Microbiology with the Basics of Immunology

1 Background information	
Name of faculty	Pharmacy
Educational program (industry, specialty, Higher education level of study	22 Healthcare, 226 Pharmacy, second (Master's) level of higher education, full-time
Academic Year	2021-2022
Discipline name, code (electronic identification at the Danylo *Halytskyi*	Microbiology with Basics of Immunology; OK 16 http://new.meduniv.lviv.ua/kafedry/kafedra- mikrobiologia/
Department (*name, address, phone,* e-mail)	Department of Microbiology 79005, Lviv, 12 Zelena street Phone: +38 (032) 276-28-36 Kaf_microbiology@meduniv.lviv.ua
Chair of the department *Contact Email)*	MD Prof. O.Korniychuk – o_korniychyk@ukr.net
Educational year (year of the discipline study)	II-III year
Semester the study of the discipline is realized)	IV, V semesters
Type of discipline / module *(mandatory / optional)*	Mandatory
Teaching staff *(names, surnames, scientific degrees and titles of teachers who teach Contact Email)*	Assoc. Prof. S,J. Pavliy, PhD – microvirus60@ukr.net
Erasmus yes / no (*availability of discipline for students in within the Erasmus + program*	No
The person responsible for the syllabus (*the person to whom comments should be provided in relation to the syllabus*	assoc. prof. Pavliy S. Ph.D. microvirus60@ukr.net

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N/o. of credits in ECTS	5,0 ECTS credits
Number of hours *(lectures / practical classes / self-education work of students*	*lectures* - 20 hours *practical class* - 60 hours Self-education work
Study language	English
Information on consultations	MISA system, according to the schedule of consultations set out on the website, information stands of the department
Address, telephone and regulations of the clinical base, as needed	-

2 Short annotation to the course

The subject of study of the discipline is the properties of pathogenic representatives of the world of microbes, their interaction with the human body, the mechanisms of development of infectious diseases, methods of their diagnosis, specific prevention and treatment.

The study of phytopathogenic microorganisms makes it possible to correctly diagnose diseases of medicinal plants and the impact of microbes on plant raw materials for the manufacture of pharmaceuticals. At the present stage, biotechnological processes using microorganisms are widely used to obtain biologically active substances and drugs. Therefore, in the course of microbiology, students learn the basics of microbial and biotechnological and genetic engineering technologies.

3. Objective and tasks of the discipline

- The purpose of studying the discipline "Microbiology, Virology and Immunology" - training a specialist capable of solving complex problems and problems of microbiological diagnosis, etiotropic treatment and specific prevention of diseases caused by microorganisms, both in the learning process and in the professional activity of the doctor

Microbiology, virology and immunology are the basis for the study of epidemiology, infectious diseases, clinical immunology and allergology, pharmacology, general hygiene, internal medicine, surgery and pediatrics and other clinical disciplines, which integrates teaching with these disciplines and application of knowledge in microbiology, virology and immunology in the process of further study and in professional activities. The study is directly based on the following disciplines: medical biology, medical and biological physics, general biology, botany, biological chemistry, bioorganic chemistry, physiology.

Learning Objectives:

- Interpret the biological properties of pathogenic and non-pathogenic microorganisms, viruses and patterns of their interaction with the macroorganism, human population and the environment.
- To determine methods of microbiological and virological diagnostics, etiotropic therapy and specific prevention of infectious diseases.
- To interpret the main mechanisms of formation of the immune response of the human body.
- To determine methods of immunotherapy and immunoprophylaxis of infectious diseases.
- Interpret the results of microbiological studies of drugs in pharmacy and pharmaceutical companies.

Competences and learning outcomes, the formation of which provides the study of the discipline (general and special competencies).

The discipline provides students with the acquisition of competence: ability to solve typical and complex specialized problems and practical problems in professional activities in the field of health care, or in the learning process, which involves microbiological research and / or innovation and is characterized by complexity and uncertainty of conditions and requirements

- *Common Competences*:

CC 1. Ability to act socially responsible and civic conscious.
CC 2. Ability to apply knowledge in practical situations.
CC 3. Striving to preservation of the environment.
CC 4. Ability to abstract thinking, analysis and synthesis, to learn and be modernly trained.
CC 6. Knowledge and understanding of the subject area and understanding of professional activity.
CC 8. Ability to communicate in the state language both orally and in writing, ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.
CC 9. Skills in the use of information and communication technologies.
CC 11. Ability to evaluate and ensure the quality of work performed

CC 12. Ability to conduct research at the appropriate level.
CC 13. Ability to exercise their rights and responsibilities as a member of society, to be aware of the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine. places in the general system of knowledge about nature and society and in the development of society, equipment and technologies, to use different types and forms of physical activity for active recreation and healthy living
CC 14. Ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies. forms of physical activity for active recreation and a healthy lifestyle
Professional competencies (PC)
PC 1. The ability to conduct health education among the population to prevent common diseases, prevent dangerous infectious, viral and parasitic diseases, and also in order to facilitate the timely detection and maintenance of adherence to the treatment of these diseases in accordance with their medical and biological characteristics and microbiological characteristics.
PC 20. Ability to develop methods for quality control of medicines, including active pharmaceutical ingredients, medicinal plant raw materials and excipients using physical, chemical, physicochemical, biological, microbiological, pharmacotechnological and pharmacoorganoleptic control methods.

4. Prerequisites of the discipline

To successfully study and master the competencies in this discipline requires basic knowledge obtained by students in the study of medical biology, medical and biological physics, general biology, botany, biological chemistry, bioorganic chemistry, physiology.

5. Program Learning Outcomes

Description of learning outcomes

Learning outcome code	The content of the learning outcome	Link to the matrix code competences
The code is created when filling the syllabus (category: Kn-knowledge, Ab-ability, C-competence, AU - autonomy and Responsability	*Learning outcomes determine that the student must know, understand and be able to perform, after completing the discipline. Learning outcomes follow from the set learning goals. It is necessary to enroll in the discipline to confirm the achievement of each learning outcome.*	Symbol of the Program Learning Outcome Code in the Higher Education Standard **OK 16**
Kn-1	Have specialized conceptual knowledge acquired in the learning process.	*PR 2*
Kn-2	Have specialized knowledge about the person, his organs and systems, know the standard methods of laboratory and instrumental research. Serological reactions in infectious diseases; Rapid tests for viral diseases; Amplification methods for infectious diseases; Serological reactions in autoimmune diseases; Chemical and bacteriological studies of biological fluids and secretions).	*PR 2*
Kn-3	Know the principles and systems of planning preventive and anti-epidemic measures for infectious diseases in typical conditions and in	*PR 13*

	conditions of epidemic distress based on the results of the analysis, the survey data of the center of infectious diseases. Know the preventive and anti-epidemic methods of organizing measures to prevent the spread of infectious diseases.	
Kn-4	Know the principles of organizing and conducting a system of preventive and anti-epidemic measures for infectious diseases and preventing their spread in typical conditions and during the exacerbation of the epidemic situation. Know the methods of detection and early diagnosis of infectious diseases, the organization of primary anti-epidemic measures in the center of infectious diseases.	*PR 13*
Kn-5	Know standard methods, including modern computer information technology, processing of state, social and medical information.	*PR12*
Kn-6	Know the socio-economic and biological determinants that affect public health; types and methods of prevention to prevent the negative impact of socio-economic factors on the health of the population and its individual groups	*PR13, PR19*
Kn-7	Know the worldview function of bioethics in the formation of civil society and historical aspects of the concept of "human rights"	*PR2*
Kn-8	Know the Law of Ukraine "On Counteracting the Spread of Diseases Caused by Human Immunodeficiency Virus (HIV), Legal and Social Protection of People Living with HIV". On Amendments to Selected Legislative Acts of Ukraine to Prevent the Emergence and Spread of Coronavirus Disease (COVID-19)	*PR13*
Ab-1	Be able to solve complex problems and problems that arise in professional activities.	*PR4*
Ab-2	Be able to analyze the results of laboratory and instrumental studies and on their basis to evaluate information about the patient's diagnosis	*PR12*
Ab-3	Be able to plan (make plans) measures to prevent the spread of infectious diseases on the basis of epidemiological analysis, using preventive and anti-epidemic methods.	*PR13*
Ab-4	Be able to organize preventive and anti-epidemic measures for infectious diseases in health care facilities, among the population and in the centers of infectious diseases on the basis of epidemiological analysis by risk groups, risk areas, time and risk factors.	*PR13*
Ab-5	Ability to determine the source of the required information depending on its type; ability to conduct statistical processing of material and analysis of information obtained	*PR2, PR4*
Ab-6	Be able to calculate on the basis of epidemiological and medical-statistical research indicators of public	*PR13*

	health Be able to assess the relationship and impact of socio-economic and biological factors on the health of the individual, family, health population Be able to plan preventive measures to prevent the negative impact of socio-economic factors on the health of the population and its individual groups	
Ab-7	Be able to detect potential threats to the nature of living organisms	*PR13, PR19*
Ab-8	Take into account the diversity of human and civil rights	*PR2*
C-1	The ability to use knowledge in practice	*PR2*
C-2	Evaluation of laboratory and instrumental research results studies	*PR12*
C-3	Planning and conducting of preventive and anti-epidemic measures for infectious diseases	*PR13*
C-4	Planning and conducting of preventive and anti-epidemic measures for infectious diseases	*PR13*
C-5	Ability to process state, social, economic and medical information.	*PR12*
C-6	Evaluation of the impact of socio-economic and biological determinants on the health of the individual, family, population	*PR13*
C-7	Ability to apply intellectual abilities and knowledge when working with the patient.	*PR8*
C-8	Ability to provide medical, ethical and legal assessment of specific cases from the standpoint of confidentiality and medical secrecy in solving situational problems in patients with HIV.	*PR13*
AU-1	Responsible for making decisions in difficult conditions.	*PR13*
AU-2	Be responsible for deciding on the evaluation of laboratory and instrumental research results.	*PR12*
AU-3	To be responsible for the qualitative analysis of indicators of infectious morbidity of the population, timely carrying out of the corresponding preventive and anti-epidemic measures.	*PR13*
AU-4	To be responsible for the quality and timeliness of early diagnosis of infectious diseases, the organization of effective preventive and anti-epidemic measures to prevent the spread of infectious diseases.	*PR13*
AU-5	To be responsible for high-quality and timely execution of statistical processing and analysis of the received information	*PR8, PR12*
AU-6	Be able to plan preventive measures to prevent the negative impact of socio-economic factors on the health of the population and its individual groups	*PR13*
AU-7	Make effective decisions, including in extreme conditions, and be responsible for them.	*PR13*
AU-8	Be responsible for maintaining medical confidentiality.	*PR2*
6. Discipline format and scope		

Discipline format *(specify full-time or part-time)*	Full-time	
Sessions	Hours	Group Numbers
lectures	20	12
practical	60	12
Seminars	-	-
Self education work	70	12

7. Discipline content

Code type of lessons	Topic	Topic content	Result code training	Teacher
L-1 *(lecture-1)*	Subject and tasks of medical microbiology. Evolution and classification of microorganisms. Morphology and structure of bacteria.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	assoc. prof. Pavliy S.
L-2	Physiology of microorganisms.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	assoc. prof. Pavliy S.
L-3	Microbiological bases of aseptic and antiseptic. Chemotherapeutic drugs. The main groups of disinfectants. The main groups of disinfectants and the group of antiseptics for the prevention of COVID-19.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-3, Kn-6, Ab-3, C-1, C-4, C-5, AU-4*	assoc. prof. Pavliy S.
L-4	Theory of infections. Features of etiopathogenesis of coronavirus infection. Immunoprophylaxis and immunotherapy. Fundamentals of biotechnology and genetic engineering.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-3, Kn-5, Kn-6, Kn-7, Kn-8, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU-6, AU-7, AU-8*	assoc. prof. Pavliy S.
L-5	Biological features of	Presentation of lecture material using	*Kn-1, Kn-2, Kn-*	assoc. prof.

	viruses. Incubation Modern classification. Features of laboratory diagnosis of viral diseases. The main groups of antiviral drugs. COVID-19 caused by the coronavirus SARS-CoV-2	multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*3, Kn-4, Kn-5, Kn-6, Kn-7, Kn-8, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C2, C-3, C-4, C-5, C-6, C-7, C-8 AU-1, AU-2, AU-3, AU-4, AU-5, AU-6, AU-7, AU-8*	Pavliy S.
L-6	Pathogenic cocci.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	assoc. prof. Pavliy S.
L-7	Pathogenic enterobacteriaceae.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	assoc. prof. Pavliy S.
L-8	Pathogens of respiratory bacterial infections (diphtheria, tuberculosis).	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	assoc. prof. Pavliy S.
L-9	Pathogenic anaerobes.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	assoc. prof. Pavliy S.

L-10	Phytopathogenic microorganisms. Interpret the results of microbiological studies of drugs in pharmacy and pharmaceutical companies.	Presentation of lecture material using multimedia support. Outlining problematic issues. Providing answers to questions and solutions to problems.	*Kn-1, Kn-2, Kn-5, Ab-1, Ab-7, C-1, C-2, C-5, AU-1, AU-2, AU-7, AU-8*	assoc. prof. Pavliy S.
P-1 *(Practical class 1)*	Organization of bacteriological laboratory. Dyes and simple microorganisms staining methods. The main forms of bacteria, determining the size of microorganisms.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.
P - 2	Ultrastructure of a bacterial cell. Complex methods of staining Differential method of Gram staining. The Ziel-Nielsen method.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.
P - 3	Morphology and structure of bacteria. Morphology of spirokhet, actinomycetes, fungi and protozoa.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.

		protocol of lesson. 7.Finding out the problematic issues summing up the lesson.		
P - 4	Physiology of microorganisms. Nutrient media for the cultivation of microorganisms. Day 1 of isolation of pure culture of aerobic bacteria. Disinfection Sterilization.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.
P - 5	Bacteriological method of research. Isolation of pure culture of aerobes (Day 2). Cultural properties of microorganisms.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.
P - 6	Isolation of pure culture of aerobes (Day III). Enzymes of bacteria. Isolation of pure cultures of bacteria.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.

		lesson.		
P - 7	Identification of pure cultures of bacteria. Genetics of bacteria.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	Assoc. prof Pavliy S.
P - 8	The role of microorganisms in the infectious process. Virulence factors. Microorganism toxins. Experimental method of microbiological diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-5, Kn-6, Kn-7, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-5, C-6, AU-2, AU-3, AU-4, AU-5*	Assoc. prof Pavliy S. .
P - 9	Factors of nonspecific resistance of the body. Immune System. Immune status assessment.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-5, Kn-6, Kn-7, Ab-8 C-1, C-5, C-6, C-7, AU-2, AU-5, AU-8*	Assoc. prof Pavliy S.
P -	Serological reactions in microbiology (AT, IHT,	1. Checking the mastering of the list	*Kn-1, Kn-2, Kn-5, Ab-2, Ab-5,*	Assoc. prof Pavliy S.

10	PT).	of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*C-1, C-2, C-5, AU-2, AU-3, AU-4, AU-5, AU-8*	
P-11	Serological reactions (Pt-2) CFT, ELISA, RIF	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-5, Ab-2, Ab-5, C-1, C-2, C-5, AU-2, AU-3, AU-4, AU-5, AU-8*	Assoc. prof Pavliy S.
P-12	Vaccines and antiserum.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-5, Kn-6, Kn-7, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-3, C-4, C-5, C-6, C-7, AU-1, AU-3, AU-4, AU-5, AU-6, AU-7, AU-8*	Assoc. prof Pavliy S.
P-13	Antagonism of microbes. Chemotherapeutic drugs. Determination of bacterial sensitivity to antibiotics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control.	*Kn-1, Kn-2, Kn-5, Ab-2, C-1, C-2, C-5, AU-2, AU-4, AU-5,*	Assoc. prof Pavliy S.

		3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.		
P - 1 4	Biological features of viruses. Incubation Virological characteristics of the pathogen COVID-19.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-4, Kn-5, Kn-6, Kn-8, Ab-2, Ab-5, Ab-7, C-1, C-2, C-5, C-6, C-8, AU-2, AU-4, AU-5*	Assoc. prof Pavliy S.
P - 1 5	Indication of viral reproduction. Identification of viruses.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-4, Kn-5, Kn-6, Kn-8, Ab-2, Ab-5, Ab-7, C-1, C-2, C-5, C-6, C-8, AU-2, AU-4, AU-5*	Assoc. prof Pavliy S.
P - 1 6	Orthomyxoviruses. Virological diagnosis. Drugs for specific prevention. Etiotropic treatment.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ум-1, Ум-2, Ум-3, Ум-4, Ум-5, Ум-6, Ум-7, Ум-8, К-1, К-2, К-3, К-4, К-5, К-6, К-7, АВ-1, АВ-2, АВ-*	Assoc. prof Pavliy S. .

		level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7.Finding out the problematic issues summing up the lesson.	*3, AB-4, AB-5, AB-6, AB-7, AB-8*	
П - 17	Пікорнавіруси. Virological diagnosis. Drugs for specific prevention. COVID-19 caused by the coronavirus SARS-CoV-2	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7,* *Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8* *C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 18	Causes of viral hepatitis. Virological diagnosis. Drugs for specific prevention.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7,* *Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8* *C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 19	DNA-genome viruses. Herpes and adenoviruses. Virological diagnosis. medicines for HIV treatment	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7,* *Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8* *C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.

		protocol of lesson. 7.Finding out the problematic issues summing up the lesson.		
P - 2 0	Retroviruses. HIV. Virological diagnosis of HIV	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Kn-8, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C2, C-3, C-4, C-5, C-6, C-7, C-8 AU-1, AU-2, AU-3, AU-4, AU-5, AU-6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 2 1	Pathogenic cocci. Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 2 2	General characteristics of pathogens of intestinal infections: escheryhia, salmonella, shigels. Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.

		lesson.		
P - 2 3	Pathogens of respiratory bacterial infections (diphtheria, tuberculosis). Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 2 4	Pathogens of especially dangerous infections (cholera, plague, anthrax). Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P - 2 5	Pathogenic anaerobes. Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P -	Pathogenic spirochetes, Borealis, leptospira.	1. Checking the mastering of the list	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6,*	Assoc. prof Pavliy S.

26	Microbiological diagnostics Drugs for prevention, treatment and diagnostics.	of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
P-27	Clinical microbiology. Hospital infections. The problem of COVID-19 is like a hospital infection.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	Assoc. prof Pavliy S.
P-28	Microflora of the external environment (water, air, soil). Microbiota of the human body. Dysbiosis and drugs for its correction.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control. 3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.	*Kn-1, Kn-2, Kn-5, Kn-6, Kn-7, Ab-2, Ab-6, C-1, C-2, C-5, C-6, C-7, AU-2, AU-5, AU-6 AU-8*	Assoc. prof Pavliy S.
P-29	Microflora pharmacies, plant medicinal raw materials, ready dosage forms.	1. Checking the mastering of the list of questions from the lesson plan. 2. Discussion of issues for self-control.	*Kn-1, Kn-5, Ab-1, Ab-5, Ab-7, C-1, C-2, C-5, AU-2, AU-5,*	Assoc. prof Pavliy S.

		3. Solving test tasks. 4. Solving situational tasks. 5. Determining the level of formation of a particular skill or ability. 6. Registration of the protocol of lesson. 7. Finding out the problematic issues summing up the lesson.		
SEW-1 *(self Educ ation work*	Stages of microbiology development. Modern ideas about the evolution of the world of microbes. Tasks and prospects of modern microbiology development.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, Ab-5 C-1*	Assoc. prof Pavliy S.
SEW-2	Types of microscopes. Methods of microscopy.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, C-1*	
SEW-3	Metabolism of bacteria. Protein, hydrocarbon, lipid and mineral metabolism. Practical use of enzyal properties of bacteria.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	
SEW-4	Organization of the genetic material of the bacterial cell; bacterial chromosomes, plasmids, migrating elements	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	
SEW-5	Modification variability, its mechanisms and forms of manifestation in bacteria. Genetic variability. mutations and recombination. Dissealization.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, Ab-5, Ab-7, C-1, C-2, AU-5*	
SEW-6	Antigens as immune response inductors. Antigenic structure of microorganisms.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-5, Ab-7, C-2*	
SEW-7	Antibodies as a product of humoral response. Classes of immunoglobulins, their structure, properties. The concept of monoclonal antibodies. Immunobiological medications.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-5, Kn-7, Ab-1, Ab-2, C-1, C-2, C-5,*	
SEW-8	Express diagnosis of infectious diseases (RIA, PCR, immunobloting).	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-5, Ab-2, Ab-5, C-1, C-2, C-5, AU-2, AU-3, AU-*	

			4, AU-5, AU-8	
SEW-9	Practical use of bacteriophages in microbiology and medicine.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-4, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6 C-1, C-2, C-3, C-4, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU-6, AU-7,*	
SEW-10	Paramyxoviruses. Measles virus. Parainfillus, mumps. Virological diagnostics, specific prevention. Human Coronaviruses (HCoVs) SARS-CoV, MERS-CoV, SARS-CoV-2.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-11	Arboviruses. The main families and representatives (togavirus, flaviviruses, bunyavirus, rabdovirus). Rabies virus. Virusological diagnostics, treatment, prevention. Tick-borne encephalitis virus. Virological diagnosis, specific and nonspecific prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-12	Popsvirus. Virusological diagnostics, treatment, prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-13	Papovavirus, parvovirus. Virusological diagnostics, treatment, prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5,*	

			AU -6, AU-7, AU-8	
SEW-14	Oncogenic viruses, viral oncogenesis Non-canonical viruses. Prions. Diseases that are caused by them.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-15	Biological properties of microorganisms that can potentially be used as bacteriological weapons. The main representatives.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-5, Kn-6, Kn-7, Ab-5, Ab-6, Ab-7, Ab-8, C-1, C-2, C-5, C-6,*	
SEW-16	Biosecurity in controlling infections is potentially dangerous as a bacteriological weapon.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Kn-7, Ab-1, Ab-2, Ab-3, Ab-4, Ab-5, Ab-6, Ab-7, Ab-8 C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-17	Conditionally pathogenic enterobacteria (proteus, klebsiela, citrobacter, enterobacter). Gram-negative non-fermenting bacteria (pygmy bacillus). Biological properties, values in pathology, features of microbiological diagnosis of diseases.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-18	Hemophilic bacteria. Brothels. Microbiological diagnostics Drugs for diagnosis, treatment and prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-19	Pathogens of petal infections (tularemia, brucelosis). Features of epidemiology. Laboratory	Processing the list of questions of the lesson. Preparation of answers to questions	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8,*	

	diagnostics. Drugs for specific prevention.	for self-control.	*C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-20	Pathogenic spirilles. The causative agent of fever from the bite of rats. Campylobacter are pathogens of acute intestinal diseases. Helicobacter pylori is the causative agent of human gastroduodenal diseases. Microbiological diagnostics Current treatments.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-21	Pathogenic mycoplasma. Role of heredity in human pathology. Laboratory diagnostics. medicines for HIV treatment	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-22	Pathogenic rickettsia. Pathogens of epidemic and endemic tiph rash. Pathogens of tick-borne spotted fevers, Q-fevers. Features of epidemiology. Laboratory diagnostics. Drugs for specific prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-23	Chlamydia Pathogens of ornithosis, trachomes. Features of epidemiology. Laboratory diagnostics. medicines for Chlamydia treatment	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-24	Pathogens of actynomycoses. Features of epidemiology. Laboratory diagnostics. medicines for treatment	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	

SEW-25	Pathogenic protozoa (leishmania. ameba, toxoplasma, thyhomoniads, lamblia). Features of epidemiology. Laboratory diagnostics. Drugs for allergogyagnostics, treatment, prevention.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-26	Clinical microbiology. Features of opportunistic microorganisms and diseases caused by them. Rules of collection and transport-use of clinical material. Methods of microbiological research in clinical microbiology. Hospital infections. The problem of COVID-19 as a hospital infection.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-2, Kn-3, Kn-4, Kn-5, Kn-6, Ab-2, Ab-3, Ab-4, Ab-6, Ab-7, Ab-8, C-1, C-2, C-3, C-4, C-5, C-6, C-7, AU-1, AU-2, AU-3, AU-4, AU-5, AU -6, AU-7, AU-8*	
SEW-27	Phytopathogenic microorganisms. Features of the diagnosis of plant diseases. Methods of prevention of development and fight against phytopathogenic damage of plant medicinal raw materials.	Processing the list of questions of the lesson. Preparation of answers to questions for self-control.	*Kn-1, Kn-5, Ab-1, Ab-5, Ab-7 C-1, C-2, C-5, AU-2, AU-5,*	

In the educational process, when teaching the discipline "Microbiology with the basics of immunology", traditional teaching methods are used: verbal, visual, practical; methods of educational and cognitive activity: explanatory and illustrative, problematic presentation, search, research, methods of stimulation and motivation of educational and cognitive activity, methods of control and self-control (control and correction by the teacher, self-control and self-correction, mutual control and mutual correction).

8. Description of learning outcomes

In-process control

Topic mastery (current control) is checked during practical classes in accordance with specific objectives. Practical skills control is implemented on the basis of the manufacture and research of microscopic drugs, determination of morpho-tinctoryal, cultural, biochemical and antigenic properties of microorganisms, study of their factors of pathogenicity, establishment of sensitivity to antimicrobial agents, setting and interpretation of the results of serological reactions, interpretation of the results of microbiological study of various clinical material, as well as the study of microflora of external ser edovyshcha. The assessment is carried out by directly controlling the teacher's performance of the student's skills, as well as using illustrated tests.

At each practical lesson, students' knowledge is evaluated according to the four-score system ("5", "4", "3", "2") according to the criteria for assessing the current activity of the student.

Evaluation of student's Self Education Work.

The material for the independent work of students, which is provided in the topic of practical

training simultaneously with classroom work, is evaluated during the current control of the topic at the appropriate classroom. Evaluation of topics that are submitted for independent study and are not included in the topics of classroom training sessions is carried out during the final control (exam).			
Learning outcome code	Code type of lessons	Method of verification of learning results	Enrollment criteria
Kn-1	L-1, L-2, L-3, L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19 P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28 P-29, SEW-1, SEW-2, SEW-3, SEW-4, SEW-5, SEW-6, SEW-7, SEW-8, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27	Attend lectures and practical classes. Performing written tasks to the topic (test tasks, questions for self-control, situational tasks). Demonstration of practical skills. Execution of practical training protocols. Participation in discussions, discussion of issues submitted for independent processing. Independent work of students is evaluated during the current control of the topic in the appropriate class. Topics that are submitted only for independent work, students are processed in a separate school, the performance is checked by the teacher and their enrollment is recorded in the academic journal. For the current control of students' knowledge, test tasks have been created, which contain standard tests on the topic of the lesson (including tests	It is necessary to enroll in the discipline to • full compliance with the requirements of the curriculum; • correct solution of tasks both during classroom work and those offered for independent study. Excellent (“5”) - The student answers 90-100% of the tests correctly. Correctly, clearly, logically and fully answers all questions. Can closely link theory and practice, correctly demonstrates the implementation of practical skills. Solves situational problems of increased complexity, knows how to generalize the material, has research methods to the extent necessary for the pharmacist's activities. Good ("4") – The student correctly answered 71-89% of the tests. Correctly and in essence answered the question. Demonstrates the implementation of practical skills. Correctly uses theoretical knowledge in solving practical problems. He knows how to solve light and
Kn-2	L-4, L-5, L-6, L-7, L-8, L-9, L-10 P-8, P-9, P-10, P-11, P-12, P-13, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P24. P-25, P-26, P-27, P-28 SEW-6, SEW-7, SEW-8, SEW-10, SEW-11 SEW-12, SEW-13, SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26		

		with several correct answers), theoretical questions, which include questions from the lecture course and questions from independent work; situational tasks (with 3 questions); practical skills according to the topic of the lesson. *Evaluation of test tasks:* Excellent (“5”) - The student answers 90-100% of the tests correctly. Good ("4") – The student correctly answered 71-89% of the tests. Satisfactory ("3") – The student correctly answered 60-70% of the tests. Unsatisfactory ("2") – The student answered less than 60% of the tests. Unsatisfactory ("2") – The student answered less than 60% of the tests. Unsatisfactory ("2") – The student answered less than 60% of the tests. *Practical skills assessment:* "5" - demonstration of skills correct, complete; "4" - demonstration of skills with 2-3 minor errors; "3" - demonstration of skills with 1	medium complexity situational problems. It has the necessary practical skills and methods of their implementation to the extent exceeding the required minimum. Satisfactory ("3") – The student correctly answered 60-70% of the tests. Incompletely, with the help of additional questions, answers questions. Cannot independently build a clear, logical answer. During the response and demonstration of practical skills, the student makes mistakes. The student solves only the easiest tasks, has only a mandatory minimum of research methods. Unsatisfactory ("2") – The student answered less than 60% of the tests. Does not know the material of the current topic, can not build a logical answer, does not answer additional questions, does not understand the material. During the response and demonstration of practical skills, the student makes mistakes.
Kn-3	L-3, L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-10, SEW-11, SEW-12, SEW-13, SEW-14 SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26		
Kn-4	L-5, L-6, L-7, L-8, L-9, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
Kn-5	L-1, L-2, L4, L-5, L-6, L-7, L-8, L-9, L-10, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29, SEW-1, SEW-2, SEW-3, SEW-4, SEW-5 SEW-6, SEW-7, SEW-8, SEW-10, SEW-11, SEW-12, SEW-13, SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		

		significant, gross error or more than 3 minor mistakes. "2" - demonstration of skills is completely wrong or with 2 or more gross mistakes. *Evaluation of the theoretical question:* "5" - the answer is correct, complete; "4" - the answer is correct, incomplete; "3" - answer with errors, incomplete; "2" is not essentially illogical. *Assessment of situational problem:* "5" - correct, complete answers to all questions; "4" - correct, complete answers to two questions; "3" is the correct, complete answer to one question; "2" - the answers to all questions are wrong or missing.	
Kn-6	L-3, L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-9, P-12, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
Kn-7	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-9, P-12, P-16, P-17, P-18, P-19, P-20, P-28, SEW-7, SEW-10, SRS-11, SRS-12, SRS-13, SRS-14, SRS-15, SRS-16		
Kn-8	L-4, L-5, P-14, P-15, P-20		
Ab-1	L-10 P-16, P-17, P-18, P-18, P-20, P-29, SEW-7, SEW-10, SRS-11, SRS-12, SRS-13, SRS-14, SRS-16, SEW-27		
Ab-2	L-5, L-6, L-7, L-8, L-9, P-10, P-11, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-7, SEW-8, SEW-9, SEW-10, SEW-11 SEW-12, SEW-13, SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23,		

	SEW-24, SEW-25, SEW-26		
Ab-3	L-3, L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
Ab-4	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
Ab-5	L-1 L-2 P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-10 P-11 P-14 P-15 P-16 P-17 P-18 P-19 P-20 P-29 SEW-1 SEW-3 SEW-4 SEW-5 SEW-8 SEW-10 SEW-11 SEW-12 SEW-13 SEW-14 SEW-15 SEW-16 SEW-27		
Ab-6	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28 SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14,		

	SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
Ab-7	L-1, L-2, L4, L-5, L-6, L-7, L-8, L-9, L-10, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-12, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-29, SEW-3, SEW-4, SEW-5, SEW-6, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
Ab-8	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-9, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
C-1	L-1, L-2, L-3 L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29, SEW-1, SEW-2,		

	SEW-3, SEW-4, SEW-5, SEW-7, SEW-8, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13, SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
C-2	L-1, L-2, L-5 L-6, L-7, L-8, L-9, L-10 P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29, SEW-3, SEW-4, SEW-5, SEW-6, SEW-7, SEW-8, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13, SEW-14, SEW-15, SEW-16. SEW-17, SEW-18, SEW-19, SEW-20 SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
C-3	L-4, L-5, L-6, L-7, L-8, L-9, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
C-4	L-3, L-4, L-5, L-6, L-7, L-8, L-9, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26,		

	P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
C-5	L-3, L-4, L-5, L-6, L-7, L-8, L-9, L-10 P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20. P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29, SEW-7, SEW-8, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
C-6	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-9, P-12, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-15, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
C-7	L-4, L-5, L-6, L-7, L-8, L-9, P-9, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14,		

	SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
C-8	L-5 P-14, P-15, P-20, P-23, P-25, P-26, P-27		
AU-1	L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
AU-2	L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-8, P-9, P-10, P-11, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29 SEW-8, SEW-9, SEW-10, SEW-11 SEW-12, SEW-13, SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
AU-3	L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19,		

	SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
AU-4	L-3, L-4, L-5, L-6, L-7, L-8, L-9, P-8, P-10, P-11, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-8, SEW-9, SEW-10, SEW-11 SEW-12, SEW-13, SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26		
AU-5	L-1, L-2, L4, L-5, L-6, L-7, L-8, L-9, L-10, P-1, P-2, P-3, P-4, P-5, P-6, P-7, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, P-29, SEW-3, SEW-4, SEW-5, SEW-8, SEW-9, SEW-10, SEW-11 SEW-12, SEW-13, SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26, SEW-27		
AU-6	L-4, L-5, L-6, L-7, L-8, L-9, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23,		

	SEW-24, SEW-25, SEW-26,		
AU-7	L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, SEW-9, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		
AU-8	L-4, L-5, L-6, L-7, L-8, L-9, L-10, P-9, P-10, P-11, P-12, P-16, P-17, P-18, P-19, P-20, P-21, P-22, P-23, P-24, P-25, P-26, P-27, P-28, SEW-8, SEW-10, SEW-11, SEW-12, SEW-13 SEW-14, SEW-16, SEW-17, SEW-18, SEW-19, SEW-20, SEW-21, SEW-22, SEW-23, SEW-24, SEW-25, SEW-26,		

Final control		
Total Evaluation System. assessing	Participation during semester / exam - 60%/40% on a 200-point scale	
Scales of assessing	traditional 4-point scale, multi-scale (200-points) scale, rating scale ECTS	
Conditions of admission to summary control	The student attended all practical (laboratory, seminar) classes and received at least 120 points for current success	
Summary View control	Methodology of final control	Criteria Of admission
	All topics submitted to the In-process control Scores from the 4-point scale are converted to points on a multi-point (200-point) scale in accordance with the Regulations "Criteria, rules and procedures for assessing learning outcomes of students	*Max Number of points - 200* *Min Number of points -120*

The Assessment Criteria

Students who have completed all types of work provided for in the curriculum and scored at least the minimum number of points during the study of the module are allowed to take the final assessment.

Exam	**Methodology and means of standardized evaluation during the exam.** Regulations of the exam The exam consists of the following stages: Stage I – written response to A-format test tasks (blank test control). The student responds to the test package. Each package contains 40 A-format tests on the topics of each meaningful module. Stage II – written detailed answer to 4 theoretical questions and 2 situational tasks. The student receives a block of questions – 4, which must be answered in writing, as well as a block of situational problems - 2, which must be solved in writing. Stage III – practical skills testing. The student demonstrates knowledge and performance of 2 practical skills.	The correct answer to each of **the 40 test** tasks is rated at 1 point. Evaluation of each of **the 4 theoretical questions is** carried out as follows: **5 points** – the student correctly, clearly, logically and deployedly answers the question. **4 points** – the student correctly, in fact, but incompletely answers the question. **3 points** – the student incompletely answers the questions, makes mistakes. **0-2 points** – the student incorrectly answers the question, does not know the material, makes significant, gross mistakes. Evaluation of each of **the 2 situational tasks is** carried out as follows: **5 points** – correct full answers to the questions of the task. **4 points** - correct incomplete answers to questions. **3 points** – the answers to the questions of the task are incomplete, with errors. **0-2 points** – the answer is wrong or missing. Evaluation of each of **the 2 practical skills is** as follows: **5 points** – correctly demonstrates the implementation of practical skills, correctly, clearly and logically interprets the results of the accounting of serological reactions, antibioticgrams,

		correctly and fully describes the microscopic picture, correctly carries out the accounting of the cultural and biochemical properties of microorganisms, determine the factors of pathogenicity, clearly and logically interprets the results of the accounting. Closely links the theory with practice. **4 points** - Correctly uses theoretical knowledge in solving practical problems. It has the necessary practical skills and methods of their implementation to the extent exceeding the required minimum. **3 points** - During the response and demonstration of practical skills, the student makes mistakes. **0-2 points** – the answer is wrong or missing.

Maximum number ofpoints a student can score for current academic activities for admission to the exam is 120 points.
The minimum number ofpoints that a student must score for current academic activity for admission to the exam is 72 points.

The maximum number of points of final control (exam) is 80. The exam was taken – the student scored 50 or more points. The exam was not taken – the student scored less than 50 points.

The number of points assigned to students at the end of the discipline is calculated as the sum of points for current academic activity and points for final control (exam).

The calculation of the number of points is carried out on the basis of the grades received by the student for 4
(national) scale during the study of discipline, by calculating the arithmetic mean (CA), rounded to two decimal places. The resulting value is converted into points on a multi-point scale as follows:

$$= \frac{CA \times 120}{5}$$

9. Policy of discipline

Academic integrity.
During the scientific-pedagogical process, students (applicants) and teachers are obliged

to follow the Code of Academic Ethics of the Danylo Halytsky Lviv National Medical University, as a document that defines the standards generally accepted by the world community for the implementation of educational and scientific activities by applicants of higher education and university employees and creates an environment of intolerance to violations of academic integrity and ethics of academic relationships.

https://nauka.meduniv.lviv.ua/wp-content/uploads/kodeks-akademichnoyi-etiki-2021.pdf

The organization of the educational process is carried out on the basis of the credit-transfer system with the use of rating evaluation of students' success. Inadmissible: copying and plagiarism; absences and lateness to classes; using a mobile phone, tablet or other mobile devices during class (except for cases provided for by the curriculum and methodical recommendations of the teacher); untimely completion of tasks set by the teacher during the current, final control of knowledge, as well as independent work of students. The discovery of signs of academic dishonesty in a student's work is a reason for the teacher not to enroll it, regardless of the scale of plagiarism or deception.

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Any form of violation of academic integrity will not be tolerated. In case of such events, respond in accordance with the Code

https://nauka.meduniv.lviv.ua/wp-content/uploads/kodeks-akademichnoyi-etiki-2021.pdf

The procedure and algorithm of the appeal.

The student has the right to get acquainted with the results of his examination (credit) written work no later than 2 working days after its writing and to receive an explanation of the received grade. In case of procedural violations, disagreement with the assessment, the student has the right to submit a written appeal to the head of the department, indicating the specific reasons for disagreement with the assessment. The appeal procedure and the evaluation rules and procedures are described in detail in the Regulations on Evaluation Rules and Procedures Criteria. The appeal regarding the results of the final control of the knowledge of the students of higher education is a component of the organizational support of the educational process, which is carried out to determine the objectivity of the given assessment. The main task of the appeal procedure is to overcome the elements of subjectivism during the evaluation of knowledge, to avoid misunderstandings and controversial situations, to create the most favorable conditions for the development and real provision of the legal rights and interests of the student. The head of the department together with the examiner, involving other specialists, forms a commission to consider the issue of compliance with the procedure and within three working days ensures consideration of the appeal and verbally informs the student of the results of the review. In the case of confirmation of the circumstances stated in the student's application, by order of the rector (vice-rector for scientific and pedagogical work), a new control event is held with a different composition of the commission.

10. Reference

Basic literature

1. Medical microbiology,virology and immunology=Медична мікробіологія, вірусологія та імунологія : a textbook for English-speaking students of higher medical schools: translation from ukr.Published / [T.V. Andrianova, V.V. Bobyr, V.V. Danyleichenko, ect.] ed. by V. P. Shyrobokov. Vinnytsia: Nova Knyha, 2019. - 744 p. : ill.

2. Medical microbiology and immunology = Медична мікробіологія та імунологія : підручник / Тимків М. З. , Корнійчук О. П., Павлій С. Й. [та ін.]. – Вінниця : Нова Книга, 2019. – 416 с.

3. Ananthanarayan and Paniker’s Textbook of Microbiology.- 7th ed.-N.Y., 2005.- P. 7 – 24.

4. Fritz H. Kayser, Kurt A. Bienz, Johanenes Eckert, Rolf M. Zinkernagel Medical Microbiology. – Thieme, 2010. – P. 4 – 6, 146 – 148

Additional literature

6. Lakshman P., Samaranayake Essential Microbiology for Dentistry. – 3ed ed. – Elevier Limitid, 2006. – P. 7 – 15. 6. Richard J. Lamont and Howard F. Wiley Oral Microbiology at a Glance, 1st ed.. – Blackwell Jenkinson, 2010.
7. 7. Philip D. Marsh, Michael V. Martin Oral Microbiology Text and Evolve eBooks Package, 5th ed. – FRCPath FFGDPDCS (UK), 2009.
8. Jawetz Melnick & Adelbera's Medical Microbiology.- 25th ed.- Mc Graw Hill Medical, 2010. – P. 8 - 13, 39.
9. Michael J.Pelczar, JR, E.C.S. Chan, Noel R. Krieg Microbiology. – 5th ed. – Tata McGraw-Hill Publishing Company Limited, 2002.- P.50 – 99.
10. Kathleen Park Talaro, Arthur Talaro Fundationsin Microbiology.- 4th ed.- Mc Graw Hill, 2002.- P. 8 – 9, 18 – 21, 70 – 79, 87 – 107.

Links to professional periodicals:

1. https://fems-microbiology.org/about_fems/network-and-activities/journals/
2. https://elibrary.escmid.org/; https://www.escmid.org/escmid-publications/manual-of-microbiology
3. https://asm.org/a/Microcosm-Digital-Magazine
4. Microbiological journal https://microbiolj.org.ua/ua/archiv
5. The world of medicine and biology https://womab.com.ua/ua/arcive
6. Microbiology and biotechnology http://mbt.onu.edu.ua/issue/archive
7. Regulatory mechanisms in Biosystems https://medicine.dp.ua/index.php/med/issue/archive

Information resources

Microbiology and immunology on-line
http://www.microbiologybook.org/On-line microbiology note
http://www.microbiologyinfo.com/
Centers for diseases control and prevention www.cdc.gov

11. Equipment, material, technical and software discipline / course

Access to the Internet
Multimedia interactive projector Panasonic – available, commissioned in 2013
TVs – 2 pcs.
Fluorescent microscope LUMAM R-8 MBI-6 (900213) – No 1
Autoclave
Dry heater
Refrigerators
Analytical scales VLR-200 - No1,
Thermostat TS-80 M - No 5 Dosings 10-1000.0 mkl from 3 square meters. 2016 - 4 -
Petri cups, bacteriological loops, tweezers
Discs with antibiotics - No50
Measuring utensils
Nutrients Endo, BA, MPA, MPB, YSA, Saburo.
Burners

12. Additional information

Lectures and practical classes are held at: City of Lviv, Zelena 12 street.
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