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| **WSB University**  |
| **Field of study: Management**  |
| **Module / course: Data bases and introduction to Big Data** |
| **Educational profile: practical** |
| **Education cycle: I cycle studies** |
| **Number of hours per semester** | 1 | 2 | 3 |
| I | II | **III** | IV | V | VI |
| **Full time studies****(L/C/lab/pr/e)** |  |  | **18L/24LAB** |  |  |  |
| **Part-time studies****(L/C/lab/pr/e)** |  |  |  |  |  |  |
| **LECTURER** | PhD Eng. Karol Jędrasiak, PhD Tomasz Staś |
| **FORM OF CLASSES** | Laboratory, Lecture |
| **COURSE OBJECTIVES** | * Introduction to modern database systems and big data
* Familiarize yourself with good database and data warehouse practices for Big Data analysis
* Familiarize yourself with commonly used methods of extraction of data from heterogeneous sources
* Introduction to designing simple and complex queries
* Familiarize yourself with typical ERD diagrams
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| **Course objectives** | **References to course objectives:** | **Description of educational results**  | **Verification of educational results** |
| **Field-related learning outcomes**  | **Area-related learning outcomes**  | **Knowledge** |
| **DataBa\_K01** | Z\_W11 | S1P\_W06 | Knowledge of the use of databases and data warehouses in management and business | * Completion of the oral submission of the draft dossier
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| **DataBa\_K02** | Z\_W11Z­\_W12 | S1P\_W06 | Knowledge of the use of analytical information in building a company's market advantage | * Completion of the oral submission of the draft dossier
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| **DataBa\_K03** | Z\_W11 | S1P\_W06 | Knowledge of data integration from heterogeneous sources | * Completion of the oral submission of the draft dossier
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|  |  |  | **Abilities** |
| **DataBa\_A04** | Z\_U12 | S1P\_U06S1P\_U07 | Ability to normalize database patterns. | * Evaluation of the prepared project, oral credit
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| **DataBa\_A05** | Z\_U12 | S1P\_U06S1P\_U07 | Ability to create ERD diagrams for database schema modeling | * Evaluation of the prepared project, oral credit
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| **DataBa\_A06** | Z\_U07 | S1P\_U03 | Ability to solve tasks | * Evaluation of the prepared project, oral credit
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| **DataBa\_A07** | Z\_U11 | S1P\_U06S1P\_U07 | Can use troubleshooting methods | * Evaluation of the prepared project, oral credit
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| **DataBa\_A08** | Z\_U16 | S1P\_U09 | They can document their work | * Evaluation of the prepared project, oral credit
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|  |  |  | **Social competences:** |
| **DataBa\_S09** | Z\_K01 | S1P\_K01 S1P\_K06 | The student is aware of the importance of group work roles, assignment of tasks and role of communication in the project team | * Understanding the roles and tasks assigned to the team and the degree of completion is part of the documentation
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| **Student effort (1h dyd =45 minutes)\*\*** |
| **Full- time**Participation in lectures = 18hParticipation in / laboratory = 24hPreparation to classes / laboratory = 22hPreparation to lectures = 8hPreparation to an examination = 12hProject tasks =e-learning =Credit/examination = 4hothers (indicate which) = **TOTAL: 88h****ECTS points: 3.5****Including practical classes: 2** | **Part-time**Participation in lectures = Participation in classes = Preparation to classes = Preparation to lectures = Preparation to an examination = Project tasks =e-learning =Credit/examination =others (indicate which) = **TOTAL:****ECTS points:****Including practical classes:** |
| **DESCRIPTION OF THE SUBJECT MATTER** | The aim of the classes is to familiarize students with the database systems used in the Big Data analysis. As part of the classes, students will be familiar with the justification for the need for databases in modern enterprises. Historically and typically used database systems will be presented. Students will then be familiar with the modern approach to database design and modeling. As part of the classes, students will learn about good practices of designing database schemes, normalizing schemas, creating simple and complex database queries. Students will practice issues related to the design of queries corresponding to typical management and state security entities. The final step will be to apply the acquired knowledge in practice in order to carry out the project. |
| **Prerequisites** | The subject requires knowledge of the basics of preparing data for further analysis |
| **COURSE CONTENT****(Division to contact classes and e-learning)** | Direct content:* Modern database applications
* Introduction to databases
* Presentation of database management systems
* Presentation of the data models used
* Presentation of data warehouses
* Data extraction processes
* Transform a conceptual model to a relational model
* Standardization of the relational model
* SQL Basics
* Advanced Query Creation Part 1
* Advanced Query Creation Part 2
* Triggers
* Use database systems for Big Data analysis
* Concurrent processing and use of graphics cards
* Implementation of the project
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| **LITERATURE****(compulsory reading)** | B. Thornton, G. Perreault, Becoming a Data-Based Leader: An Introduction. NASSP Bulletin 2002, Vol. 86 (630) (Sage Journals)* R. Khurana, Information Modeling for Achieving Integrity in Data Bases for Open Systems. Paradigm 2005, vol. 9 (1). (Sage Journals)
* Baghal A . at al., Factors Associated with Increased Adoption of a Research Data Warehouse. Studies In Health Technology And Informatics 2019, Vol. 257 (EBSCO)
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| **OPTIONAL LITERATURE** | Luke Welling, Laura Thomson, "MySQL. Basics", Helion 2005,Hand D. and others, Data Mining, WNT, Warsaw 2005,M. Jarke, M. Lenzerini, Y. Vassiliou, P. Vassiliadis. Data warehouses. Basis of organization and functioning, WSiP, Warsaw 2003.V. Poe, P. Klauer, S. Brobst. Create a data warehouse. WNT, Warsaw 2000.H. Garcia-Molina, J.D. Ullman, J. Widom, "Implementation of Database Systems", WNT 2003,Pelican A., Data Warehouses. From analytical processing to reporting, Helion, Gliwice 2011,Sturm J., SQL Server Data Warehouses 7.0 Technical Guide, Microsoft Press, 1999,Todman Ch., Design data warehouse. Supporting customer relationship management, Helion, Gliwice, 2011. |
| **TEACHING METHODS****(Division to contact classes and e-learning)** | **Contact hours:**Slide show, traditional array method, presentation of programs and their launch in a computer environment**E-learning:** Not applicable |
| **PROJECT****(if implemented in the framework of a classes module)** | Not applicable |
| **TEACHING AIDS** | * Room with computer station
* Whiteboard classes
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| **METHOD Of ASSESSMENT****(Division to contact classes and e-learning**  | Presentation in the project group with documentation |
| **FORM AND CONDITIONS OF ASSESSMENT** | The condition for obtaining credit is to obtain a positive assessment from all forms of credit provided for in the curriculum, taking into account the quantitative evaluation criteria set out in the Framework System of Student Assessments at the WSB University. |