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| **WSB UNIVERSITY Branch/Department of Jaworzno** | | | | | | | | | |
| **Field of study: Computer Science** | | | | | | | | | |
| **Subject: Databases** | | | | | | | | | |
| **Educational profile: practical** | | | | | | | | | |
| **Level of education: undergraduate studies** | | | | | | | | | |
| **Number of hours**  **per semester** | | 1 | | | 2 | | 3 | | 4 |
| I | II | | III | IV | V | VI | VII |
| **Full-time studies**  (w/w/lab/pr/e)\* | |  |  | |  | **16w / 16lab** |  |  |  |
| **Part-time studies**  (w/æw/lab/pr/e) | |  |  | |  | **12w / 12lab** |  |  |  |
| **LANGUAGE OF**  **INSTRUCTION** | | Polish | | | | | | | |
| **LECTURER** | | Dr.-Ing. Badura Dariusz, Prof. AWSB, M.Sc. Pawlak Bartłomiej | | | | | | | |
| **FORM OF ACTIVITIES** | | Lecture, laboratory, consultation | | | | | | | |
| **SUBJECT**  **OBJECTIVES** | | The aim is to introduce the student to database issues. Relational database issues are presented. The  SQL language is introduced as well as databases of the type, No-SQL | | | | | | | |
| **Reference to learning outcomes** | | | | **Description of learning outcomes** | | | **Means of verification of the effect** **learning** | | |
| **Directional effect** | **PRK** | | |
| **NEWS** | | | | | | | | | |
| INF\_W04 | P6S\_WG | | | The student has a structured, theoretically based knowledge of databases. | | | • Written examination | | |
| INF\_W04 | P6S\_WG | | | The student knows and understands the relational model of databases. | | | * Written examination * Completion of relevant laboratory tasks, working in groups. | | |
| INF\_W11 | P6S\_WG | | | The student knows and understands the principles of designing database systems both based on physical and logical models according to the principles of standardisation. | | | * Written examination * Completion of relevant laboratory tasks, working in groups. | | |
| INF\_W10 | P6S\_WG | | | The student knows and understands data manipulation methods, operations such as DQL, DML, DDL. | | | * Written examination * Completion of relevant laboratory tasks, working in groups. | | |
| **SKILLS** | | | | | | | | | |
| INF\_U10  INF\_U11 | P6S\_UW  P6S\_UW | | | The student is able to design and implement usable database systems based on standardisation principles by creating source code (scripts). | | | * Completion of relevant laboratory tasks, working in groups. * Card. | | |
| INF\_U07 | P6S\_UK | | | The student is able to present the completed database schema clearly. | | | • Presentation and discussion of the laboratory exercise performed. | | |
| INF\_U03 | P6S\_UW | | | The student is able to manipulate a lot of data placed in a relational database. | | | • Completion of relevant laboratory tasks, working in groups. | | |
| INF\_U08 | P6S\_UU | | | Able to independently acquire the relevant knowledge and skills necessary to complete | | | • Completion of relevant laboratory tasks, working in groups. | | |

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|  |  | laboratory tasks. |  |
| **SOCIAL COMPETENCES** | | | |
| INF\_K01 | P6S\_KK | The student is ready to critically evaluate his/her knowledge and perceived content concerning the achievements of computer science, recognizing the importance of knowledge in solving cognitive problems | Observation of students during classes |
| **Student workload (in teaching hours 1h =45 minutes)\*\*** | | | |
| **Stationary Part-time**  attendance at lectures = 16 attendance at lectures = 12 participation in exercises = 16 participation in exercises = 12 preparation for exercise = 30 preparation for exercise = 32 lecture preparation = 20 lecture preparation = 26 exam preparation = 10 exam preparation = 10  implementation of project tasks = implementation of project tasks =  e-learning = e-learning =  Pass/examination = 4 Pass/examination = 4 other (consultation) = 4 other (consultation) = 4  **TOTAL: 100h TOTAL: 100h**  **Number of ECTS credits: 4 Number of ECTS credits: 4**  **including in practical classes: 2 including in practical classes: 2** | | | |
| **PREREQUISITES** | Fundamentals of computer programming, including object-oriented programming. | | |
| **SUBJECT**  **CONTENT** | Lecture:   * Introduction to database issues * Relational data model * File organisation, * SQL language * Indexes, * Transactional processing, * Algorithms for managing concurrent execution of transactions     Lab:   * Relational database design, normalisation, good practice and patterns, constraints, relationships, attributes, indexes, data types, keys..., * Database modelling from both the physical and logical model side, ERD diagrams..., * Implementation of the created model in the form of source code (scripts), DDL operations in the selected database environment, * Semantics and syntax for database read operations (Select - DQL), * Semantics and syntax for record modification operations in the database (Update, Delete, Insert - DML)..., * Exercises in building queries, joins, grouping, sorting, creating conditions, applying time functions, aggregating based on various tasks and business processes modelled in the relevant database..., * Exercises in adding new objects to the database, deleting them and updating them, * An introduction to the more advanced elements of databases - subqueries, views, procedures, functions, table types, how to optimise databases, triggers, transactions, temporary tables. | | |
| **LITERATURE**  **COMPULSORY** | * Date C. J., An Introduction to Database System, vol. II, Adison-Wesley Pub. Comp., also WNT - W-wa, (series: Klasyka Informatyki), latest edition * Elmasri R., Navathe S., Fundamentals of Database Systems, Adison-Wesley Pub. Comp.,(4th Edition), 2002 * Garcia-Molina H., Ullman J.D., Widom J., Implementation of database systems, WNT, 2003   (series: Klasyka Informatyki) | | |
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| **LITERATURE**  **SUPPLEMENTARY** | * Elmasri R., Navathe S., Introduction to Database Systems, Helion Publishers, (4th Edition), 2005 * R. Ramakrishnan, J. Gehrke, Database Management Systems, 2nd edition, WCB/McGraw-Hill, 2001 * [L. Rockoff,](https://helion.pl/autorzy/larry-rockoff) The SQL language. A friendly handbook. 2nd Edition, Helion, Gliwice, 2017, * C. J. Date, Relational databases. Helion, Gliwice 2006, * P. Wilton, J. Colby, SQL. From scratch. Helion, Gliwice, 2005. | | |
| **TEACHING**  **METHODS** | Lectures, laboratories using the Onlinewsb platform and MS Teams applications, virtual laboratories.   * Brief theoretical introduction using a multimedia projector, * Demos demonstrating the use of relevant tools, technologies and then performing tasks on computers independently and under supervision with guidance from the instructor. | | |
| **LEARNING AIDS** | Multimedia presentations, tools to help perform relevant data operations (in this case MS SQL SERVER). | | |
| **PROJECT** | Not applicable | | |
| **FORM AND**  **CONDITIONS OF**  **PASSING** | Written exam.  Tasks performed in groups on the basis of data presented in class. Successful completion of all laboratories is a prerequisite for passing. Independent completion of specified tasks. | | |