisites                                |  |   |  |                          |                   |                               |                 |       |       |      |       |       |
| Assessment methods and criteria                                | <table border="1"> <thead> <tr> <th data-bbox="456 819 794 842">Subject passing criteria</th> <th data-bbox="799 819 1137 842">Passing threshold</th> <th data-bbox="1142 819 1481 842">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 848 794 871">laboratory test</td> <td data-bbox="799 848 1137 871">60.0%</td> <td data-bbox="1142 848 1481 871">50.0%</td> </tr> <tr> <td data-bbox="456 878 794 900">exam</td> <td data-bbox="799 878 1137 900">60.0%</td> <td data-bbox="1142 878 1481 900">50.0%</td> </tr> </tbody> </table> |   |  | Subject passing criteria | Passing threshold | Percentage of the final grade | laboratory test | 60.0% | 50.0% | exam | 60.0% | 50.0% |
| Subject passing criteria                                       | Passing threshold  | Percentage of the final grade   |  |                          |                   |                               |                 |       |       |      |       |       |
| laboratory test  | 60.0%  | 50.0%   |  |                          |                   |                               |                 |       |       |      |       |       |
| exam   | 60.0%  | 50.0%   |  |                          |                   |                               |                 |       |       |      |       |       |
| Recommended reading  | <p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>  | <p>Walter Shields, SQL. Przewodnik dla początkujących. Jak zacząć efektywną pracę z danymi, Helion</p> <p>Jun Shan, Matt Goldwasser, Upom Malik, Benjamin Johnston, SQL dla analityków danych. Opanuj możliwości SQL-a, aby wydobywać informacje z danych., Wydanie III, Helion</p> <p>Shannon Bradshaw, Eoin Brazil, Kristina Chodorow, Przewodnik po MongoDB. Wydajna i skalowalna baza danych., Wydanie III, Helion</p> <p>Adam Pelikant, Hurtownie danych. Od przetwarzania analitycznego do raportowania., Wydanie II, Helion</p> <p>Jamie Chan, Learn SQL using MySQL in One Day and Learn It Well. SQL for beginners with Hands-on Project,</p> <p>Packt Publishing</p> <p>Alkin Tezuysal, Ibrar Ahmed, Peter Zaitsev, Database Design and Modeling with PostgreSQL and MySQL. Build efficient and scalable databases for modern applications using open source databases, Packt Publishing</p> <p>Brij Kishore Pandey, Emily Ro Schoof, Building ETL Pipelines with Python. Create and deploy enterprise-ready ETL pipelines by employing modern methods, Packt Publishing</p> <p>Nagaraj Venkatesan, Ahmad Osama, Azure Data Engineering Cookbook. Get well versed in various data engineering techniques in Azure using this recipe-based guide, Second Edition, Packt Publishing</p> |  |                          |                   |                               |                 |       |       |      |       |       |
| Example issues/<br>example questions/<br>tasks being completed |  |   |  |                          |                   |                               |                 |       |       |      |       |       |

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|---|----------------|
| Practical activities within the subject | Not applicable |
|---|----------------|

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