#### card of course

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| Subject name | Databases |

1. The placement of the subject in the study system

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| 1.1. Field of study | Computer science |
| 1.2. Form and path of study | Full-time/Part-time |
| 1.3. Level of education | First-cycle studies |
| 1.4. Study profile | Practical |

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| 1. 5. Specialty | - |
| 1.6. Subject Coordinator | Dr Monika Kaczorowska; mgr Przemysław Sujka |

2. General characteristics of the subject

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| 2.1. Belonging to a subject group | Directional/Practical |
| 2.2. Number of ECTS | 5 |
| 2.3. Language of lectures | English |
| 2.4. Semesters in which the subject is taught | II |
| 2.5.Criteria for selecting course participants | - |

1. Learning outcomes and course delivery
   1. Subject Objectives

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| No. | Subject Objectives |
|
| C1 | Acquiring knowledge of relational databases. |
| C2 | Acquiring skills in creating relational databases. |
| C3 | Acquiring the ability to create queries in SQL. |
| C4 | Developing skills in using various relational database systems. |
| C5 | Acquiring skills in data manipulation and data mining in a relational database |
| C6 | Acquiring the skills to create and administer a database in a selected database environment |

* 1. Subject-specific learning outcomes, divided into knowledge , skills and competences , with reference to the directional learning outcomes

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| No. | Description of subject  learning outcomes | Reference to  directional effects  learning (symbols) | Method of implementation (mark "X") | | | |
| ST | | NST | |
| Classes at the University | Activities on  the platform | Classes at the University | Activities on  the platform |
| After passing the course, the student knows and understands **the knowledge** | | | | | | |
| W1 | concepts related to relational database design, types of database systems: relational and non-relational | INF\_W03  INF\_W04 | X |  |  | X |
| W2 | principles of database design in SQL, | X |  |  | X |
| W3 | rules for creating and types of relationships between tables, | X |  |  | X |
| W4 | principles of operation of database systems. | X |  |  | X |
| W5 | The student has knowledge about how to manipulate data in a relational database, create queries to a relational database | X |  |  | X |
| W6 | The student has knowledge of basic database management in the selected database environment. | X |  |  | X |
| After passing the course, the student is **able** to: | | | | | | |
| U1 | independently search and analyze content from sources available on the Internet, literature and AI applications | INF\_U01 INF\_U14 INF\_U27 | X |  | X |  |
| U2 | design a relational database model and implement the database according to the given specification, | X |  | X |  |
| U3 | use SQL commands to: create, modify and delete objects in the database and search, filter and sort data, | X |  | X |  |
| U4 | process data using data mining methods. | X |  | X |  |
| U5 | The student is able to design a database structure according to given functionality. | X |  | X |  |
| U6 | The student is able to manipulate data in a relational database. | X |  | X |  |
| U7 | The student is able to define queries for a relational database. | X |  | X |  |
| After completing the course, the student is ready to take part in **social competences.** | | | | | | |
| K1 | taking responsibility for the decisions you make, | INF\_K02  INF\_K05 | X |  | X |  |
| K2 | The student is able to identify and resolve dilemmas related to the creation of modern databases, including those related to cooperation with the database user. | X |  | X |  |

3.3. Forms of teaching and their number of hours - Full-time studies (ST), Part-time studies (NST)

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| Path | Lecture | Exercises | Design | Workshop | Laboratory | Seminar | Lecturer | Classes conducted using distance learning methods and techniques in the form of a lecture | Other | **ECTS points** |
| **ST** | 30 |  |  |  | 40 |  |  |  |  | 5 |
| **NST** |  |  |  |  | 15 |  |  | 10 |  | 5 |

3.4. Content of education (separately for each form of classes: (W, ĆW, PROJ, WAR, LAB, LEK, OTHER). It should be marked (X) how the given content will be implemented (classes at the university or classes on the e-learning platform conducted using distance learning methods and techniques)

TYPE OF CLASS: LECTURE

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| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject-specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Introduction to databases. Division of databases. Relational databases. Applications of databases. MySQL database management system. Data models. | W1, W2, W4 | X |  |  | X |
| 2. | Elements of relational databases. Basic database concepts. Types of relationships | W1, W3 | X |  |  | X |
| 3. | Relational database queries. Conditional statements. Data aggregation. Table joins. Subqueries. | W5 | X |  |  | X |
| 4. | Advanced database queries including the use of pivot and window functions. | W5 | X |  |  | X |
| 5. | Database Design. Data Normalization. ERD Schema. Data Manipulation | W1, W5 | X |  |  | X |
| 6. | Database Management. User Creation. Backup | W6 | X |  |  | X |
| 7. | Google Big Query – practical use example. | W1, W5 | X |  |  | X |
| 8. | Introduction to Non-Relational Databases | W1 | X |  |  | X |
| 9. | Summary of classes and discussion of grades. |  | X |  |  | X |

TYPE OF CLASS: LABORATORY

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| --- | --- | --- | --- | --- | --- | --- |
| No. | Content of the course | Reference to subject -specific learning outcomes | Method of implementation (mark "X") | | | |
| ST | | NST | |
| **Classes at the University** | **Activities on  the platform** | **Classes at the University** | **Activities on  the platform** |
| 1. | Basic SQL commands. | U1, U7, K1 | X |  | X |  |
| 2. | Creating tables and relationships in SQL. | U1, U2, K1 | X |  | X |  |
| 3. | Inserting, updating and deleting records. | U2, K1, K2 | X |  | X |  |
| 4. | JOIN table joins. | U3, U4, K1 | X |  | X |  |
| 5. | Creating, deleting, and updating database objects. | U1, U2, U5, U6, K1, K2 | X |  | X |  |
| 6. | Summary of classes and discussion of grades. |  | X |  | X |  |

3.5. Methods of verifying learning outcomes (indication and description of methods of conducting classes and verification of achievement of learning outcomes and method of documentation)

Methods of verifying learning outcomes:

Lecture – exam – 100% final grade

Laboratory:

I colloquium - includes work with MS Access - creating a database, assigning restrictions to data, defining data types, input masks, creating a form, report and queries based on the prepared command. The prepared database and the executed commands are assessed - 50% of the final grade.

The second colloquium includes tasks using the syntax of the structured query language SQL, using PostgreSQL terminology. The commands include creating tables, selecting information from tables, aggregating functions and operations combining tables. The created syntaxes are saved as a text file or in the .sql format - 50% of the final grade.

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| Subject Effects | Teaching methods | Methods of verifying learning outcomes | Documentation methods |
| KNOWLEDGE | | | |
| W1-W6 | Multimedia presentations, discussion, presentation of practical tasks, live coding | Exam | Graded exam sheet |
| SKILLS | | | |
| U1-U7 | discussion, case study, performing exercises, presentation of practical tasks, live coding | Two final tests (described above) | Graded colloquia |
| SOCIAL COMPETENCES | | | |
| K1-K2 | discussion, case study, performing exercises, presentation of practical tasks, live coding | Two final tests (described above) | Graded colloquia |

3.6 . Criteria for assessing the achieved learning outcomes

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| Learning effect | For a grade of 3 or "pass."  the student knows and understands/is able to/is ready to | For a grade of 3.5, the student knows and understands/is able to/is ready to | For a grade of 4, the student knows and understands/is able to/is ready to | For a grade of 4.5, the student knows and understands/is able to/is ready to | For a grade of 5, the student knows and understands/is able to/is ready to |
| W | 51-60% of knowledge indicated in learning outcomes | 61-70% of knowledge indicated in learning outcomes | 71-80% of knowledge indicated in learning outcomes | 81-90% of knowledge indicated in learning outcomes | 91-100% of knowledge indicated in learning outcomes |
| U | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |
| K | 51-60% of skills indicated in learning outcomes | 61-70% of skills indicated in learning outcomes | 71-80% of skills indicated in learning outcomes | 81-90% of skills indicated in learning outcomes | 91-100% of skills indicated in learning outcomes |

3.7. Literature

**Basic**

1. Finch Victor; Data Analytics For Beginners: Your Ultimate Guide To Learn And Master Data Analysis. Get Your Business Intelligence Right – Accelerate Growth And Close More Sales; Createspace Independent Publishing Platform; Scotts Valley 2017
2. B. Forta, SQL w mgnieniu oka. Opanuj język zapytań w 10 minut dziennie. Wydanie V. Gliwice
3. L. Rockoff, Język SQL. Przyjazny podręcznik. Wydanie III.
4. Welling, Luke. MySQL : podstawy / Luke Welling, Laura Thomson ;[tł. Marek Koszykowski]. Gliwice : Helion, 2005. ISBN 83-7361-689-6

**Supplementary**

1. [**https://www.w3schools.com/sql/**](https://www.w3schools.com/sql/)
2. [**https://dev.mysql.com/doc/**](https://dev.mysql.com/doc/)
3. Dyer, Russell J. T. MySQL : almanach / Russell J.T. Dyer ; [tł. Rafał Jońca]. Gliwice : Helion, 2006. – 336.
4. DuBois Paul; MySQL; Mikom; Warszawa; 2000

4. Student workload - ECTS points balance

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| --- | --- | --- |
| **Types of student activity** | **Student Load** | |
| **ST** | **NST** |
| **Classes requiring direct contact between the student and the academic teacher at the university premises** | **70** | **25** |
| Classes included in the study plan | 70 | 25 |
| **Student's own work** | **55** | **100** |
| Ongoing preparation for classes, preparation of project work/presentations/etc. | 30 | 50 |
| Preparation for passing classes | 25 | 50 |
| **TOTAL STUDENT HOURLY LOAD** | **125** | **125** |
| **Number of ECTS points** | **5** | **5** |

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| Last change date | 30/09/2024 |
| The changes were introduced | INF Education Quality Team |
| The changes were approved | Arkadiusz Gwarda, M.A. |