International School of Medicine
Department of "Fundamental disciplines"

SYLLABUS

"Microbiology, Virology and Immunology"

main educational program
in the specialty General Medicine (for foreign citizens)

graduate qualification: general practitioner

Full-time education

Well	
Semester	4
Credit / Exam (semester)	exam
Total Curriculum Credits	5
Total curriculum hours	150

Bishkek 2022

1. The work program of the academic discipline

1.1. Explanatory note

Mission of ISM IUK - training of competent specialists in the field of medicine, corresponding to international standards and traditions of medical ethics, ready for continuous professional growth using modern achievements of science and practice, to solve public health problems.

Annotation of the academic discipline

Microbiology is a science that studies the smallest living organisms invisible to the naked eye.

- studies the structure (morphology), metabolism and other physiological functions of microorganisms, their systematic position, distribution, role in nature and in human life.

The purpose of the discipline is to help the student in the ability to determine the types of microorganisms, their properties and functions in order to make correct diagnoses in the future, prescribe treatments and indicate preventive measures.

Discipline objectives:

1. formation of students' general ideas about the structure and functioning of microbes as living systems, their role in ecology and decontamination methods, including the basics of disinfection and sterilization techniques;
2. familiarization of students with the principles of organization of work in the microbiological laboratory, with measures for occupational safety and health.
3. teaching students methods of preventive measures to prevent bacterial, fungal, parasitic and viral diseases;

Place of discipline in the structure of OOP (prerequisites, postrequisites)

Prerequisites

For its successful assimilation, input knowledge, skills and competencies obtained by students during the passage of a number of disciplines in previous courses are necessary: biology, biological chemistry, human anatomy, histology.

Post-quisites.

In the future, the knowledge gained during the study of the discipline "Microbiology immunology and virology" will be necessary in the study of other theoretical and clinical disciplines, clinical microbiology and immunology, etc. Mastering the discipline: "Microbiology, virology and immunology" is: assisting students in mastering theoretical questions about the diversity of the world of microorganisms, their role in human pathology, the theoretical foundations of microbiological, molecular biological and immunological diagnostics of infectious diseases, diagnostics, practical skills in prevention methods and the main directions of treatment of infectious and opportunistic human diseases.

The block "Microbiology, virology and immunology" is included in the professional cycle in the basic part of the curriculum of the EUP UNPC "MUK" MSM for the specialty " General practitioner " (code 560001).

Professional competencies of students, formed as a result of mastering the discipline, the planned results of mastering the discipline

Code	Content of competence
PK-1	Ability and readiness to implement a set of activities, health promotion and preservation of health, development of a healthy lifestyle, prevention of (or) The spread of diseases, their early diagnosis, detection and the conditions for their emergence and development, as well as elimination of harmful effects on human health habitation
PK-3	Ability and preparedness to respond to epidemics Protection of the population in hot spots Diseases, when radiation conditions deteriorate, natural disasters
PK-4	Ability and readiness to use socio-hygienic Methods of collection and medico-statistical analysis of information on health indicators
LR1	the ability to analyze socially significant problems, solve professional problems using basic natural science, mathematical and humanitarian concepts and methods in various activities.
LR6	the ability to learn throughout life and apply basic knowledge in the field of fundamental disciplines in professional activities for the timely diagnosis and choice of treatment tactics.
LR12	possess the skills of solving strategic tasks for conducting research and innovative professional activities based on the principles of evidence based medicine for the development and implementation of new methods and technologies in the field of healthcare.

After mastering the discipline " Microbiology, virology and immunology " student:
Will know:
− the history of microbiology, virology, the main stages of the formation of these sciences;
− safety regulations and work in microbiological laboratories with reagents and devices, laboratory animals;
− classification, morphology and physiology of microbes and viruses, their morphological, biological and pathogenic properties, impact on public health;

− features of the formation of the processes of symbiosis of the human body with microbes, the role of microbes, the role of resistant microflora of the body in the development of opportunistic diseases;
− features of genetic control of pathogenicity and antibiotic resistance of microbes, mechanisms of resistance development and methods of its determination;
− the role of individual representatives of the microbial world in the etiology and pathogenesis of major human infectious diseases;
− methods of microbiological diagnostics, the use of basic antibacterial, antiviral and biological drugs, the principle of their preparation and application;
Will understand:
-how to distinguish the main types of microorganisms from each other;
- how the system of microorganisms and their vital activity is arranged;
- what the human immune system is;
-the importance of compliance with safety regulations and rules for handling material that poses a biological hazard
Will be able to use:
- microbiological equipment;
-chemical substances in staining techniques;
-acquired knowledge in the appointment and choice of methods of treatment and prevention of various diseases;
Will be able to carry out:
-various methods of cultivation and isolation of pure cultures of microorganisms;
- techniques for staining microorganisms in the laboratory (by Gram);
-practical work with magnifying equipment (microscopes, stereo and simple magnifiers),
- interpretation of microscopy data;
- selection of antimicrobial and immunobiological drugs for adequate prevention and treatment of infectious and non-communicable diseases;
Will be able to analyze:
-the processes of the course of various diseases caused by microorganisms;
- the effect of medicines, antibiotics and immunological preparations on the totality of their properties and the possibility of their use for the therapeutic treatment of patients of different

ages;
- prevention of various diseases;
Will be able to evaluate :
-Severity and outcomes of diseases of various nosologies.

1.2. Recommended educational technologies

The following educational technologies are used to master the students of the discipline "Microbiology, Virology and Immunology", gain knowledge and form professional competencies:
- lecture-visualization (LV)
-seminars using an interactive whiteboard and atlases (WB/A)
- analysis of clinical cases,(CC)
-participation in scientific and practical conferences,(S/PC)
-preparation of written analytical papers,(AP)
- preparation and defense of abstracts, reports, essays and presentations,(E/P)
- classes in the microbiological laboratory.(LW)

1.3. The scope of the discipline and types of educational work

According to the curriculum 2019	**4 sem.**	**Total**	
		in hours	**in credits**
Total labor intensity			**4**
Classroom work			
Lectures		18	
Practical lessons		36	
Seminars			
Laboratory works		12	
Independent work			
CPC		18	
SRSP		18	
Final control type			

1.4. Discipline structure

1.4.1. Thematic plan for the study of the discipline

___ semester ____ course

No.	Name sections and topics disciplines (lectures and practical exercises)	Auditory lessons				Total hours on classroom work	SRSP	Student independent	Formed competence	Used educational technologies, methods and methods of teaching	Forms of current and midterm control academic performance
		lectures	seminars	practical lessons	laboratory works						
1	Normal human intestinal microflora.	*2*		2			1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
2	The causative agents of intestinal infections.Characteristics of the family Enterobacteriaceae.Classification of Enterobacteriaceae.	2		2			1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D

3	The causative agents of food toxicological infections.General characteristics and pathogens of FTI Botulism.	2		2	1		1	1	PK-1 PK-3 PK-4	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
4	Private Microbiology.Tuberculosis.	2		2	1		1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
5	Private Microbiology. Diphtheria.	2		2	1		1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
6	Pathogens of zooanthroponotic infections.Plague. Siberian plague	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D

	Module 1										Online test (MCQ)
7	Pathogens of zooanthroponotic infections .Tularemia. Brucellosis	2		2	1		1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
8	Pathogenic cocci. Staphylococci. Streptococci.	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
9	Pathogenic cocci.Gonococci. Meningococci	2		2			1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
10	Gram-negative bacteria - agents of purulent-inflammatory diseases.Haemophilus influenzae bacillus.	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C

	Pseudomonas bacillus. Klebsiellae. Proteus.								LR12		D
11	Syphilis.	2		2	1		1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
12	HIV.	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
	Module 2										
13	Cholera	2		2			1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
14	Rickettsia	2		2			1	1	PK-1 PK-3 PK-4 LR1	LV WB/A CC S/PC AP	Pr SC CW CT CS

									LR6 LR12	E/P LW	R C D
15	Borrellia	2		2			1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
16	Protozoal infections. Malaria. Toxoplasmosis.	2		2	1		1	1	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
17	Anaerobes.Gas gangrene, tetanus.	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6 LR12	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C D
18	COVID-19	2		2	1		2	2	PK-1 PK-3 PK-4 LR1 LR6	LV WB/A CC S/PC AP E/P LW	Pr SC CW CT CS R C

									LR12		D
	Modul 3										
	Total hours by discipline:	36		54	12	102	24	24			

Abbreviation for designations of educational technologies, methods and methods of teaching:
lecture-visualization (LV),seminars using an interactive whiteboard and atlases (WB/A),analysis of clinical cases(CC),participation in scientific and practical conferences(S/PC),preparation of written analytical papers(AP),preparation and defense of abstracts, reports, essays and presentations(E/P), classes in the microbiological laboratory(LW).

Reducing the forms of current and midterm monitoring of academic performance:
OT - Online testing, Pr - assessment of the development of practical skills (abilities), SC - solving situational problems, CW - control work, CT - control task, CS - writing and protecting a curatorial sheet, R - writing and defense of the abstract, C - interview on control questions, D - preparation of a report.

1.4.2. Organization of students' independent work
3 semester course 2

No	The topic of the student's independent work:	SRS task	Recommended literature	Timing surrender (week number)
1	COVID-19	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	1
2	Typhus Fever Group	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	2
3	The microflora of the environment	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	3
4	Dysbacteriosis and other types of side effects	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology»	4

			-Robert F. Boyd «Basic Medical Microbiology»	
5	Immune drugs	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	5
6	Main laboratory tests in microbiology	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	6
7	Opportunistic infections	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	7
8	Patogenic microflora. Candidosis	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	8

9	Clinic symptoms and ways to diagnosis of syphilis	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	9
10	The main groups of chemotherapy drugs. The mechanism of antimicrobial action.	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	10
11	The effect of chemicals on microbes. Disinfection. Basic disinfectant solutions.	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	11
12.	Methods for determining the sensitivity of bacteria to antibiotics. Determination of the concentration of antibiotics in the blood and urine.	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	12
13.	Causative agents of zooanthroponotic infections	Presentation, chart, crossword,	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology».	13

		game	-Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	
14.	The mechanism of graft rejection.	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	14
15.	Biochemical activity of zooanthroponotic infections	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	15
16.	Epidemiology of Relapsing Fever	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology» -Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	16
17.	Epidemiology of Lyme Borreliosis	Presentation, chart, crossword, game	-Warren Levinson «Medical Microbiology and Immunology» -Geo. F. Brooks, Janet S. Butel. «Medical Microbiology». -Ronald B. Luftig. «Microbiology and immunology»	17

			-Nester. Roberts. «Microbiology» -Robert F. Boyd «Basic Medical Microbiology»	

1.4.3. Evaluative Assessment Tools

COURSE POLICY AND EVALUATION CRITERIA:

Type of control (current, milestone, final)	Control form	Assessment of learning outcomes
Attendance	For one missed lesson minus 2 points	20 points
Current control	Oral surveey, written work	20 points
IWS+IWW	Perfoming assignments, work with literature	20 points
Milestone control (modul submission)	Testing, control tasks	40 points
Final control (differential test)	Conversation, examination (test.edu.kg)	100 points

Scale of correspondence between grades and scores on the final control (exam)	
Score	**Grade**
90-100	«excellent»
76-89	«good»
60-75	«satisfactory»
0-59	«unsatisfactory»