**Syllabus**

**Spring semester 2021-2022**

**On the educational program «6B06102 – Network administration»**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Code of the discipline | | Name of the discipline | ISW | A number of hours in a week | | | | | A number of credits | | ISWT |
| Lecture | | Practice | Laboratory | |
| AS 3220 | | Network administration | 6 | 15 | |  | 30 | | 3 | | 7 |
| Academic information about the course | | | | | | | | | | | |
| Type of studying | | Type of the course | Type of the lecture | | Type of the practice | | | The number of ISW | | Type of the final control | |
| Offline / Online | | Theoretical, practical | Problem-oriented | | Learning the theories of networking and configuring network devices | | | 7 | | Written exam | |
| Lecturer | | Karyukin Vladislav Igorevich | | | | | | Office hour | | According to the schedule | |
| e-mail | | [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com), [vladislav.karyukin@kaznu.kz](mailto:vladislav.karyukin@kaznu.kz) | | | | | |
| Phone number | | +77479574800 | | | | | |  | |  | |
| Laboratory work | | Karyukin Vladislav Igorevich | | | | | |  | |  | |
| e-mail | | [vladislav.karyukin@gmail.com](mailto:vladislav.karyukin@gmail.com), [vladislav.karyukin@kaznu.kz](mailto:vladislav.karyukin@kaznu.kz) | | | | | | Office hour | | According to the schedule | |
| Phone | | +77019405992 | | | | | |  | |
| Academic presentation of the course | | | | | | | | | | | |
| The purpose of the course | **Expected results of studying (RS)** | | | | Indicators of achieving RS (for each RS at least two indicators) | | | | | | |
| This course aims to study the concepts of Python programming language and understand their practical implementation by solving real-life practical problems of varying complexity.  This course aims at developing the understanding of the networking, Cisco devices’ configuration and troubleshooting and | **RS1** (cognitive) Know theoretical and methodological concepts of networking | | | | * 1. – the ability to build configure network topologies   2. – knowing the features and specifications of all seven layers of the OSI model | | | | | | |
| **RS2** (functional) Apply knowledge of working with CISCO network devices | | | | 2.1 – configuring switches and routers 2.2 – developing complex topologies | | | | | | |
| **RS3** (functional) Development of the routing configurations | | | | 3.1 – be able to configure the communication between network devices and hosts in different networks  3.2 – configuring static and dynamic routes | | | | | | |
| **RS 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 and postrequisites | **Prerequisites:** Information and communication technologies  **Postrequisites:** Cloud technologies | | | | | | | | | | |
| Literature | **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,”Andrew S. Tanenbaum. Computer Networks 5th By Andrew S. Tanenbaum (International Economy Edition) by Andrew S. Tanenbaum David J. Wetherall(2010-01-09). **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 conduct**: 1. For each classroom session, you should prepare in advance according to the schedule below. The preparation of the assignment should be completed before the classroom session where the topic is discussed. 2. Academic values: 1. IWS laboratory exercises should be independent, creative. 2. Plagiarism, forgery, the use of cheat sheets, cheating at all stages of knowledge control are inadmissible Students with disabilities can receive consulting assistance by email - vladislav.karyukin@gmail.com | | | | | | | | | | |
| Evaluation policy | **Criteria evaluation**: assessment of learning outcomes in relation to descriptors (checking the formation of competencies at midterm control and exams). **Summative evaluation**: assessment of the activity of work in the classroom; assessment of the completed assignment. | | | | | | | | | | |

**Academic calendar and the content of the course**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Week | A name of the topic | RS | ID | A number of hours | Maximum points | Knowledge evaluation form | A form of classes / platform |
| 1 | **L1.** Introduction to Networking | RS1 | ID 1.1. | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 1 | **LW1**. The IOS Operating System | RS1 | ID 1.1 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 2 | **L2.** Transport layer | RS1 | ID 1.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 2 | **LW2.** Cisco IOS devices | RS1 | ID 1.1 | 2 | 10 | A report in Word file | Classroom, webinar in MS Teams |
| 3 | **L3.** Networking layer | RS1 | ID 1.2 | 1 | 0 |  | Classroom, video lecture in MS Teams |
| 3 | **LW3**. The life of a packet | RS1 | ID 1.2 | 1 | 10 | A report in Word file | Offline |
| 3 | **ISWT1.** Building the advanced network topology and configuring IP addresses |  |  |  | 0 |  | Offline |
| 3 | **ISW1.** Implementation of project of building network topologies and configuring IP addresses | RS1 | ID 1.1 |  | 25 |  | Offline |
| 4 | **L4.** IP addressing | RS1 | ID 1.1 | 1 | 0 |  | Offline |
| 4 | **LW4**. The cisco troubleshooting methodology | RS1 | ID 1.1  ID 1.2 | 2 | 10 | A report in Word file | Offline |
| 5 | **L5.** Class addresses | RS1 | ID 1.1 | 1 | 0 |  | Offline |
| 5 | **LW5.** Cisco router and switch basics | RS1  RS3 | ID 1.1  ID 3.1  ID 3.2 | 2 | 10 | A report in Word file | Offline |
| 5 | **ISWT2.** Consultation on doing ISW 2 |  |  |  | 0 |  | Offline |
| 5 | **ISW 2.** Building the advanced network topology and configuring VLANs | RS2 | ID 2.1  ID 2.2 |  | 25 | A report in Word file | Offline |
| 5 | **BC 1** |  |  |  | 100 |  |  |
| 6 | **L6.** Classless addresses | RS1 | ID 1.1  ID 1.2 | 1 | 0 |  | Offline |
| 6 | **LW6.** Cisco device management | RS1 | ID 1.1 | 2 | 10 | A report in Word file | Offline |
| 7 | **L7.** Data layer and physical layer | RS1 | ID 1.1 | 1 | 0 |  | Offline |
| 7 | **LW7.** Routing fundamentals | RS1 | ID 1.1  ID 1.2 | 1 | 10 |  | Offline |
| 7 | **ISWT 3.** Consultation on doing ISW3 |  |  |  | 0 |  | Offline |
| 7 | **ISW 3.** Building the advanced network topology and configuring static and dynamic routing | RS2  RS3 | ID 2.1  ID 2.2  ID 3.1 |  | 25 | A report in Word file | Offline |
| 8 | **L8.** Network devices | RS1 | ID 1.1 | 1 | 0 |  | Offline |
| 8 | **LW8**. Dynamic routing protocols | RS1 | ID 1.1 | 2 | 10 | A report in Word file | Offline |
| 9 | **L9.** Network troubleshooting | RS1  RS2 | ID 1.1  ID 2.2 | 1 | 0 |  | Offline |
| 9 | **LW9.** Interior gateway protocol (IGP) Fundamentals configuration | RS1 | ID 1.2 | 2 | 10 | A report in Word file | Offline |
| 9 | **ISWT 4.** Consultation on doing ISW 4 |  |  |  | 0 |  | Offline |
| 9 | **ISW 4.** Building the advanced network topology and configuring DHCP | RS1  RS3  RS4 | ID 1.2  ID 3.2  ID 4.2 |  | 25 | A report in Word file | Offline |
| 10 | **L10.** Device management | RS1  RS2 | ID 1.1  ID 2.1  ID 2.2 | 1 | 0 |  | Offline |
| 10 | **LW10.** OSPF configuration | RS3 | ID 3.1  ID 3.2 | 2 | 10 | A report in Word file | Offline |
| 10 | **МТ (Midterm Exam)** |  |  |  | 100 |  | Offline |
| 11 | **L11.** Routing fundamentals | RS1 | ID 1.2 | 1 | 0 |  | Offline |
| 11 | **LW11.** VLAN and Inter-VLAN routing configuration | RS3 | ID 3.1  ID 3.2 | 2 | 10 | A report in Word file | Offline |
| 11 | **ISWT 5.** Consultation on doing ISW 5 |  |  |  |  |  | Offline |
| 11 | **ISW 5.** Building the advanced network topology and configuring ACLs | RS4 | ID 4.2 |  | 20 | A report in Word file | Offline |
| 12 | **L12.** Routing distances | RS3 | ID 3.1  ID 3.2 | 1 | 0 |  | Offline |
| 12 | **LW12.** DHCP configuration | RS4 | ID 4.2 | 2 | 10 | A report in Word file | Offline |
| 13 | **L13.** DHCP configuration | RS4 | ID 4.2 | 1 | 0 |  | Offline |
| 13 | **LW13.** ACL configuration | RS4 | ID 4.1 | 2 | 10 | A report in Word file | Offline |
| 13 | **ISWT 6.** Consultation on doing ISW 5 |  |  |  | 0 |  | Offline |
| 13 | **ISW 6.** Building the advanced network topology and configuring NAT | RS 4 | ID 4.1 |  | 20 | A report in Word file | Offline |
| 14 | **L14.** Access control lists | RS4 | ID 4.1 | 1 | 0 |  | Offline |
| 14 | **LW14.** NAT configuration | RS4 | ID 4.2 | 1 | 10 | A report in Word file | Offline |
| 15 | **L15.** NAT | RS4 | ID 4.1  ID 4.2 | 1 | 0 |  | Offline |
| 15 | **LW15.** IPv6 configuration | RS2 | ID 2.1  ID 2.2 | 1 | 10 | A report in Word file | Offline |
| 15 | **ISWT 7.** Consultation on ISW 6 |  |  |  | 0 |  | Offline |
| 15 | **ISW 7.** Building the advanced network topology and configuring Wireless connectivity | RS2  RS4 | ID 2.1  ID 2.2  ID 4.1  ID 4.2 |  | 10 | A report in Word file | Offline |
|  | **BC 2** |  |  |  | 100 |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Evaluation and certification policy | Criteria-based assessment: assessment of learning outcomes in accordance with the descriptors (assessed through interdisciplinary observations and examinations).  Summative assessment: assessment of classroom activity (webinar); evaluation 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).  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 | |

A chairman of the methodological counsil Gusmanova F.R.

A head of department Mussiraliyeva Sh.Zh.

Lecturer Karyukin V.I.