**Syllabus**

**Spring semester 2022-2023 academic year**

**on the educational program «6B06102 – Information systems»**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Discipline’s code | | Name of the discipline | Individual student work  (ISW) | A number of hours in a week | | | | Number of credits | Individual student work with teacher (ISWT) |
| **Lectures (L)** | **Practical training (PT)** | **Laboratory (LW)** | |
| AS 3220 | | Network administration | 98 | 15 | 0 | 30 | | 5 | 6 |
| Academic Course Information | | | | | | | | | |
| Form of education | | **Type of the course** | **Type of the lecture** | | **Types of practical training** | | **Form of final control** | | |
| Offline / Online | | Theoretical, practical | Problem-oriented | | Learning the theories of networking and configuring network devices | | Written exam / Test | | |
| Lecturer | | Karyukin Vladislav Igorevich | | | | |  | | |
| e-mail | | [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com), [vladislav.karyukin@kaznu.kz](mailto:vladislav.karyukin@kaznu.kz) | | | | |
| Telephone number | | +77019405992 | | | | |
| Aim of course | **Expected Training Results (RO) \***  As a result of the study of the discipline, the student will be able to: | | | | **Indicators of RO achievement (ID)**  (for each thrust reverser not less than 2 indicators) | | | | |
| This course aims at developing and administering networking topologies, Cisco devices’ configuration and troubleshooting | 1. (cognitive) Know theoretical and methodological concepts of networking | | | | * 1. Ability to build configure network topologies   2. Knowing the features and specifications of all seven layers of the OSI model | | | | |
| 2. (functional) Apply knowledge of working with CISCO network devices | | | | 2.1 Configuring switches and routers 2.2 Developing complex topologies | | | | |
| 3. (functional) Development of the routing configurations | | | | 3.1 Configuring the communication between network devices and hosts in different networks   * 1. Configuring static and dynamic routes | | | | |
| 4. (system) Configuring the security of devices | | | | 4.1 – creating access control lists to prevent unauthorized traffic in the networks 4.2 – use DHCP and NAT protocols in the networks | | | | |
| Prerequisites | Information and communication technologies | | | | | | | | |
| Postrequisites | Cloud technologies | | | | | | | | |
| Information resources \*\* | **Main:** Wendell O. “CCNA 200-301 Official Cert Guide Library,” Cisco Press, 2019.[Glen E Clarke](https://www.amazon.com/Glen-E-Clarke/e/B001KD1TU6/ref=dp_byline_cont_book_1) (Author), [Richard Deal](https://www.amazon.com/s/ref=dp_byline_sr_book_2?ie=UTF8&field-author=Richard+Deal&text=Richard+Deal&sort=relevancerank&search-alias=books) (Author), “CCT/CCNA Routing and Switching All-in-One Exam Guide (Exams 100-490 & 200-301) 1st Edition,”, 2021.Andrew S. Tanenbaum. Computer Networks 5th By Andrew S. Tanenbaum (International Economy Edition) by Andrew S. Tanenbaum David J. Wetherall (2011-01-09). **Additional:** Networking Essentials Lab Manual, Cisco Networking Academy, 2021James Kuros, Keith Ross. Computer Networking: A Top-Down Approach Hardcover – Student Edition, 2016. **Resources**  **-** Software and internet resources: Packet tracer, CISCO CCNA course  **Online availability**: additional study materials, homework assignments and projects can be found in EMCD at univer.kaznu.kz. | | | | | | | | |
| Academic policy of the course in the context of university moral and ethical values | **Rules of academic behavior:**  1. You should prepare for each class in advance according to the schedule below. The task must be completed before the class in which the topic is discussed.  2. Academic values:  1. Laboratory classes and CCF shall be performed on their own  2. Plagiarism, forgery of documents, the use of cheats, writing off at all stages of knowledge control are unacceptable.  Students with disabilities can receive counseling via e-mail - [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com) | | | | | | | | |
| Evaluation and attestation policy | **Criteria-based evaluation**: evaluation of training results by descriptors (verification of competencies formation on intermediate control and exams).  **Summative evaluation:** evaluation of activity in lessons, evaluation of completed task. | | | | | | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topic name** | **Number of hours** | **Max.**  **score \* \* \*** |
| 1 | **L1.** Introduction to Networking | 1 | 0 |
| **Lab 1**. The IOS Operating System | 2 | 5 |
| 2 | **L2.** Transport layer | 1 | 0 |
| **Lab 2.** Cisco IOS devices | 2 | 5 |
| **ISWT1.**  Consultation on implementation of ISW1 | 1 | 5 |
| 3 | **L3.** Networking layer | 1 | 0 |
| **Lab 3**. The life of a packet | 2 | 7 |
| **ISW1.** Building the advanced network topology and configuring IP addresses | 0 | 20 |
| 4 | **L4.** IP addressing | 1 | 0 |
| **Lab 4**. The cisco troubleshooting methodology | 2 | 7 |
| 5 | **L5.** Class addresses | 1 | 0 |
| **Lab 5.** Cisco router and switch basics | 2 | 7 |
| **ISWT2.**  Test. | 1 | 20 |
| 6 | **L6.** Classless addresses | 1 | 0 |
| **Lab 6.** Cisco device management | 2 | 7 |
| 7 | **L7.** Data layer and physical layer | 1 | 0 |
| **Lab 7.** Routing fundamentals | 2 | 12 |
| **ISWT3.**  Consultation on implementation of ISW2. | 1 | 5 |
| **BC1** |  |  | 100 |
| 8 | **L8.** Network devices | 1 | 0 |
| **Lab 8**. Dynamic routing protocols | 2 | 5 |
| **ISW 2.**  Building the advanced network topology and static routing | 0 | 10 |
| 9 | **L9.** Network troubleshooting | 1 | 0 |
| **LW9.** Interior gateway protocol (IGP). Fundamental configuration | 2 | 5 |
| 10 | **L10.** Device management | 1 | 0 |
| **Lab 10.** OSPF configuration | 2 | 5 |
| **ISWT4.** Test | 1 | 10 |
| 11 | **L11.** Routing fundamentals | 1 | 0 |
| 11 | **Lab 11.** VLAN and Inter-VLAN routing configuration | 2 | 5 |
| 12 | **L12.** Routing distances | 1 | 0 |
| **Lab 12.** DHCP configuration | 2 | 5 |
| **IWST 5.** Consultation on the implementation of IWS 3. | 1 | 5 |
| 13 | **L13.** DHCP configuration | 1 | 0 |
| **Lab 13.** ACL configuration | 2 | 5 |
| **ISW 3.**  Building the advanced network topology and dynamic routing | 0 | 10 |
| 14 | **L14.** Access control lists | 1 | 0 |
| **Lab 14.** NAT configuration | 1 | 10 |
| **IWST 6.** Test | 1 | 10 |
| 15 | **L15.** NAT | 1 | 0 |
| **LW15.** IPv6 configuration | 2 | 10 |
| **ISWT6. Consultation on preparation for examination questions** | 1 | 5 |
| **BC 2** |  |  | **100** |

**Dean \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Urmashev B.A.**

**Head of the Department of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mussiraliyeva Sh. Zh.**

**Lecturer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Karyukin V.I.**