



Subject card

|   |   |   |          |                                     |   |            |     |
|---|---|---|----------|-------------------------------------|---|------------|-----|
| Subject name and code                       | Nonrelational databases, PG_00064003  |   |          |                                     |   |            |     |
| Field of study                              | Data Engineering  |   |          |                                     |   |            |     |
| Date of commencement of studies             | October 2024  | Academic year of realisation of subject   |          |                                     | 2026/2027   |            |     |
| Education level                             | first-cycle studies   | Subject group   |          |                                     | Optional subject group<br>Subject group related to scientific research in the field of study  |            |     |
| Mode of study                               | Full-time studies   | Mode of delivery  |          |                                     | blended-learning  |            |     |
| Year of study                               | 3   | Language of instruction   |          |                                     | Polish  |            |     |
| Semester of study                           | 5   | ECTS credits  |          |                                     | 6.0   |            |     |
| Learning profile                            | general academic profile  | Assessment form   |          |                                     | assessment  |            |     |
| Conducting unit                             | Department of Software Engineering -> Faculty of Electronics, Telecommunications and Informatics                            |   |          |                                     |   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  | dr inż. Teresa Zawadzka   |          |                                     |   |            |     |
|   | Teachers  | dr inż. Teresa Zawadzka   |          |                                     |   |            |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture   | Tutorial | Laboratory                          | Project   | Seminar    | SUM |
|   | Number of study hours   | 15.0  | 0.0      | 30.0                                | 30.0  | 0.0        | 75  |
|   | E-learning hours included: 15.0   |   |          |                                     |   |            |     |
| 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   | 75  |          | 5.0                                 |   | 70.0       | 150 |
| Subject objectives                          | The aim of the course is to familiarize students with the basic types of non-relational databases.                          |   |          |                                     |   |            |     |
| Learning outcomes                           | Course outcome  | Subject outcome   |          |                                     | Method of verification  |            |     |
|   | [K6_U07] uses information technologies to improve the acquisition, analysis and processing of data in business applications | The student can design, in accordance with the given specification (based on usage scenarios and competency queries resulting from business applications), a document, graph, and key-value database. In addition, the student can formulate and execute queries in languages (formulas/functions) specific to a given type of non-relational database. |          |                                     | [SU5] Assessment of ability to present the results of task<br>[SU4] Assessment of ability to use methods and tools<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |            |     |
|   | [K6_W07] analyzes business processes in an advanced way in the technical, legal, economic, financial and social context     | The student can select the appropriate type of non-relational database for a specific business application.   |          |                                     | [SW1] Assessment of factual knowledge   |            |     |
|   | [K6_W05] integrates data from multiple sources in order to analyze complex business problems                                | Student potrafi załadować dane do nierelacyjnej bazy danych.  |          |                                     | [SW2] Assessment of knowledge contained in presentation<br>[SW1] Assessment of factual knowledge  |            |     |

| Subject contents   | <p>1. Introduction to NoSQL databases</p> <ul style="list-style-type: none"> <li>- types of NoSQL databases</li> <li>- introduction to distributed databases</li> <li>- CAP</li> <li>- BASE</li> </ul> <p>2. Document databases - MongoDB</p> <p>3. Key-value databases - Redis</p> <p>4. Graph databases - Neo4J</p>  |   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
|--|--|---|--|--------------------------|-------------------|-------------------------------|---------------------|-------|-------|-------|-------|-------|------|-------|-------|
| Prerequisites and co-requisites                                | Knowledge of relational databases.   |   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Assessment methods and criteria                                | <table border="1" data-bbox="451 864 1487 999"> <thead> <tr> <th data-bbox="451 864 794 898">Subject passing criteria</th> <th data-bbox="794 864 1142 898">Passing threshold</th> <th data-bbox="1142 864 1487 898">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="451 898 794 931">Project development</td> <td data-bbox="794 898 1142 931">50.0%</td> <td data-bbox="1142 898 1487 931">35.0%</td> </tr> <tr> <td data-bbox="451 931 794 965">Tasks</td> <td data-bbox="794 931 1142 965">50.0%</td> <td data-bbox="1142 931 1487 965">35.0%</td> </tr> <tr> <td data-bbox="451 965 794 999">Exam</td> <td data-bbox="794 965 1142 999">50.0%</td> <td data-bbox="1142 965 1487 999">30.0%</td> </tr> </tbody> </table> |   |  | Subject passing criteria | Passing threshold | Percentage of the final grade | Project development | 50.0% | 35.0% | Tasks | 50.0% | 35.0% | Exam | 50.0% | 30.0% |
| Subject passing criteria                                       | Passing threshold  | Percentage of the final grade   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Project development  | 50.0%  | 35.0%   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Tasks  | 50.0%  | 35.0%   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Exam   | 50.0%  | 30.0%   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Recommended reading  | <p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>  | <p>1. Professional NoSQL, Shashanki Tiwari, Wiley, 2011.</p> <p>2. MongoDB, The Definitive Guide, Kristina Chodorow, O'Reilly, 2013</p> <p>3. 3. Graph Databases: New Opportunities for Connected Data, Ian Robinson and Jim Webber, O'Reilly 2015.</p> <p>Documentation of NoSQL databases.</p> <p>Adresy na platformie eNauczanie:<br/>Nonrelational databases 2026_2027 - Moodle ID: 42587<br/><a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=42587">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=42587</a></p> |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Example issues/<br>example questions/<br>tasks being completed | <p>1. Model NoSQL database (key-value, document, graph)</p> <p>2. Define and execute queries</p>   |   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |
| Work placement   | Not applicable   |   |  |                          |                   |                               |                     |       |       |       |       |       |      |       |       |

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