

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ,
МИНИСТЕРСТВО НАУКИ, ВЫСШЕГО ОБРАЗОВАНИЯ И ИННОВАЦИЙ
КЫРГЫЗСКОЙ РЕСПУБЛИКИ

МОО ВО Кыргызско-Российский Славянский университет
имени первого Президента Российской Федерации Б.Н. Ельцина

УТВЕРЖДАЮ

декан факультета

_____ 2024 г.

ПРОФЕССИОНАЛЬНЫЙ ЦИКЛ
Микробиология, вирусология

рабочая программа дисциплины (модуля)

Закреплена за кафедрой

Микробиологии и вирусологии

Учебный план

31050150_24_1 лд ин.рпх
Специальность 560001 - КР Лечебное дело
(для иностранных студентов)

Квалификация

врач

Форма обучения

очная

Общая трудоемкость

6 ЗЕТ

Часов по учебному плану

192

Виды контроля в семестрах:

в том числе:

экзамен 3
зачет 2

аудиторные занятия

96

самостоятельная работа

63,7

31,5

Распределение часов дисциплины по семестрам

Семестр (<Курс>.<Семестр на курсе>)	2 (1.2)		3 (2.1)		Итого	
Неделя	16		16			
Вид занятий	уп	рп	уп	рп	уп	рп
Лекции	16	16	16	16	32	32
Практические	32	32	32	32	64	64
Контактная работа в период теоретического обучения	0,3	0,3			0,3	0,3
Контактная работа в период экзаменационной сессии			0,5	0,5	0,5	0,5
В том числе инт.	4	4	4	4	8	8
Итого ауд.	48	48	48	48	96	96
Контактная работа	48,3	48,3	48,5	48,5	96,8	96,8
Сам. работа	47,7	47,7	16	16	63,7	63,7
Часы на контроль			31,5	31,5	31,5	31,5
Итого	96	96	96	96	192	192



УП: 31050150_24_1 лд ин.рпх

стр. 2

Программу составил(и):

Doctor of Medical Sciences, Professor, Head of the Department of Microbiology and Virology, Sadybakasova G.K

Рецензент(ы):

Candidate of medical sciences, associate professor of microbiology, virology and immunology department, Niyazaliev M.S.; Doctor of Medical Sciences, Professor, associate professor of infectious diseases department of KRSU, Kuratova D.J

разработана в соответствии с ФГОС 3++:

Федеральный государственный образовательный стандарт высшего образования - специалитет по специальности 31.05.01
Лечебное дело (приказ Минобрнауки России от 21.09.2021 г. № 1578/1)

составлена на основании учебного плана:

Специальность 560001 - КР Лечебное дело
(для иностранных студентов)

утвержденного учёным советом вуза от _____ протокол № _____

Рабочая программа одобрена на заседании кафедры

Протокол от _____ 2024 г. № _____

Срок действия программы: уч.г.

Зав. кафедрой



УП: 31050150_24_1_лд.ин.plx

стр. 3

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

_____ 2025 г.

Рабочая программа пересмотрена, обсуждена и одобрена для
исполнения в 2025-2026 учебном году на заседании кафедры

Протокол от _____ 2025 г. № _____

Зав. кафедрой

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

_____ 2026 г.

Рабочая программа пересмотрена, обсуждена и одобрена для
исполнения в 2026-2027 учебном году на заседании кафедры

Протокол от _____ 2026 г. № _____

Зав. кафедрой

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

_____ 2027 г.

Рабочая программа пересмотрена, обсуждена и одобрена для
исполнения в 2027-2028 учебном году на заседании кафедры

Протокол от _____ 2027 г. № _____

Зав. кафедрой

Визирование РПД для исполнения в очередном учебном году

Председатель УМС

_____ 2028 г.

Рабочая программа пересмотрена, обсуждена и одобрена для
исполнения в 2028-2029 учебном году на заседании кафедры

Протокол от _____ 2028 г. № _____

Зав. кафедрой



1. ЦЕЛИ ОСВОЕНИЯ ДИСЦИПЛИНЫ	
1.1	The objectives of mastering the discipline "Microbiology, Virology" is to obtain knowledge about pathogenic and opportunistic microorganisms for humans; about their structure, physiology, genetics, ecology; about the role of microorganisms in the etiology and pathogenesis of infectious diseases; about immunity as a state of a macroorganism in which an infectious process develops and its changes under various influences of environmental factors; about methods of microbiological diagnostics, specific prophylaxis and therapy of infectious diseases.

2. МЕСТО ДИСЦИПЛИНЫ В СТРУКТУРЕ ООП	
Цикл (раздел) ООП:	Б1.О.03
2.1	Требования к предварительной подготовке обучающегося:
2.1.1	Medical Biology
2.1.2	Biochemistry
2.1.3	Anatomy
2.1.4	Histology, Embryology, Cytology
2.1.5	Normal Physiology
2.1.6	Latin Language
2.2	Дисциплины и практики, для которых освоение данной дисциплины (модуля) необходимо как предшествующее:
2.2.1	Immunology
2.2.2	Gynecology
2.2.3	Epidemiology
2.2.4	Dermatovenereology
2.2.5	Infectious Diseases
2.2.6	Phthisiology
2.2.7	Dentistry
2.2.8	Obstetrics
2.2.9	Urology
2.2.10	Immunoprophylaxis of Infectious Diseases
2.2.11	Family Medicine
2.2.12	Disaster Medicine
2.2.13	Hygiene (или Public Health Hygiene в некоторых программах)
2.2.14	Otorhinolaryngology (ENT)
2.2.15	Ophthalmology
2.2.16	Pediatrics
2.2.17	Hospital Therapy (или Internal Medicine (Hospital) — более международный вариант)
2.2.18	General Surgery
2.2.19	Hospital Surgery
2.2.20	Oncology, Radiation Therapy
2.2.21	Occupational Diseases

3. КОМПЕТЕНЦИИ ОБУЧАЮЩЕГОСЯ, ФОРМИРУЕМЫЕ В РЕЗУЛЬТАТЕ ОСВОЕНИЯ ДИСЦИПЛИНЫ (МОДУЛЯ)	
ПК-10: Способен и готов осуществлять профилактические мероприятия по предупреждению инфекционных, паразитарных и неинфекционных болезней.	
Знать:	
Уровень 1	Know: Level 1 World order, the existence of the microworld, forms of symbiosis of different organisms, the influence of environmental factors on macroorganism, the role of microorganisms in the development of human diseases



Уровень 2	<p>Level 2</p> <p>Features of the formation of the processes of symbiosis of the human body with microbes, the role of the resident microflora of the body in the development of opportunistic diseases;</p> <p>the role of individual representatives of the microbial world in the etiology and pathogenesis of the most common human infectious diseases, their sensitivity to antimicrobial drugs</p> <p>Features of the formation of the processes of symbiosis of the human body with microbes, the role of the resident microflora of the body in the development of opportunistic diseases;</p> <p>the role of individual representatives of the microbial world in the etiology and pathogenesis of the most common human infectious diseases, their sensitivity to antimicrobial drugs</p>
Уровень 3	<p>Level 3</p> <p>Pathogenic and virulent properties of microbes and their role in the pathogenesis of an infectious disease.</p> <p>The role of opportunistic microflora in human pathology and in the development of nosocomial and iatrogenic diseases.</p>
Уметь:	
Уровень 1	<p>Ability:</p> <p>:</p> <p>Level 1</p> <p>Solve typical tasks for the formation of a healthy lifestyle (such as: wash hands before eating, brush your teeth, follow the rules of personal hygiene, etc.), draw and distinguish between prokaryotes and eukaryotes</p>
Уровень 2	<p>Level 2</p> <p>To substantiate, from a microbiological standpoint, the choice of material and methods of microbiological research in the diagnosis, differentiation and identification of pathogens of infectious and opportunistic diseases, as well as the tactics of prescribing specific drugs for treatment and prevention</p>
Уровень 3	<p>Level 3</p> <p>Take material (sputum, pus, blood, smear from plaque, gum pocket, from the root of the tongue, pharynx, etc.) for bacteriological, virological, serological examination; isolate a pure culture of the infectious agent, differentiate and identify</p>
Владеть:	
Уровень 1	<p>Skills:</p> <p>:</p> <p>Level 1</p> <p>Information about the unified laws of the development of living beings of the macro- and microworld, the unified structure of the carrier of genetic information, about variability and evolution</p>
Уровень 2	<p>Level 2</p> <p>Basic skills in working with material containing pathogenic and opportunistic microorganisms and methods of decontamination</p>
Уровень 3	<p>Level 3</p> <p>Knowledge to solve complex problems in emergency situations (during an outbreak of infection, food poisoning, an epidemic, a particularly dangerous infection, the use of bacteriological weapons) in order to quickly localize the infection, organize quarantine measures, decontaminate infected material, and carry out preventive procedures</p> <p>Grading scale in APPENDIX No. 1</p>

В результате освоения дисциплины обучающийся должен

3.1	Знать:
3.1.1	<p>Know (i.e. reproduce and explain educational material with the required degree of scientific accuracy and completeness):</p> <p>The main stages in the development of microbiology. Communication of science with other disciplines, tasks and methods of research, the principle of taxonomy of microorganisms. The structure and shape of a microbial cell with the function of various formations, their chemical composition, physiology, biochemistry of bacteria, features of nutrition, respiration, growth, reproduction. Distribution and role of microbes in the environment. Influence of environmental factors on microorganisms. Morphology, ultrastructure, classification and nature of viruses. Features of replication of DNA and RNA genomic viruses, their cultivation, antigens, production and use of phages. Nature of prions and features of prion diseases. Features of the genetics of bacteria and viruses. The role of mutations, recombinations in the evolution of bacteria. Extrachromosomal factors of heredity. The concept of genetic engineering, practical application. Sources and methods for obtaining antibiotics, their classification by structure, spectrum and mechanism of action. Features of genetic control of pathogenicity and antibiotic resistance of microbes, mechanisms of resistance development. Complications in antibiotic therapy, methods for determining the sensitivity of microbes to antibiotics. Features of the formation of the processes of symbiosis of the human body with microbes, the role of the resident microflora of the body in the development of opportunistic diseases.</p>



3.1.2	The mechanism and factors of the development of the infectious process. Pathogenicity and virulence of microbes. The role of conditionally pathogenic microflora in human pathology, the development of nosocomial infections. Formation of immunity, its types, mechanisms and factors: immunocompetent cells, their interaction in cellular and humoral immunity. Antigens of microbes and viruses, their properties, types. Mechanisms of interaction between antigens and antibodies. Mechanisms of development of allergy of immediate and delayed types, forms of manifestation, and preventive measures. The role of individual representatives of the microbial world in the etiology and pathogenesis of major human infectious diseases. Methods of microbiological diagnostics. How to take material (sputum, pus, blood, urine, feces, swab from the throat, hands, environmental objects, etc.) for bacteriological, virological and serological studies in children. The use of basic antibacterial, antiviral and specific drugs. Vaccines, their types; immune diagnostic and therapeutic preparations. Principles of their obtaining and application.
3.2	Уметь:
3.2.1	Ability:
3.2.2	Be able to (i.e. solve typical problems based on the reproduction of standard solution algorithms): Observe the rules of the sanitary-hygienic and anti-epidemic regime in the bacteriological laboratory.
3.2.3	Justify from microbiological positions the choice of material for research in the diagnosis of infectious and opportunistic diseases. Observe safety precautions and rules for working with material that poses a biological hazard. Prepare preparations for microscopy from the test material (pus, sputum, blood, etc.) and a pure culture of microbes. Stain smears with simple and complex methods (according to Gram, Ziehl-Nielsen, Neisser, Gims, Romanovsky-Giemsma, etc.). Set up and work with phase-contrast, luminescent and dark-field microscopes. Prepare basic nutrient media for the cultivation of microorganisms. Inoculate the test material on liquid and solid nutrient media. Select a pure culture of microbes - aerobes and obligate anaerobes. To identify the isolated pure culture of bacteria by morphological, tinctorial, cultural, biochemical and antigenic properties. Determine phage sensitivity and phage type of bacterial culture. To study the sensitivity of bacteria to antibiotics. Work with laboratory animals: fix, infect in various ways, take blood, perform an autopsy of the corpse of an animal, make smears
3.2.4	Imprints of organs, blood cultures. To cultivate obligate intracellular parasites, prepare a cell culture (primary trypsinized single-layer from chicken embryos and transplanted). Infect cell culture and chick embryo. Carry out the indication and identification of viruses in cell culture and on the chick embryo. Use the acquired knowledge to determine the tactics of antibacterial, antiviral and immunotropic therapy; apply the principles of emergency prevention and antitoxic therapy of patients.
3.3	Владеть:
3.3.1	Skills:
3.3.2	The student can demonstrate the ability to solve complex problems based on the acquired knowledge, skills and abilities, with their application in atypical situations, i.e. owns: The main methods of sterilization, disinfection and aseptic treatment of instruments and equipment in order to avoid infection of the doctor and patient. The skills of making a preliminary diagnosis based on the results of a laboratory microbiological examination of the adult population and adolescents. The methodology for interpreting the results of microbiological research, determining the antimicrobial activity of antibiotic drugs and microbiologically substantiated rules for their use for the treatment of patients. Basic skills of working with material containing pathogenic and opportunistic microorganisms. Methods of selection of antimicrobial and immunobiological drugs for adequate prevention and treatment of infectious diseases. Basic skills in working with modern devices used to diagnose infectious diseases.

4. СТРУКТУРА И СОДЕРЖАНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)

Код занятия	Наименование разделов и тем /вид занятия/	Семестр / Курс	Часов	Компетенции	Литература	Инте ракт.	Пр. подг.	Примечание
	Раздел 1. Section 1. The morphology of micro-organisms. Physiology of microorganisms.							
1.1	1. The subject and tasks of medical microbiology. Principles of taxonomy and nomenclature of bacteria. Morphology and structure of the bacterial cell, chemical composition, and the functional role of its constituent components in the process of vital activity /Лек/ /Лек/	2	2					

1.2	Structure and equipment of a bacteriological laboratory. Methods of investigation in microbiology. Microscopes: light (biological), fluorescent, phase-contrast, electron microscopes, and the principles of their operation. Main forms of bacteria /Pr/ /Пп/	2	2	0,5		
1.3	Preparation of smears from pus, blood, and sputum. Simple staining method. Preparation of a smear by the Burri method. Complex staining methods: Gram staining and Ziehl–Neelsen staining. Acid-fast microorganisms. Spore formation. Spore staining /Pr/ /Пп/	2	2	0,5		
1.4	Structure of the microbial cell. Capsule and methods of its detection. Volutin granules and their staining. Motility of microorganisms. Methods for studying motility. Ultramicroscope /Pr/ /Пп/	2	2	0,5		
1.5	Test No. 1 on “Morphology of Microorganisms” /Pr/ /Пп/	2	2			
1.6	Microbiological methods of investigation. Modern rapid diagnostic methods in medical microbiology /SSW/. /Cp/	2	3			
1.7	Physiology of bacteria. Nutrition. Sources of carbon and types of bacterial nutrition. Autotrophs, heterotrophs, prototrophs, auxotrophs. Growth factors. Culture media. Transport of nutrients into the cell. Bacterial enzymes: classification and significance. Biosynthesis of carbohydrates and proteins. Determination of saccharolytic and proteolytic enzymes and enzymes of pathogenicity. /Lec/ /Лек/	2	2			
1.8	Energy metabolism (biological oxidation). Types of respiration. Aerobes. Anaerobes. Methods for creating anaerobic conditions. Pigments. Growth and reproduction of bacteria on solid culture media — colonies, their characteristics and significance; on liquid media — phases of development of the bacterial population. Principles of cultivation, isolation of a pure culture, and identification. Antibiotics: sources and methods of production. Classification by chemical structure, spectrum of activity, and mechanism of action. Complications of antibiotic therapy /Lec/ /Лек/	2	2			

1.9	Antibiotics. Microbiological and molecular-biological foundations of chemotherapy. Main groups of antimicrobial chemotherapeutic agents. Mechanisms of the development of microbial drug resistance. Methods for overcoming microbial resistance to antibiotics /SSW/ /Cp/	2	2,7				
1.10	Sterilization and Disinfection. Bacterial Nutrition. Classification of Bacteria by Type of Nutrition. Nutrient media, their classification, principles of preparing simple media such as MPA (Meat-Peptide Agar), MPB (Meat-Peptide Broth). Microbial reproduction. Techniques for inoculation and cultivation of microbes. Bacterial respiration. Methods for isolating pure cultures of aerobic and anaerobic bacteria. Colony counting. Principle of thermostat operation /Pr/ /Tp/	2	2		0,5		
1.11	Differentiation and Identification of Microbes. Microbial enzymes, their classification. Practical significance and study of microbial biochemical activity. Giss' colored series, Endo medium. Bacterial pigments and their significance. Antibiotics: concept, classification, mechanisms of action on microbes, side effects on the host organism. Determination of microbial sensitivity to antibiotics. Mechanisms of development of microbial resistance to antibiotics /Pr/. /Tp/	2	2		0,5		
1.12	Ways to Overcome Drug Resistance in Microbes Strategies to combat microbial drug resistance. Dysbacteriosis (dysbiosis) – imbalance in the normal microbial flora /SSW/. /Cp/	2	2				
1.13	Human Microflora Throughout Life and Its Role in Normal Physiological Processes and Pathology Changes in human microflora over the course of life. Role of microflora in maintaining normal physiological processes. Impact of microflora in pathological conditions /SSW/. /Cp/	2	2				



1.14	Microbial Metabolism: Catabolism and Anabolism. Metabolism in microbes: the sum of all chemical reactions occurring in the cell. Catabolism – breakdown of complex molecules to release energy. Anabolism – synthesis of complex molecules from simpler ones, requiring energy /SSW/. /Cp/	2	2					
1.15	Types of Symbiosis Between Organisms: Commensalism, Mutualism, Parasitism /SSW/. /Cp/	2	2					
1.16	Influence of environmental factors on microorganisms. The prevalence and role of microbes in the environment. The cycle of matter in nature. Of Microflora soil, water, air, food products. The microflora of the human body in the age aspect. /SSW/. /Cp/	2	2					
1.17	Ways to Overcome Drug Resistance in Microbes. Restrictions on the Use of Medicinal Drugs in Patients. /SSW/. /Лек/	2	2					
1.18	Colloquium №1. /Pr/. /Пп/	2	2					
1.19	часы на контроль /Экзамен/	3	31,5					
	Раздел 2. Section 2. General virology and Genetics of microorganisms.							
2.1	Structure, Chemical Composition, and Classification of Viruses. Viral Reproduction. Interaction of Viruses with the Host Cell – Stages of Productive, Integrative, and Abortive Forms of Cellular Infection. Defective Viruses. Cultivation and Indication of Viruses. Bacterial Viruses (Bacteriophages), Their Structure. Features of Phage Interaction with the Bacterial Cell. Lysogeny. Practical Application of Bacteriophages. Genotype and Phenotype of Bacteria. Extrachromosomal Hereditary Factors. Mutations. Genetic Recombination. Viral Genetics /Lec/. /Лек/	2	2					
2.2	Morphology of viruses, virological research methods. The structure of the chick embryo. Tissue culture, classification, methods of tissue culture preparation. Methods of cultivation and indication of viruses. Viruses of bacteriophages, nature, structure, properties. Practical application of bacteriophages. /Pr/. /Пп/	2	2	0,5				

2.3	Genetics of microorganisms. The organization of the genetic apparatus in bacteria and viruses. Modifications, mutations, dissociations. Recombination in bacteria: transformation, conjugation, transduction. Identification of nucleic acids. Polymerase-chain reaction. /Pr/. /Пр/	2	2	0,5				
2.4	Obtaining autovaccines, bacteriophages, mycophages using Biotechnology. /SSW/. /Cp/	2	2					
2.5	Genetic engineering and application of its achievements in human life and medical microbiology /SSW/. /Cp/	2	2					
Раздел 3. Section 3. Infectious process.								
3.1	Infection, infectious process, infectious disease. Pathogenicity and virulence of microbes. Virulence units. Toxins. Enzymes of pathogenicity. Experimental technique. Immunity. Non-specific and specific protective factors. /Pr/. /Пр/	2	2	0,5				
3.2	The concept of infection, infectious process, infectious disease. Pathogenicity and virulence of microbes, pathogenicity factors. Toxins. Enzymes of pathogenicity. Forms of infection. The role of conditionally pathogenic microflora in human pathology. /SSW/. /Cp/	2	3					
3.3	Factors and mechanisms of nonspecific resistance to infection. External and internal barriers, cellular factors: phagocytosis, natural killers, cytotoxicity. Humoral - lysozyme, complement system, interferons, cytokines, acute phase proteins. The influence of environmental factors on the reactivity of the body /SSW/. /Cp/	2	2					
3.4	Types of symbioses between different organisms. /SSW/. /Cp/	2	3					
3.5	Features of antibacterial immunity. Features of antiviral immunity. /SSW/. /Cp/	2	3					
3.6	Features of antifungal immunity. Features of antiparasitic immunity. /SSW/. /Cp/	2	2					
Раздел 4. Section 4. Private medical bacteriology.								

4.1	Pathogenic cocci - staphylococci, meningococci, gonococci. Classifications, morphology, biological properties. Diseases, pathogenesis, immunity. The role of streptococcus in the etiology of scarlet fever, erysipelas, rheumatism. Principles of laboratory diagnostics, treatment and prevention. /Pr/. /Пп/	2	2					
4.2	Microbiological diagnosis of diseases caused by streptococcus, pneumococcus, gonococci. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	2	2					
4.3	Causative agents of meningococcal and gonococcal infections. The causative agents of non-gonococcal urethritis are chlamydia, mycoplasmas. Morphology, cultural and pathogenic properties. Principles of laboratory diagnostics, treatment and prevention. /SWW/. /Cp/	2	3					
4.4	Causative agents of diphtheria, whooping cough (pertussis), parapertussis, tuberculosis, and leprosy. Morphology, cultural and pathogenic properties. Epidemiological features. Principles of laboratory diagnosis, treatment, and prevention /Lec/ /Лек/	2	2					
4.5	Microbiological diagnosis of tuberculosis, leprosy, actinomycosis. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	2	2					
4.6	The causative agents of mycoses: superficial, subcutaneous, deep, opportunistic (candidiasis, zygomycosis, aspergillosis, penicilliosis, fusarium). /SWW/. /Cp/	2	3					
4.7	Morphology of mushrooms. Classification. The meaning of mushrooms. The role of fungi in human pathology - mycoses. Causative agents and laboratory diagnosis of opportunistic mycoses - candidiasis, aspergillosis, penicilliosis. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Лек/	2	2					
4.8	Colloquium №2. /Pr/. /Пп/	2	2					



4.9	Classification of the family Enterobacteriaceae. Causative agents of intestinal infections – Escherichia coli and Shigella spp. Causative agents of typhoid fever and paratyphoid fevers A and B. Causative agents of salmonellosis – foodborne toxic infections. Causative agents of cholera. Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnosis, treatment, and prevention /Лec/. /Лек/	2	2					
4.10	Causative agents of typhoid, paratyphoid A and B. Causative agents of salmonellosis - food poisoning. Causative agents of cholera. Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnostics, treatment and prevention. /SWW/. /Cp/	2	3					
4.11	Microbiological diagnosis of colienteritis and dysentery. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пр/	2	2					
4.12	Microbiological diagnosis of cholera. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. Control No№2 /Pr/. /Пр/	2	2					
4.13	Контактная работа теоретическое обучение /КрТО/	2	0,3					
4.14	Causative agents of typhoid, paratyphoid A and B. Causative agents of salmonellosis - food poisoning. Causative agents of cholera. Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnostics, treatment and prevention. /SWW/. /Cp/	2	3					
4.15	Classification of the family Enterobacteriaceae. The causative agents of intestinal infections are Escherichia coli and Shigella. Morphology, cultural and pathogenic properties. Role in human pathology. Principles of laboratory diagnostics, treatment and prevention /SWW/.. /Cp/	2	3					



4.16	Microbiological diagnosis of colienteritis and dysentery. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	3	2			0,5	
4.17	Causative agents of typhoid, paratyphoid A and B. Causative agents of salmonellosis - food poisoning. Causative agents of cholera. Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnostics, treatment and prevention. /SWW/. /Cp/	3	2				
4.18	Microbiological diagnosis of typhoid fever, paratyphoid fever and food poisoning. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	3	2			0,5	
4.19	Microbiological diagnosis of cholera. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. Control No.№2 /Pr/. /Пп/	3	2			0,5	
4.20	The causative agents of anaerobic infections are clostridial gas gangrene, tetanus, botulism. Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnostics, treatment and prevention. /Lec/. /Лек/	3	2				
4.21	Causative agents of zoonotic infections: plague, tularemia, brucellosis, anthrax. Morphology, cultural and pathogenic properties, epidemiological characteristics. Role in human pathology. Principles of laboratory diagnosis, treatment, and prevention/Lec/. /Лек/	3	2				
4.22	Microbiological diagnosis of plague, tularemia. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	3	2			0,5	
4.23	Microbiological diagnosis of brucellosis, anthrax. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /Pr/. /Пп/	3	2			0,5	

4.24	Causative agents of spirochetoses (syphilis, relapsing fever, leptospirosis) and rickettsioses (epidemic and endemic typhus; Coxiella burnetii, the agent of Q fever). Morphology, cultural and pathogenic properties, epidemiological features. Role in human pathology. Principles of laboratory diagnosis, treatment, and prevention Lec./.. /Лек/	3	2				
4.25	Microbiological diagnosis of syphilis, epidemic whom and endemic relapsing fever, leptospirosis. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology. /SSW/. /Cp/	3	1				
4.26	Rickettsia of epidemic and endemic typhus. Coxiella Q fever. Morphology, cultural and pathogenic properties, epidemiological features. role in human pathology. Principles of laboratory diagnostics, treatment and prevention. /SSW/. /Cp/	3	1				
4.27	Microbiological diagnostics epidemic and endemic typhus, Q fever. Preparations for etiotropic and specific therapy, general and specific prevention of this pathology /Pr/. /Пр/	3	2	0,5			
4.28	Colloquium №3. /Pr/. /Пр/	3	2				
4.29	Microbiological diagnosis of diseases caused by staphylococci. Specific prevention and treatment. /SSW/. /Cp/	3	1				
4.30	Lyell's syndrome. /SSW/. /Cp/	3	1				
4.31	Classification of mycobacteria, oportunistic mycobacteria. /SSW/. /Cp/	3	1				
4.32	Causative agents of keratomycosis (epidermophytosis, microsporia, trichophytosis), dermatomycosis - types, morphological and biological properties, diagnosis, treatment and prevention. /SSW/. /Cp/	3	1				
4.33	Causative agents of subcutaneous mycoses (sporotrichosis, mycetoma), morphological and biological properties, diagnosis, treatment and prevention. /SSW/. /Cp/	3	2				
4.34	Causative agents of deep visceral mycoses (histoplasmosis, coccidioidomycosis, cryptococcosis), morphological and biological properties, diagnosis, treatment and prevention. /SSW/. /Cp/	3	1				

4.35	The role of Escherichia coli in normal and pathological conditions. Microbiological diagnosis of coli infections. Treatment, prevention. /SSW/. /Cp/	3	1					
4.36	Causative agents of campylo- and helicobacteria. Microbiological diagnostics. Treatment, prevention. /SSW/. /Cp/	3	2					
4.37	Pseudomonas aeruginosa. Microbiological diagnostics. Treatment, prevention. /SSW/. /Cp/	3	2					
Раздел 5. Section 6. Private Medical Virology.								
5.1	ARVI viruses - influenza, parainfluenza, SARS, rhino-, corona-, RS-, adenoviruses. Viruses of measles, mumps. Morphology, antigens, cultivation, pathogenesis and clinical features. Principles of laboratory diagnostics, treatment and prevention. /Lec/. /Лек/	3	2					
5.2	Microbiological diagnostics infections caused by viruses influenza, parainfluenza, adenovirus, rhinovirus, coronavirus, RS virus, mumps viruses, Cory. Preparations for etiotropic and specific therapy, General and specific prevention of this pathologies. /Pr/ /Пп/	3	2		0,5			
5.3	Enteroviruses - poliomyelitis viruses, Coxsackie, ECHO. Hepatitis viruses A,E,B,C,D. Morphology, antigens, cultivation, pathogenesis and clinical features. Principles of laboratory diagnostics, treatment and prevention. /Lec/. /Лек/	3	2					
5.4	Microbiological diagnostics infections caused by viruses polio, Coxsackie, ECHO. Diagnosis of viral hepatitis A and E. Drugs for etiotropic and specific therapy, General and specific prevention of this pathologies. /Pr/ /Пп/	3	2		0,5			
5.5	Viruses hepatitis A and E, b,C, and D. HIV – human immunodeficiency virus man's. Morphology, antigens, cultivation, features pathogenesis and clinics. Principles of laboratory diagnostics, treatment and prevention. /Pr/ /Пп/	3	2					

5.6	HIV — human immunodeficiency virus. Viruses of the family Herpesviridae — herpes viruses, varicella (chickenpox) virus, cytomegalovirus. Morphology, antigens, cultivation, features of pathogenesis and clinical manifestations. Principles of laboratory diagnosis, treatment, and prevention /Lec/. /Лек/	3	2						
5.7	Arbo - and rhabdoviruses – encephalitis and hemorrhagic fever. Virus rabieses. Morphology, antigens, cultivation, features pathogenesis and clinics. Principles of laboratory diagnostics, treatment and prevention. /Lec/ /Лек/	3	2						
5.8	Microbiological diagnostics arbovirus infections – encephalitis, hemorrhagic fevers'. Microbiological diagnosis of rubella, rabies. Preparations for etiologic and specific therapy, General and specific prevention of this pathologies. /Pr/ /Пр/	3	2						
5.9	Microbiological diagnostics herpesvirus infections and smallpox. Preparations for the specific and specific therapies. General and specific prevention this pathology./Pr/ /Пр/	3	2						
5.10	Microbiological diagnostics herpesvirus infections and smallpox. Preparations for the specific and specific therapies. General and specific prevention this pathology./Pr/ /Пр/	3	2						
5.11	Slow viral and prion diseases. Causes and characteristics diseases. Principles of diagnosis, treatment, prevention. Oncogenic viruses - DNA and RNA-genomic, classification. Mechanism viral oncogenesis. /Pr/ /Пр/	3	2						
5.12	Protozoal infections: etiology, ways of infection transmission, mechanisms of disease development, methods of laboratory diagnostics. Principles of therapy and prevention of general and specific /Pr/ /Пр/	3	2						
5.13	Colloquium №4. /Pr/. /Пр/	3	2						



5.14	The viruses of the Herpesviridae family – viruses of herpes, chickenpox, cytomegalovirus. Morphology, antigens, cultivation, peculiarities of pathogenesis and clinic. Principles of laboratory diagnostics, treatment and prevention. Viruses of slow infections. Prions and prion diseases. Oncogenic viruses. /Лec/ /Лec/	3	2					
5.15	Контактная работа Эж /КрЭж/	3	0,5					

5. ФОНД ОЦЕНОЧНЫХ СРЕДСТВ

5.1. Контрольные вопросы и задания

2 semester

CONTROL №1

ON THE MORPHOLOGY OF BACTERIA CONTROL QUESTIONS

1. The subject and tasks of microbiology, the main stages in the development of microbiology. Researches of Samoilovich, Pasteur, Koch, Mechnikov, Ivanovsky, Zilber, Zdrovovsky, Ermolyeva, Erlich, Borde.
2. Systematics and nomenclature of bacteria. Basic principles of classification of microorganisms. The concept of genus, species, subspecies, serovar, chemovar, fagovar.
3. What do microbiological terms mean: population, clone, strain?
4. Microscopic research methods. Microscopes: biological, luminescent, phase-contrast, electronic, ultramicroscope – their device, principle of operation. Immersion system.
5. The main forms of prokaryotes are cocci, rods, convoluted, filamentous.
6. Stages of preparing a smear from a culture of bacteria, sputum, blood, pus.
7. Tinctorial properties and staining methods of microorganisms (simple and complex)
8. Preparation of a smear from plaque and staining according to Burri.
9. Structure of a prokaryotic cell. Structures required and optional (inclusions), value, functions.
10. Nuclear apparatus of bacteria, plasmids, their role, structure.
11. Features of the structure of the cell wall of gram-positive and gram-negative bacteria.
12. Mechanism and stages of Gram staining. What color are cocci, rods, convoluted forms painted in and why?
13. Protozoa, spheroplasts, L-forms: formation conditions, significance.
14. Acid-resistant bacteria. The mechanism and stages of staining according to Ziehl-Neelsen. What causes bacteria acid resistance?
15. Capsule: structure, meaning, methods of detection. Draw bacteria that form a capsule constantly and only in the body.
16. Sporulation, conditions, stages. The difference between different types of spore-forming microbes. Spore detection, staining in a simple and complex way. Draw microbes that form spores.
17. Flagella in bacteria. Mobility and methods of study in preparations "crushed" and "hanging" drop. Draw the bacteria monotrichous, peritrichous, amphitrichous, lophotrichous.
18. Pili (fimbria), types, meaning.
19. Volutin grains: composition, value, coloring according to Leffler and Neisser. draw microbe
20. Morphology, features of the structure and reproduction of actinomycetes, mycoplasmas, chlamydia, spirochetes, rickettsiae.

3 semester.

COLLOQUIUM №1

ON PHYSIOLOGY, GENERAL VIROLOGY AND GENETICS OF MICROBES

CONTROL QUESTION

1. Action of physical, chemical factors on microorganisms. The concept of sterilization, disinfection, disinsection, deratization, antiseptics and aseptis.
2. Sterilization methods (physical, chemical, mechanical, biological) equipment, mode, control.
3. Ecology of microbes. The role of microbes in the cycle of substances in nature.
4. Microflora of air, water, soil, human body.
5. The importance of normal microflora for the human body and the maturation of the immune system.
6. Dysbacteriosis, factors contributing to its development.
7. Principles of correction microflora in dysbacteriosis, cubiotic preparations used for recovery normal human microflora in dysbacteriosis.
8. Nutrition of bacteria. Mechanisms, classification of bacteria by types of nutrition.
9. Nutrient media, classification. nutrient requirements.
10. The principle of preparation of basic nutrient media.
11. Technique of sowing and reseeded of microbes.
12. Thermostat, thermostats. Principle of operation.
13. Temperature limits of growth: thermophiles, psychrophiles and mesophiles.
14. Growth and reproduction of bacteria. Phases of bacterial reproduction on liquid nutrient media. Microbial colonies, their characteristics, colony counting.

15. Breathing microbes. Classification of microbes by types of respiration: aerobes, obligate and facultative anaerobes, microaerophiles, aerotolerants.
16. Methods for isolating pure cultures of aerobes: mechanical, physical, chemical, biological.
17. Methods for creating anaerobic conditions.
18. Bacterial enzymes. Their classification. Enzymatic activity of microbes and its use for identification bacteria.
19. Carbohydrate metabolism in bacteria, its significance. Environments of Giss, Endo, Levin, Ploskirev, Ressel, etc. for bacterial differentiation.
20. Protein metabolism in bacteria, its study and significance for bacterial differentiation.
21. Pigments of bacteria, their role, conditions of formation, classification.
22. Viruses. Classification, structure size.
23. Signs of the uniqueness of viruses, their difference from bacteria.
24. Types of interaction of the virus with the cell: infection, integration, virogeny.
25. Types of tissue cultures of cells, classification. Methods for preparing and growing cell cultures.
26. Cultivation of viruses and methods of their indication on the chick embryo and in cell culture.
27. Bacteriophages: virulent, moderate, prophages, defective. Structure, interaction with a bacterial cell, properties, obtaining, application, obtaining.
28. Bacterial genetics. Genotype and phenotype. Types of variability: phenotypic and genotypic. Modifications dissociation, mutation. Classification of mutations by origin, by mechanism.
29. Physical, chemical, biological mutagens.
30. Genetic recombinations: transformation, transduction, conjugation.
31. Plasmids. Their properties and functions.
32. Movable genetic elements: transposons, IS-sequences and their role.
33. The concept of genetic engineering and biotechnology.
34. Molecular genetic research method – PCR. The principle of setting, practical significance.
35. Microbial antagonism.
36. Antibiotics, sources of their production.
37. Classification of antibiotics by origin, mechanism and spectrum of action.
38. Principles of rational antibiotic therapy, possible complications, side effects.
39. Main mechanisms of formation of microbial resistance to antibiotics and preventive measures.
40. Methods for determining the sensitivity of bacteria to antibiotics.

COLLOQUIUM No. 2

FOR INFECTION, COCCIAL AND AIR DROPLET INFECTIONS

CONTROL QUESTIONS

1. The concept of infection and the infectious process. Conditions for the occurrence of an infectious process.
2. Stages of development and characteristic signs of an infectious disease.
3. Forms of infections. The concept of bacteremia, toxemia, sepsis, septicytemia.
4. Pathogenicity and virulence of bacteria. Pathogenicity factors. Units of measurement of bacterial virulence.
5. Toxins of bacteria, their nature, properties, obtaining.
6. Anatoxins. Receipt. Titration. Application.
7. The role of the environment and the social factor in the development of the infectious process.
8. Staphylococci. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Microbiological diagnosis of diseases caused by staphylococci. Specific prevention and treatment.
9. Streptococci. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Microbiological diagnosis of streptococcal infections. Treatment and prevention.
10. Pneumococci. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Forms of infection. Microbiological diagnostics. Treatment and prevention.
11. Meningococci. Taxonomy. Characteristic. Forms of infection. Microbiological diagnostics. Treatment and prevention.
12. Gonococci. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Microbiological diagnostics of gonorrhea, blennorrhoea. Treatment and prevention.
13. Gardnerella. Morphological, biological properties: Laboratory diagnostics. Treatment and prevention.
14. Chlamydia, their biological properties, cultivation, role in human pathology, principles of laboratory diagnosis of diseases, treatment, prevention.
15. Mycoplasmas, their biological properties, cultivation, role in human pathology, principles of laboratory diagnosis of diseases, treatment, prevention.
16. Pathogens of diphtheria. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Conditionally pathogenic corynebacteria. Microbiological diagnosis of diphtheria. Detection of antitoxic immunity.
17. Pneumococci. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Forms of infection. Microbiological diagnostics. Treatment and prevention.
18. Tuberculosis pathogens, classification of mycobacteria. Taxonomy. Characteristic Sources, transmission routes infections. Pathogenesis. Microbiological diagnosis of tuberculosis. Specific prevention and treatment.
19. Mycobacterium leprosy. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Forms of infection. Microbiological diagnostics. Treatment and prevention.
20. Actinomycetes. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis. Microbiological diagnostics. Specific prevention and treatment.

3 SEMESTER

CONTROL NUMBER 2

ON INTESTINAL INFECTIONS

CONTROL QUESTIONS

1. Causative agents of coli infections. Taxonomy. Characteristic. The role of Escherichia coli in normal and pathological conditions. Sources infections, transmission routes. Pathogenesis. Microbiological diagnosis of coli infections. Treatment, prevention.
2. Pathogens of shigellosis. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnostics. Specific prevention and treatment.
3. Causative agents of typhoid and paratyphoid. Taxonomy and characteristics. Sources of infection, routes of transmission, pathogenesis. Microbiological diagnostics. Specific prevention and treatment.
4. Pathogens of salmonellosis. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnosis of salmonellosis. Treatment, prevention.
5. Causative agents of cholera. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnostics, treatment, prevention.
6. Causative agents of intestinal yersiniosis. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnostics. Treatment, prevention.
7. Causative agents of proteus infection. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnostics. Treatment, prevention.
8. Causative agents of Klebsiella infection. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnostics. Treatment, prevention.
9. Pseudomonas aeruginosa infection. Taxonomy. Characteristic. Sources infections, transmission routes, pathogenesis. Microbiological diagnostics. Treatment, prevention.
10. Campylobacter. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological enteritis diagnosis. Treatment, prevention.
11. Helicobacteria. Taxonomy. Characteristic. Sources of infection, transmission routes, pathogenesis. Microbiological diagnosis of gastric and duodenal ulcers. Treatment, prevention.

COLLOQUIUM No.3**ON ANAEROBIC, ZONONOSIS, SPIROCHETOSIS, RICKETTSIOSIC INFECTIONS****CONTROL QUESTIONS**

1. Causative agents of anaerobic gas infection. Taxonomy. Characteristic. Sources of the route of transmission of infection, pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
2. The causative agents of tetanus. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics and treatment.
3. Causative agents of botulism. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
4. Plague pathogens. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
5. Tularemia pathogens. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
6. Pathogens of anthrax. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
7. Causative agents of brucellosis. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
8. Features of microbiological diagnostics in quarantine infections. Express diagnostics.
9. Causative agents of syphilis. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics. Treatment and prevention.
10. Pathogens of epidemic and endemic relapsing fever, their properties, characteristics. Disease pathogenesis, laboratory diagnostics, specific prevention and treatment.
11. Causative agents of leptospirosis. Taxonomy. Characteristic. Microbiological diagnostics. Treatment and prevention.
12. Pathogens of epidemic and endemic typhus. Taxonomy. Characteristics, pathogenesis of diseases. Brill-Zinsser disease. Microbiological diagnostics. Specific prevention and treatment.
13. The causative agent of Q fever. Taxonomy. Characteristic. Sources of the route of transmission of infection, the pathogenesis of the disease. Microbiological diagnostics, prevention and treatment.

COLLOQUIUM No.4**FOR VIRAL INFECTIONS****CONTROL QUESTIONS**

1. The significance of the discovery of viruses by D.I. Ivanovsky. Stages of development of virology. The role of domestic scientists in the development virology.
2. ARVI pathogens. Taxonomy. Characteristic. Sources, ways of transmission of infection.
3. Influenza viruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease, clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
4. Parainfluenza viruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
5. Measles virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease, clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
6. Parotitis virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
7. Respiratory syncytial virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis diseases, clinical manifestations. Microbiological diagnostics, treatment, prevention.
8. Adenoviruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease, clinical manifestations. Microbiological diagnostics, treatment, prevention.

9. Coronaviruses. SARS virus - severe acute respiratory syndrome (SARS). Taxonomy. Characteristic. Sources, ways of transmission of infection. Microbiological diagnostics. Specific prevention and treatment.
10. Coxsackie enteroviruses, ECHO. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis diseases, clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
11. Poliomyelitis viruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease clinical manifestations. Microbiological diagnostics. Specific prevention and treatment.
12. Hepatitis viruses A, B, C, D, E. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis diseases, the main clinical manifestations. Microbiological diagnostics. Specific prevention, treatment.
13. Arboviruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of diseases. Are common principles of microbiological diagnosis of arbovirus infections. Fundamentals of specific prevention and treatment.
14. Yellow fever viruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
15. Mosquito fever virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. Pathogenesis diseases. Microbiological diagnostics. Specific prevention and treatment.
16. Dengue fever virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
17. Tick-borne, Japanese encephalitis viruses. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
18. Virus of Omsk hemorrhagic fever. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
19. Crimean hemorrhagic fever virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
20. Hemorrhagic fever virus with renal syndrome. Taxonomy. Characteristic. Sources, transmission routes infections. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
21. Rabies virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prophylaxis.
22. Smallpox virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention of smallpox at the present stage.
23. Rubella virus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
24. Herpes virus infection - herpes simplex virus 1, 2: taxonomy, characteristics of pathogens. Sources, paths transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
25. Varicella zoster virus and shingles. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
26. Cytomegalovirus. Taxonomy. Characteristic. Sources, ways of transmission of infection. The pathogenesis of the disease. Microbiological diagnostics. Specific prevention and treatment.
27. Epstein-Barr virus. Taxonomy. Characteristics of pathogens. Sources, ways of transmission of infection. Pathogenesis diseases. Pathogenesis of diseases, main clinical manifestations. Microbiological diagnostics. Prevention and treatment.
28. HIV infection. Taxonomy, characteristics of the pathogen. Sources, ways of transmission of infection. Pathogenesis diseases, clinical manifestations. Microbiological diagnostics, prevention.
29. Classification and characteristics of oncogenic RNA and DNA viruses. The mechanism of oncogenesis.
30. Viruses of slow infections. Characteristics of pathogens. Mechanism of development and forms of manifestation. Principle laboratory diagnostics.
31. Prion diseases. Etiology, pathogenesis, forms of manifestation. Principles of treatment and prevention.

5.2. Темы курсовых работ (проектов)

the course work is not provided for by the discipline plan

5.3. Фонд оценочных средств

EXAMPLES OF TEST TASKS

1. The shape of the bacterial cell is determined by the structure:
1. Cytoplasmic membrane 2. Capsid 3. Capsules 4. Disputes 5. Cell wall
2. Indication of viruses in laboratory animals:
1. Color sample 2. The formation of plaques 3. The characteristic clinic and the formation of intracellular inclusions 4. PCR 5. IFA
3. The presence of the cell wall determine:
1. Luminescent microscopy 2. Method "crushed drop" 3. Method "thick drop"
4. The ultracentrifuge forces 5. Plasmolysis
4. For the elective environments are:
1. Blood agar 2. Mastopathy agar 3. Yolk-salt agar 4. Mastopathy broth 5. Whey agar
5. Pathogenicity is the potential ability of microbes:
1. Shaping the immune system 2. To be lysed by phages 3. To ferment the carbohydrates 4. To cause infection 5. Split proteins
6. Immuno-biological preparations for the creation of active artificial immunity:
1. Immunoglobulin 2. Hyperimmune serum 3. Vaccine 4. Adjuvants 5. Interferon
7. Meningococci are characterized by:
1. Mobility 2. The sporulation 3. Gram-positive colouring 4. Intracellular arrangement 5. Anaerobic type of respiration



8. To establish the source of nosocomial staphylococcal infection produce:
 1. Isolation of Staphylococcus aureus from relatives 2. The phage typing 3. Determination of enzymatic activity
 4. Determination of toxicity 5. Determination of pathogenicity enzymes
 9. Signs of differentiation of conditionally pathogenic and enteropathogenic Escherichia:
 1. Morphological features 2. Biochemical activity 3. Antigenic structure 4. Cultural properties
 5. Type of gram staining
 10. For the prevention of tetanus is investigated:
 1. Suture and dressing material 2. Blood 3. The preserved products 4. Bowel movements 5. CSF
 11. Specificity of interaction of the virus with the cell :
 1. Connected with the symmetry of the virus 2. Depends on the number of capocitors 3. Related to complementarity of receptors
 4. Depends on the type of nucleic acid 5. Linked to lack velocimetry systems
 12. For emergency prevention of tick-borne encephalitis is used:
 1. The serum 2. Killed vaccine 3. Immunglobulin 4. Interferon 5. Antibiotics
 13. Omsk hemorrhagic fever is an infection:
 1. Intestinal 2. Natural step 3. Wound 4. Antropologia 5. Anthrozoonosis
 14. What diseases are not marker manifestations of HIV infection:
 1. Candidiasis of the esophagus 2. Kaposi's Sarcoma 3. Lymphadenopathy 4. Cytomeglovirus infection 5. Hemophilia
 15. For the ELISA to detect antibodies against HIV antigens are used:
 1. Isolated from the membranes of the chicken embryo 2. Obtained by hybridization 3. Adsorbed on solid-phase carrier 4. Suspended in physiological solution 5. Obtained with formalin and high temperatures

EXAMPLES OF SITUATIONAL TASKS

1. At the Institute of vaccines and sera it is necessary to obtain agglutinating polyvalent and monovalent abdominal sera. What is necessary for this? How to get agglutinating serum?
 2. Delivered wound separated from the patient M., 23 years. Diagnosis: a suspicion of anaerobic infection. When sowing material on the environment Kitt-Tarozzi marked turbidity and the turbulent gas environment. Describe the further course researches.
 3. Child M., 6 months. Complaints (according to mother) to frequent regurgitation, vomiting, frequent loose stools, weight loss. When sowing feces on the Endo medium colonies planted red. On the Ressel medium-change the color of the entire medium, the formation of gas. How should the analysis be continued? What kind of disease can be a speech?
 4. Dedicated blood culture on the 8th day of replanting with liver broth liver agar. Colonies small, round, convex, colorless with mother-of-pearl hue. In a smear of colonies of small gram-negative rods. At identification of pure culture noted the following: a) growth with increased concentrations of carbon dioxide, b) forms a hydrogen, C) grows on media with the addition of fuchsin and does not grow on media with thionine, d) lacked phage TB, d) carbohydrates are not fermented, e) agglutinated specific minoritarymyi serums. Make a conclusion on the results of the analysis.
 5. Patient S., 27 years. Three days ago he returned from Omsk region, where he worked in logging. Complaints of fever with chills, bleeding, hemorrhagic rash. What is your diagnosis supposed to be? What laboratory tests need to apply to clarify the diagnosis of the disease?

THEMES OF ABSTRACTS, REPORTS, ROUND TABLES:

Modern methods of rapid diagnostics in medical Microbiology.

Evolution of microbes.

Ways to overcome drug resistance in microbes.

Restrictions on the use of drugs in pregnant women and children.

Microflora of the human body throughout life and its role in normal physiological processes and in pathologies.

Microflora of air, water, soil and its impact on the human body.

Obtaining new antimicrobials by methods of genetic engineering.

Getting vaccines, bacteriophages, mycophages with the help of biotechnology.

Genetic engineering and application of its achievements in human life and medical Microbiology.

Types of symbioses between different organisms.

Features of antibacterial immunity.

Features of antiviral immunity.

Features of antifungal immunity.

Features of antiparasitic immunity.

Autoimmune disease.

Autoantigens.

The role of staphylococci in the development of generalized processes in children of the first year of life. Iyell syndrome.

The role of streptococci in the development of immune inflammation of the connective tissue, in the development of rheumatism.

Classification of mycobacteria.

Pathogens of keratomycosis (epidermophytosis, microsporia, trichophytosis). morphological and biological properties, diagnosis, treatment and prevention.

Pathogens of dermatomycosis-types, morphological and biological properties, diagnosis, treatment and prevention.

Pathogens of subcutaneous mycoses (sporotrichosis, mycetoma), morphological and biological properties, diagnostics, treatment and prevention.

The causative agents of visceral deep mycoses (histoplasmosis, coccidioidomycosis, cryptococcosis), morphological and biological properties, diagnosis, treatment and prevention.

The role of E. coli in the pathology of children of the first year of life.
 The role of Proteus and klebsiell in human pathology.
 Especially dangerous (OOI) and quarantine infections: characteristics, properties of microbes – criteria for the selection of pathogens highly dangerous infections, principles of diagnostics. Events in the focus of OOI.
 The modern classification of rickettsiosis disease.
 The virus of atypical pneumonia, role in human pathology. Laboratory diagnostics, therapy and prevention.
 The viruses of foot and mouth disease. Pathogenesis. Laboratory diagnostics, therapy and prevention.
 The principles of therapy and prevention of HIV infection and AIDS. Difficulties in the development of drugs for the treatment and preventions. Congenital HIV infection.
 ebola virus. Pathogenesis. Laboratory diagnostics. Therapy and prevention.
 HTLV – human T-lymphotropic viruses. Pathogenesis. Laboratory diagnostics. Therapy and prevention.
 Toxoplasms. Views. Pathogenesis. Diagnostics. Therapy and prevention. Teratogenic effect of microbes on fruit.
 The malaria Plasmodium. Views. Development cycle. Pathogenesis. Diagnostics. Therapy and prevention.
 Leishmanias. Views. Pathogenesis. Diagnostics. Therapy and prevention.
 Lamblias. Pathogenesis. Diagnostics. Therapy and prevention.
 Amoebae. Views. Pathogenesis. Diagnostics. Therapy and prevention.
 Trichomonas. Views. Pathogenesis. Diagnostics. Therapy and prevention.
 Dysbacteriosis. The factors influencing its formation. Diagnostics. Treatment and prevention.
 Opportunistic infection: an etiological factor, the mechanism of disease development, diagnostics, principles of treatment and prevention.
 Childhood viral infections. Features of antiviral immunity. Difficulties in the development of drugs for antiviral therapy.

5.4. Перечень видов оценочных средств

Test
 Colloquium
 Interview
 Presentation report
 SCALE OF EVALUATION TESTS
 Section "" - 20 questions in the variant-the maximum number of 20 points;
 correct answer to 1 question- 1 point:
 19-20 points-5;
 17-18 points-4;
 14-16 points – 3.
 Section "" - 15 questions in option -maximum 15 points;
 the correct answer to 1 question – 1 point):
 15 points – 5;
 14 points – 4;
 13 points– 3.
 Section "" 10 questions in the variant-the maximum number of 10 points; correct answer to 1 question –1 point:
 10 points-5;
 8-9 points-4;
 6-7 points– 3.
 SCALE OF EVALUATION WORKSHOPS
 Section – "" - in the ticket 5 questions, 1 question-the maximum number of 5points):
 22-25 points – 5;
 18-21 points – 4;
 15-17 points – 3.
 Section – "" - in the ticket 3 questions, 1 question-the maximum number of 3 points:
 9 points-5;
 7.5points-4;
 6 points-3.
 SCALE OF EVALUATION INTERVIEWSSection"": in the ticket 5 questions, 1 question-the maximum number of 6 points:
 28-30 points-5;
 24-27points – 4;
 20-23 score – 3.
 Section"": in the ticket 5 questions, 1 question-the maximum number of 5the score 22-25 points – 5; 18-21 points– 4; 15-17 points– 3.
 Annex 1 SCALE OF ASSESSMENT OF RESULTS OF INTERMEDIATE CERTIFICATION. During a semester work on practical occupations (the current control), delivery of control points (boundary control) graded by the teacher conducting the class, and scores are recorded in the sheet, available for viewing.

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The maximum number of points -100. For each control point, the student must collect the number of points not less than the minimum. The final grade is determined based on the summation of a semester and test scores. The exam is held in oral, written, textual form. To obtain a positive assessment in the exam, the student must dial not less than half of the set amount of exam points, i.e. 10 points. Example of calculation: semester points: semester I – 70, in the second semester – 80 on the exam – not less than 15. Means (70+80):2=15=90 points, i.e. "excellent". A scale score for determining the final:
 ≥ 85balls - " excellent"
 < 85 points - " goods"
 < 70 points - " satisfactory"
 < 60 points - " unsatisfactory"

6. УЧЕБНО-МЕТОДИЧЕСКОЕ И ИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)	
6.1. Рекомендуемая литература	
6.3. Перечень информационных и образовательных технологий	
6.3.1 Компетентностно-ориентированные образовательные технологии	
6.3.1.1	Traditional educational technologies: lectures, practical exercises, laboratory works
6.3.1.2	reconstructive type, focused on the communication of knowledge and methods of action transmitted to students in
6.3.1.3	ready and intended for assimilation. Lecturing involves the use of multimedia
6.3.1.4	equipments. Practical training with the use of tables, stands, visual AIDS.
6.3.1.5	Innovative educational technologies: role-playing games, specific analysis
6.3.1.6	situations, preparation of reports by students with presentations on given topics.
6.3.1.7	Information and educational technology: use by students of computer
6.3.1.8	technology and Internet resources. View educational videos.
6.3.2 Перечень информационных справочных систем и программного обеспечения	
6.3.2.1	1. МедУнивер- медицинский информационный портал http://meduniver.com/Medical/Microbiology/
6.3.2.2	2. Электронный атлас микроорганизмов http://vmcde.org/index.php?topic=2480
6.3.2.3	3. Информационная система «Единое окно доступа к образовательным ресурсам» http://window.edu.ru/
6.3.2.4	www.med-edu.ru/articles .

7. МАТЕРИАЛЬНО-ТЕХНИЧЕСКОЕ ОБЕСПЕЧЕНИЕ ДИСЦИПЛИНЫ (МОДУЛЯ)	
7.1	The department is located at the medical center in the Alamudin-1 district. The classrooms are equipped with teaching boards, charts, and micropreparations related to the topics of practical classes. There is an autoclave room, a materials room, and two assistants' rooms.
7.2	Medical-technical equipment and its use:
7.3	Microscopes – for studying the morphological features of microbes and mastering the bacterioscopic research method;
7.4	Autoclave – for sterilizing laboratory glassware, nutrient media, and physiological solutions, for disinfecting biological material, and studied cultures of infectious disease pathogens;
7.5	Drying oven – for sterilizing laboratory glassware;
7.6	Distiller and thermostat – for bacterial cultivation.
7.7	The department has an electronic library, which is periodically updated with new textbooks and teaching aids, including materials developed by the department staff.
7.8	The department actively uses multimedia equipment (computer and notebook, projector) for creating lectures in PowerPoint, preparing reports and educational programs, demonstrating lecture materials, presenting current topics of practical classes, and searching for information when preparing independent work.
7.9	Visual aids for demonstrating microbiology topics include smears for microscopic examination, Petri dishes with microbial growth, bacterial preparations, vaccines, therapeutic and diagnostic sera, disinfectants, insecticides, rodenticides, and instruments for disinfection, as well as tables (including self-made tables) and a collection of other didactic materials in the form of portfolios on various topics, which is constantly updated with new materials developed by both faculty and students.
7.10	Computer labs with Internet access for independent work, accessing online resources, and viewing video materials are located in Building 12.

8. МЕТОДИЧЕСКИЕ УКАЗАНИЯ ДЛЯ ОБУЧАЮЩИХСЯ ПО ОСВОЕНИЮ ДИСЦИПЛИНЫ (МОДУЛЯ)	
ADVICE ON PLANNING AND ORGANIZING TIME FOR STUDYING THE DISCIPLINE	
1. Recommended organization of study time	
Reviewing lecture notes the day before practical classes – 15–20 minutes.	
Studying theoretical material from the textbook and notes – 1 hour per week.	
Preparing for practical classes – 2 hours.	
2. Sequencing of student actions	

To understand and properly assimilate the material, the following sequence is recommended:

After attending a lecture, when preparing for the next day, first review and reflect on the lecture text studied today (10–15 minutes). While preparing for the next lecture, review the previous lecture and think about what the topic of the next lecture might be (5–10 minutes).

During the week, allocate 1 hour for working with recommended literature in the library.

When preparing for practical classes the next day, first read the key concepts and approaches on the topic of the homework.

When performing exercises or tasks, first understand what is required, which theoretical material to use, and outline a plan for solving the task.

3. Recommendations for using teaching materials

It is recommended to use the methodical guidelines for the course and the lecturer's notes.

4. Recommendations for working with literature

The theoretical material becomes clearer when, in addition to lectures and notes, students also study books.

It is easier to master the course by sticking to one textbook and lecture notes.

Besides memorizing, aim for understanding the topic.

After studying a paragraph, perform several simple exercises on the topic.

Mentally ask yourself:

What is this paragraph about?

What new concepts are introduced, and what do they mean?

How can this be applied in practice?

5. Advice for preparing for current assessments

In addition to studying lecture notes, use the textbook.

Aim for understanding, not just memorization.

Mentally ask yourself the same reflective questions as above.

For interim assessments, study the theory (definitions of all concepts and evaluation approaches) until it is fully understood, and independently solve situational tasks for each topic.

When solving tasks, always develop an action algorithm and correctly interpret the results.

6. Guidelines for completing homework

First, read the key concepts and approaches related to the assignment.

Understand which theoretical material to use.

Outline a plan for solving the task, then complete it and make a quality conclusion.

7. Makeup for missed classes

Student progress is systematically monitored by the department and recorded in the teacher's journal and scores.

Students receiving unsatisfactory marks must prepare the relevant section and report to the lecturer individually.

A lecture missed without valid reasons must be made up either by oral questioning or by preparing a report based on the missed lecture within 10 days.

Other methods may also be used (questions during practical classes, test control, etc.).

Every missed class without valid reasons must be made up.

Make-up sessions are conducted according to the department schedule, agreed with the dean's office.

Missed classes must be made up within 10 days.

Students may make up no more than one class per day if missed without a valid reason.

Classes missed for valid reasons (illness, dean-approved absences) are made up according to the thematic material without regard to hours.

Students who fail to make up the missed class on time are allowed to attend subsequent classes only with written permission from the dean or deputy dean.

Students weakly prepared for a seminar are not allowed to skip makeup work.

Students who miss seminars due to prolonged illness must follow an individual schedule approved by the dean and department.

In exceptional cases (participation in inter-university conferences, competitions, duty, etc.), the dean or deputy, in agreement with the department, may exempt students from making up certain missed classes.

STUDENT PERFORMANCE ASSESSMENT

1. Current Assessment

Assesses students' mastery of the study material during classroom activities (lectures, practical classes), including attendance and participation, as well as completion of mandatory independent assignments.

2. Milestone Assessment

Checks the completeness of knowledge and skills on the material of a module as a whole.

Module control tasks are conducted in written form, as tests, or oral questioning and are a mandatory component of the module assessment.

3. Interim Assessment

Represents a completed documented part of the discipline:

3rd semester – credit

4th semester – exam

Consists of closely related credit modules.

When attending a credit or exam, students must have their grade books, which they present to the teacher or examiner at the beginning.

The teacher may award a credit without questioning to students who have scored more than 60 points on milestone assessments and, at the end of the course, on current assessments.

During the interim assessment, the student must:

Correctly answer theoretical questions from the ticket (knowledge)

Properly solve situational tasks (skills and mastery)

Interim assessment score: minimum 20 points – maximum 30 points.

INDEPENDENT STUDENT WORK IN STUDYING THE DISCIPLINE

1. Recommended sequence of actions for mastering the material

When preparing for a practical class, the student should review the methodical materials for the upcoming session (posted on the department stand).

Repeat necessary material from previous topics related to the current topic.

In lecture notes, main and additional literature, find answers to self-study questions.

In the workbook, complete written homework: make a summary, draw a diagram of laboratory diagnostics of an infectious disease.

2. Preparation for tests

Use lecture materials and read both the main and additional literature.

3. Preparation for colloquiums and oral questioning

Review the list of questions.

Repeat the studied material.

In addition to memorizing, it is essential to achieve a deep understanding of the discipline topics.

4. Preparation for interim assessment

Review exam questions in advance.

Know the theoretical material according to the exam questions.

Be able to draw schemes for laboratory diagnostics.

Master microbiological diagnostic methods.

5. Recommendations for writing a term paper

The topic is chosen in agreement with the lecturer.

The term paper should be based on several additional sources in addition to the main literature (usually special monographs or articles).

Additional sources may include popular science journals such as: "Vestnik KRSU", "Healthcare of Kyrgyzstan", "Vestnik KGMA", and newspapers focused on medical topics.

The plan of the term paper must be the author's own. It should reflect the author's approach, opinion, and problem analysis.

All facts and borrowed ideas must include references.

Simply copying text fragments is not allowed.

All quotations must be in quotation marks with the source and page number in parentheses. Lack of quotes or references is plagiarism and is considered a violation of copyright according to scientific ethics.

6. Format of the term paper

The term paper is typed on A4 sheets.

Start with a title page, including:

University name

Course name

Term paper topic

Student's name and initials

Academic group number

Year and geographic location of the university

Then provide a table of contents with page numbers.

The main text should be divided into chapters and subchapters, each with a title.

Use quantitative data and illustrations where possible (graphs, tables, charts, figures).

Conclude with "Conclusion" and "References" sections.

The Conclusion should present the main findings, clearly formulated and numbered.

7. References

Must comply with current bibliographic standards, including proper punctuation.

Example formats:

Book: Author I.O. Title of the book. Place of publication: Publisher, Year. Total pages.

Journal article: Author I.O. Title of the article // Journal Name. Year. Volume. №. Pages from... to...

Collection article: Author I.O. Title of the article / Title of the collection. Place of publication: Publisher, Year. Pages from... to...

For guidance, you can use examples from books published by major scientific publishers such as: GEOTAR-Media, Progress, Mir, MSU Publishing House, etc.

PREPARATION OF A REPORT FOR A CLASS

Main stages of preparing a report for a class

Choosing a topic.

Consulting the lecturer.

Preparing a report plan.

Working with literature sources.

Collecting material.

Writing the report text and preparing a presentation.

Formatting the manuscript and submitting it to the lecturer before the report, which determines the student's readiness to present.

Delivering the report and answering questions.

Recommendations for preparing a report with a presentation

Students must prepare and present the report within the time allocated by the lecturer.

Instructions for presenters:

Present new information

Use technical tools

Be knowledgeable and well-oriented in the topic of the presentation
Be able to discuss and answer questions quickly
Follow the established schedule: Report – 10 min; Discussion – 5 min
The presentation should have three parts: introduction, main part, and conclusion.
Introduction should include:
Presentation title
Main idea
Current evaluation of the topic
Brief overview of the questions considered
Engaging and lively style
Main part:
Deeply reveal the topic
Present sufficient data to interest the audience
Use visual aids and audio-visual materials; do not rely only on theoretical structure
Conclusion:
Clear and concise summary
Brief findings MULTIMEDIA PRESENTATIONS
A form of independent student work to create visual informational aids using PowerPoint.
Develops skills in:
Collecting, systematizing, and processing information
Creating electronic materials summarizing main issues
Computer literacy
Presentations are prepared in the form of slides using Microsoft PowerPoint.
Students must prepare and defend the presentation as a report.
Presentation structure
First slide:
Title of the presentation
Authors' names
University logo, course name, year, group
Second slide: Plan of the presentation
Last slide:
Conclusions
References (including Internet resources)
Design recommendations
Contrast: Use dark background (dark blue or black) with white or yellow text.
Avoid light-colored text on light backgrounds; colors appear brighter on computer screens but fade on projection.
Text slides:
Be concise; break content into bullet points
Each point: max 5–8 words (without prepositions)
Slides should not be overloaded
Font size: Use 28 pt or larger. Smaller text is hard to read; 75% of adults have vision defects, many of whom do not wear glasses.
Digital material: Use charts and diagrams (bar or pie charts), preferably created in Excel and transferred to PowerPoint.
Presentation length and flow
Optimal size: 8–20 slides
Too many slides distract the audience
Focus on key points; details should be explained orally
Slide transitions should be evenly paced
Visual variety
Combine text slides, two-column slides, images with text, diagrams
Include photos, portraits, biographical info, cartoons, humorous images
Use ready-made templates for colorful, engaging slides.