**SYLLABUS**

**Spring semester 2021-2022 year**

**on the educational program "****6B06102 – Information systems"**

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| **Discipline’s code** | **Discipline’s title** | **Individual student work (ISW)** | **No. of hours per week** | | | | | **Number of credits** | **Individual student work with teacher (ISWT)** |
| **Lectures (L)** | **Practical training (PT)** | | **Laboratory (LW)** | |
| **OSQL 3302** | Basics of SQL | 98 | 15 | – | | 30 | | 5 | 6 |
| **Academic information about the course** | | | | | | | | | |
| **Type of training** | **Type of course** | **Types of lectures** | | | **Types of practical training** | | **Number of IWS** | | **Form of final control** |
| Online / Offline | Theoretical , practical | Informational , subject-oriented | | | Tasks for writing SQL queries to solve the tasks | | 3 | | Test |
| **Lecturer** | Karyukin Vladislav Igorevich | | | | | | Office hours | | Scheduled |
| **e-mail** | [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com) , [vladislav.karyukin@kaznu.kz](mailto:vladislav.karyukin@kaznu.kz) | | | | | |
| **Phone** | +77019405992 | | | | | |
| **Laboratory works** | Karyukin Vladislav Igorevich | | | | | | Office hours | | Scheduled |
| **e-mail** | [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com) , [vladislav.karyukin@kaznu.kz](mailto:vladislav.karyukin@kaznu.kz) | | | | | |
| **Phone** | +77019405992 | | | | | |

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| **Academic course presentation** |

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| **Aim of course** | **Expected Learning Outcomes (LO)**  As a result of studying the discipline the undergraduate will be able to: | **Indicators of LO achievement (ID)**  (for each LO at least 2 indicators) |
| Learning and practical application of database skills and writing SQL requests of varying complexity | 1. Know the theoretical foundations of databases | * 1. Ability to create new databases in a specific DBMS   2. Ability to create tables in a database   3. Know the types of relationships between database tables |
| 1. Write SQL database structure management queries | * 1. Writing queries to create new tables   2. Writing queries for updating table structure   3. Writing queries to delete tables |
| 1. Write SQL data management queries in tables | * 1. How to add new records to a table   2. Skills for updating records in a table   3. Ability to delete records in a table |
| 1. Create data warehouses and OLAP cubes | * 1. Ability to develop new data warehouses   2. Ability to write multidimensional MDX queries   3. Skills in creating new measures, dimensions and deploying OLAP cubes |
| 1. Reporting at Microsoft power BI | 5.1 Uploading data to Power BI  5.2 Converting Data to Power BI  5.3 Data visualization in Power BI |
| **Prerequisites** | Database Basics | |
| **Postrequisites** | Data Warehouse and OLAP technologies | |
| **Information resources** | 1. Mr. Sudhir Warier. Data Warehousing Essentials Paperback – May 26, 2011. 2. Fernando Almeida, Practical SQL Guide for Relational Databases, 2016. 3. Walter Shields. SQL QuickStart Guide: The Simplified Beginner's Guide to Managing, Analyzing, and Manipulating Data With SQL Paperback – Illustrated, November 18, 2019 4. Steve Tail. **SQL: The Ultimate Beginners Guide: Learn SQL Today, 2016** 5. **Alan Beaulieu. Learning SQL, 2020** | |

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| **Academic policy of the course in the context of university moral and ethical values** | **Rules of academic conduct:**  All students are required to register for the MOOC. The deadlines for completing the modules of the online course must be strictly observed in accordance with the schedule for studying the discipline.  **ATTENTION!** Failure to meet deadlines results in loss of points! The deadline for each task is indicated in the calendar (schedule) for the implementation of the content of the training course, as well as in the MOOC.  **Academic values:**  - Practical/laboratory exercises, SIW should be independent, creative.  - Plagiarism, forgery, the use of cheat sheets, cheating at all stages of control are unacceptable.  - Students with disabilities can receive counseling assistance at the e-mail address [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com). |
| **Evaluation and attestation policy** | **Criteria-based evaluation:**  assessment of learning outcomes in relation to descriptors (verification of the formation of competencies in midterm control and exams).  **Summative evaluation:** assessment of work activity in an audience (at a webinar); assessment of the completed task.  The final grade for the discipline is calculated according to the following formula:  , here, BC – boundary control; MT - midterm; FC – final control (exam).  **6.5.** The scale of assessment is given in the curriculum (syllabus) (especially for 1st year graduates):   |  |  |  |  | | --- | --- | --- | --- | | Evaluation by letter system | Numerical equivalent of points | Points (in %) | Evaluation according to the traditional system | | А | 4,0 | 95-100 | Excellent | | А- | 3,67 | 90-94 | | В+ | 3,33 | 85-89 | Good | | В | 3,0 | 80-84 | | В- | 2,67 | 75-79 | | С+ | 2,33 | 70-74 | | С | 2,0 | 65-69 | Satisfactory | | С- | 1,67 | 60-64 | | D+ | 1,33 | 55-59 | | D | 1,0 | 50-54 | | FX | 0,5 | 25-49 | Unsatisfactory | | F | 0 | 0-24 | |

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| Weeks | Topic name | LO | ID | Amount of hours | Maximum score | Form of Knowledge Assessment | Form of the lesson  /platform |
| 1 | **L1.** Introduction to databases and the SQL language | LO1 | ID 1.1. | 1 | 0 |  | Video lecture  in MS Teams |
| 1 | **LW1.** Simple SQL queries | LO2  LO3 | ID 2.1  ID 3.1  ID 3.2 | 2 | 10 | Report | Video tutorials in MS Teams |
| 2 | **L2.** Database concepts | LO1 | ID 1.2  ID 1.3 | 1 | 0 |  | Video lecture  in MS Teams |
| 2 | **LW2.** SQL requests with conditions | LO2  LO3 | ID 2.1  ID 2.2  ID 3.1  ID 3.2 | 2 | 10 | Report | Video tutorials in MS Teams |
| 3 | **L3.** Database objects | LO1 | ID 1.1  ID 1.2  ID 1.3 | 1 | 0 |  | Offline |
| 3 | **LW3.** Creating queries with related tables | LO2  LO3 | ID 2.1  ID 2.2  ID 3.1  ID 3.2 | 2 | 10 | Report | Offline |
| 3 | **ISWT1.** Consultation on implementation of ISW1. Database Design | LO1 | ID 1.1  ID 1.2  ID 1.3 |  | 25 | Quiz | Offline |
| 4 | **L4.** SQL requests and their types | LO3 | ID 3.1  ID 3.2  ID 3.3 | 1 | 0 |  | Offline |
| 4 | **LW4.** Using Aggregate Functions in SQL | LO3 | ID 3.1  ID 3.2  ID 3.3 | 2 | 10 | Report | Offline |
| 5 | **L5.** DDL (Data Definition Language) | LO3 | ID 3.1  ID 3.2  ID 3.3 | 1 | 0 |  | Offline |
| 5 | **LW5.** SQL subqueries | LO3 | ID 3.1  ID 3.2  ID 3.3 | 2 | 10 | Report | Offline |
| 5 | **ISWT2.** The check of ISW1 | LO1 | ID 1.1  ID 1.2  ID 1.3 |  | 25 | Presentation | Offline |
| 5 | **BC 1** |  |  |  | 100 |  |  |
| 6 | **L6.** DML (Data Management Language) | LO3 | ID 3.1  ID 3.2 | 1 | 0 |  | Offline |
| 6 | **LW6.** Creating Views | LO3 | ID 3.1  ID 3.2  ID 3.3 | 2 | 10 | Report | Offline |
| 7 | **L7.** SQL Stored Procedures server | LO2 | ID 2.1  ID 2.2  ID 2.3 | 1 | 0 |  | Offline |
| 7 | **LW7.** Views in SQL | LO3 | ID 3.1  ID 3.2 | 2 | 10 | Report | Offline |
| 7 | **ISWT3.** Consultation on the implementation of ISW2. Filling database tables, writing SQL queries to tables | LO2  LO3 | ID 2.1  ID 2.2  ID 3.1  ID 3.2 |  | 25 | Quiz | Offline |
| 8 | **L8.** Creating SQL Triggers server | LO2 | ID 2.1  ID 2.2  ID 2.3 | 1 | 0 |  | Offline |
| 8 | **LW8.** Creating SQL Stored Procedures server | LO2 | ID 2.1  ID 2.2  ID 2.3 | 2 | 10 | Report | Offline |
| 9 | **L9.** Transactions in SQL server | LO2 | ID 2.1  ID 2.2  ID 2.3 | 1 | 0 |  | Offline |
| 9 | **LW9**. Creating Triggers in SQL server | LO3 | ID 3.1  ID 3.2 | 2 | 10 | Report | Offline |
| 10 | **L10.** Data Warehouse and OLAP | LO4 | ID 4.1  ID 4.2  ID 4.3 | 1 | 0 |  | Offline |
| 10 | **LW10.** Creating a Multivariate Data Analysis Project in Visual Studio | LO4 | ID 4.1  ID 4.2  ID 4.3 | 2 | 10 | Report | Offline |
| 10 | **ISWT 4.** The check of ISW 2 | LO2  LO3 | ID 1.1  ID 1.2  ID 1.3  ID 3.1  ID 3.2  ID 3.3 |  | 25 | Presentation | Offline |
| 10 | **MT (Midterm Exam)** |  |  |  | 100 |  |  |
| 11 | **L11.** OLAP Design | LO4 | ID 4.1  ID 4.2  ID 4.3 | 1 | 0 |  | Offline |
| 11 | **LW11.** Deploying an OLAP cube | LO4 | ID 4.1  ID 4.2  ID 4.3 | 2 | 10 | Report | Offline |
| 12 | **L12.** Building OLAP measures and dimensions | LO4 | ID 4.1  ID 4.2  ID 4.3 | 1 | 0 |  | Offline |
| 12 | **LW12.** Cube Definition and Deployment | LO4 | ID 4.1  ID 4.2  ID 4.3 | 2 | 10 | Report | Offline |
| 13 | **L13.** OLAP cubes and MDX query language | LO4 | ID 4.1  ID 4.2  ID 4.3 | 1 | 0 |  | Offline |
| 13 | **LW13.** Data upload to Microsoft Power BI | LO5 | ID 5.1 | 2 | 10 | Report | Offline |
| 13 | **ISWT5.** Consultation on the implementation of ISW3. Building OLAP cubes | LO4 | ID 4.1  ID 4.2  ID 4.3 |  | 25 | Quiz | Offline |
| 14 | **L14.** Microsoft Analytics Platform Overview power BI | LO5 | ID 5.1  ID 5.2  ID 5.3 | 1 | 0 |  | Offline |
| 14 | **LW14.** Building reports with visualization of trends | LO5 | ID 5.1  ID 5.2  ID 5.3 | 2 | 10 | Report | Offline |
| 15 | **L15.** Publishing Reports to Microsoft power BI | LO5 | ID 5.1  ID 5.2  ID 5.3 | 1 | 0 |  | Offline |
| 15 | **LW15.** Uploading data from Internet sources to Microsoft power BI | LO5 | ID 5.1  ID 5.2  ID 5.3 | 2 | 10 | Report | Offline |
| 15 | **ISWT 6.** The check of ISW 3 | LO4 | ID 4.1  ID 4.2  ID 4.3 |  | 25 | Presentation | Offline |
| 15 | **BC2** |  |  |  | 100 |  |  |

Abbreviations: – QS – questions for self-examination; ST - standard tasks; IT - individual tasks; Q - quiz; IC - intermediate control.

Chairman of the methodological council Gusmanova F.R.

Head of the Department Musiralieva Sh. Zh.

Lecturer Karyukin V.I.