**SYLLABUS**

**Fall semester 2021-2022 academic years**

**on the educational program “7M05114-Virology”**

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| **Discipline’s code** | **Discipline’s title** | **Independent work of students (IWS)** | **No. of hours per week** | **Number of credits** | **Independent work of student with teacher (IWST)** |
| **Lectures (L)** | **Practical training (PT)** | **Laboratory (Lab)** |
| **SMVIV5207** | Special methods for the isolation and study of viruses | 98 |  | 30 | 0 | 5 |  |
| **Academic course information** |
| **Form of education** | **Type of course**  | **Types of lectures** | **Types of practical training**  | **Number of IWS** | **Form of final control** |
| Online/combined | Elective  | Module technologyProblem lecture | analysis |  | Orally examination, assignments |
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| **Academic presentation of the course**  |

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| **Aim of course**  | **Expected Learning Outcomes (LO)**As a result of studying the discipline the graduate will be able to: | **Indicators of LO achievement (ID)**(for each LO at least 2 indicators) |
| **Primary object of this course is to provide students****with just enough basic virology allows them to deal with specific groups of human viruses, diagnosis of****viral infections, control measures including immunization and anti-viral therapies. Commonly used virology techniques will be described: cell culture****technique, detection, isolation and identification of different human viruses by serological and molecular****techniques.**  | 1. Describe general virus life cycle | 1.1 Knowledge of the features of general viral structure, genome, and life cycle |
| 1.2 Fundamental differences between each virus families |
| 2. Predict replication strategy of viruses based on genome composition | 2.1 Knowledge to determine RNA viruses from DNA viruses  |
| 2.2 Skills in determining the virus replication and gene expression strategies |
| 3. Apply concepts of virus structure to replication cycle | 3.1 Basic knowledge about the main stages of replication cycle |
| 3.2 Ability to determine viruses with respect to structure, replication and gene expression strategies and infectivity |
| 4. Compare possibilities and limits of methods and techniques used in virology diagnosis and reference | 4.1 Evaluate different control measures of viral diseases  |
| 4.2 Knowledge of methods and techniques used in virus diagnosis and reference |
| 5. Apply the acquired knowledge, skills and competencies in research activities | 5.1 Professional competence of a research scientist in the field of "Special methods for the isolation and study of viruses " |
| 5.2 Ability as a research scientist in the field of "Special methods for the isolation and study of viruses " |
| **Prerequisites** | Microbiology  |
| **Post requisites** | Dissertation for master degree |
| **Information resources**  | Base literary sources: 1. 1. Flint, S.J., Enquist, L.W., Krung, R. Racaniello, VR. And Skalka, A.M. Principles of Virology, Molecular Biology, pathogenesis and control, ASM Press, Washinton D.C.
2. 2. Collier, L., Kellam, P., and Oxford J. (2011). Human Virology. Fourth Edition. Oxford University Press, U.K
3. 3. Virology Methods Manual. Brian W.J. Mahy (Editor), Hillar O. Kangro (Editor). Elsevier Science & Technology Books

4. Methods and Techniques in Virology. Pierre Payment, Trudel (Editor). Publisher: Marcel Dekker 5. Journals: Journal of Medical; Virology Journal of Clinical Virology; Journal of Virology; Journal of General Virology  |

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| **Academic policy of the course in the context of university moral and ethical values** | **Academic Behavior Rules:** All students have to register at the MOOC. The deadlines for completing the modules of the online course must be strictly observed in accordance with the discipline study schedule. ATTENTION! Non-compliance with deadlines leads to loss of points! The deadline of each task is indicated in the calendar (schedule) of implementation of the content of the curriculum, as well as in the MOOC.**Academic values:**- Practical trainings/laboratories, IWS should be independent, creative.- Plagiarism, forgery, cheating at all stages of control are unacceptable.- Students with disabilities can receive counseling at e-mail: aiymmun2013@gmail.comCompulsory attendance in the classroom, the impermissibility of late attendance. Without advance notice of absence and undue tardiness to the teacher is estimated at 0 points. Submission of assignments (Independent work of students, midterm control, laboratory tasks, projects and etc.) prior to the deadlines. The violation of submission deadlines leads to the deduction of penalty points.* Appropriate timing of homework or projects may be extended in the event of extenuating circumstances (such as illness, emergencies, emergency, contingency, etc.) in accordance with the University's academic policies. Student participation in discussions and exercises in the classroom will be taken into account in its overall assessment of the discipline. Design issues, dialogue and feedback on the subject matter of discipline are welcomed and encouraged in the classroom, and the teacher in the derivation of the final grade will take into account the participation of each student in the class.

Academic values:Academic honesty and integrity: independent performance of assignments; inadmissibility of plagiarism, forgery, cheating at all stages of the knowledge control, and disrespectful attitude towards teachers. (The code of KazNU Student’s honor)1. Each classroom work you have to prepare in advance, according to the schedule below. Theoretical preparation for classes must be completed before the classroom. Letting practical tasks based on the passed new material must pass to the next class after the passage of the new material.2. Home work will be distributed throughout the semester, as shown in the graph of discipline.3. Homework includes the amount of material that you have listened and passed on almost seminars. Search IWS appropriate learning resources may be required to study the language necessary inquiries.4. All individual tasks IWS in the case of coincidence of the responses - reducing the assessment to be both students.5. In all seminars during the semester assignments and individual assignments for PWS must give up strictly according to plan, syllabus, no postponing deadlines for the delivery of jobs there.When homework subject to the following rules:• Аssignments IWS should be performed within a specified time. Later homework will not be accepted.• Homework should be done on one side of a sheet of A4 paper, and pages should be secured by the order of the questions. Questions must be numbered, and definitive answers (if necessary) must be provided. (Homework, do not meet these standards will be returned with an unsatisfactory evaluation).You do not have to take all the jobs in the computer version, simply write it by hand; you do not need to enter it in the computer. |
| **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.$$Final evalution=\frac{RK1+MT+RK2}{3} x 0,6+0,4 x Exam$$Evalution:95% - 100%: А 90% - 94%: А-85% - 89%: В+ 80% - 84%: В 75% - 79%: В-70% - 74%: С+ 65% - 69%: С 60% - 64%: С-55% - 59%: D+ 50% - 54%: D- 0% -49%: F |

**CALENDAR (SCHEDULE) THE IMPLEMENTATION OF THE COURSE CONTENT:**

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| weeks  | Topic name | LO | ID | amount of hours  | Maximum score | Form of Knowledge Assessment  | TheForm of the lesson / platform |

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| Module **1**  |
| 1 | **PT 1** Architecture of viruses: basic components of viruses, virus genomes | LО 1 | ID 1.1. | 2 | 10 | Analysis | Webinarin MS Teams |
| 2 | **PT 2** Enveloped and non-enveloped viruses, Structural proteins – envelope proteins, matrix proteins and lipoproteins | LО 2 | ID 2.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 3 | **PT 3** Types of nucleic acid DNA (double stranded and single-stranded), RNA (double stranded, single stranded – positive sense and negative sense) | LО 2 | ID 2.1. | 2 | 10 | Analysis | Webinarin MS Teams |
| **Module П** |
| 4 | **PT 4** Disease caused by viruses | LО 3 | ID 3.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 5 | **PT 5** Specific Viral Infections General properties of human viruses | LО 3 | ID 3.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| **5** | **RC 1** | **LО 1** | **ID 1.1.** |  | **50(100)** |  |  |
| 6 | **PT 6** Study of the methods of viral isolation. Cultivation and Diagnostic methods of Viruses: General methods for isolation, identification, characterization and cultivation (embryonated eggs, experimental animals, and cell cultures) | LО 3 | ID 3.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 7 | **PT7** Pathogenesis of viruses, mode of transmission | LО 5 | ID 5.1. | 2 | 10 | Analysis | Webinarin MS Teams |
| 8 | **PT 8** Types of infection, clinical features of infections, epidemiology. Immune response to infections, treatment, prevention & control and laboratory diagnosis. | LО 1 | ID 1.1. | 2 | 10 | Analysis | Webinarin MS Teams |
| 9 | **PT 9** Direct methods of detection – light microscopy (inclusion bodies), electron microscopy and fluorescence microscopy. Serological methods - haemagglutination; complement fixation; | LО 3 | ID 3.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 10 | **PT 10** Immunofluorescence methods, ELISA and Radioimmunoassays, Western Bloting | LО 1 | ID 1.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| **10** | **МТ (Midterm Exam)** | **LО 1** | **ID 1.1.** |  | **50(100)** |  |  |
| 11 | **PT 11** Infectivity assay for animal and bacterial viruses - plaque method, LD50, ID50, IED50 | LО 1 | ID 1.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 12 | **PT 12** The laboratory diagnosis of viral infections | LО 1 | ID 1.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 13 | **PT 13** Virus isolation methods of the different types of virusesCoronaviruses and SARS. Hepatitis viruses | LО 1 | ID 1.2. | 2 | 10 | Analysis | Webinarin MS Teams |
| 14 | **PT 14** Virus isolation methods of the different types of virusesRetroviruses, Respiratory viruses. Retroviruses HIV, Respiratory viruses Influenza virus | LО 1 | ID 1.2. | 2 | 10 | Analysis | Webinarin MS Teams |
|  | **PT 15** Virus isolation methods of the different types of virusesHerpesviruses. Herpesviruses: alphaherpesviruses: herpes simplex and varicella betaherpesviruses: cytomegalovirus gammaherpesviruses: Epstein-Barr virus | LО 1 | ID 1.2. |  | 10 | Analysis | Webinarin MS Teams |
|  | **MT 2** | **LО 4** | **ID 4.1.** |  | **50(100)** |  |  |

[Abbreviations: QS - questions for self-examination; TK - typical tasks; IT - individual tasks; CW - control work; MT - midterm.

 Comments:

- Form of L and PT: webinar in MS Teams / Zoom (presentation of video materials for 10-15 minutes, then its discussion / consolidation in the form of a discussion / problem solving / ...)

- Form of carrying out the CW: webinar (at the end of the course, the students pass screenshots of the work to the monitor, he/she sends them to the teacher) / test in the Moodle DLS.

- All course materials (L, QS, TK, IT, etc.) see here (see Literature and Resources, p. 6).

- Tasks for the next week open after each deadline.

- CW assignments are given by the teacher at the beginning of the webinar.]

**Dean Zayadan B.K.**

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**Head of the Department Kystaubaeva A.S.**

**Lecturer**  **Abdimadiyeva A.E.**