

ONTÜSTIK QAZAQSTAN MEDISINA AKADEMIASY «Оңтүстік Қазақстан медицина академиясы» АҚ		SOUTH KAZAKHSTAN MEDICAL ACADEMY АО «Южно-Казakhstanская медицинская академия»
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GUIDELINES FOR INDEPENDENT WORK OF STUDENTS

Discipline: Structural organization of human physiological processes

Discipline code: SOFPCh 1203

Name of OP: 6B10115 “Medicine”

Volume of training hours/credits: 30 hours (1 credits)

Course – I, semester of study – I

Lecture length: 2 hours

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Methodological recommendations for the student's independent work were developed in accordance with the work program of the discipline (syllabus) "Microbiology" and discussed at a department meeting.

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Head Department Doctor of Medical Sciences, Professor Seyt Khanova B.T.



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№1

1. Topic: The concept of biotechnology. Microorganisms participating in biotechnological processes. Biological preparations obtained by genetic engineering. Genetics of bacteria and viruses. Genetic recombinations.

2. Goal:

- 1) Master the basics of biotechnology.
- 2) Study microorganisms, cells and processes used in biotechnology.

3. Tasks :

- 1) The essence of biotechnology.
- 2) Goals and objectives of biotechnology.
- 3) Brief history of the development of biotechnology.
- 4) Processes used in biotechnology.
- 5) Genetic engineering.
- 6) Biological preparations obtained by genetic methods engineering.
- 7) Genetics of bacteria and viruses.
- 8) Genetic recombinations: transformation, transduction and conjugation.

4. Execution form: Abstracts, presentation, essay on the topic.

5. Performance criteria: Appendix № 1

6. Due date: 1 week

7. Literature: Appendix № 2

8. Control:

1. Goals of biotechnology.
2. Objectives of biotechnology.
3. Biotechnology products obtained in medicine.
4. Use of yeast in biotechnology.
5. Use of bacteria in biotechnology.
6. Use of animal and plant cell culture in biotechnology.

№ 2

1. Topic: Characteristics of the infectious process.

2. Goal: Master the methods of biological research, widely used in the diagnosis of infectious diseases and scientific experiments.

3. Tasks:

- 1) Forms of manifest infection.
- 2) Forms of asymptomatic infection.
- 3) Pathogenicity of microorganisms as a polydeterminate trait.

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- 4) Virulence, units of its measurement.
- 5) Pathogenicity properties.
- 6) List the pathogenicity factors of bacteria and describe them.
- 7) Chemical nature, basic properties of exotoxins.
- 8) Basic properties and chemical nature of endotoxins.
- 9) Forms of infection and their characteristics.
- 10) Periods of infectious disease.
- 11) Main sources of infection.
- 12) Routes and methods of infection.
- 13) List and characterize the infectious properties of viruses, features of viral infections.
- 4. Execution form:** Abstract, presentation, essay on the topic.
- 5. Performance criteria:** Appendix № 1
- 6. Deadline:** 5 week
- 7. Literature:** Appendix № 2
- 8. Control:**
 1. Main sources of infection.
 2. Ways and methods of infection.
 3. List and describe the infectious properties of viruses, especially viral infections.
 4. Methods, methods and purposes of experimental infection of laboratory animals.

№ 3

- 1. Topic:** Mid-term № 1
- 2. Purpose:** Checking and assessing the level of residual knowledge of students.
- 3. Main questions of the topic:**
 1. Basic instruments and equipment used in microbiological laboratories.
 2. Morphological features of bacteria.
 3. Basic principles of classification of microorganisms.
 4. Technique for preparing a smear. Painting technique (simple painting method).
 5. Steps and mechanisms of Gram staining.
 6. Classification of bacteria by type of nutrition and energy sources.
 7. Classification of bacteria by type of respiration.
 8. Growth and reproduction of bacteria.
 9. Phases of reproduction of a bacterial population in a liquid nutrient medium.
 10. The main groups of bacterial enzymes and their classification.
 11. Morphology and structure of fungi. Biological characteristics of mushrooms.
 12. Morphology and structure of protozoa. Biological features of protozoa.
 13. Define the term "antibiotic". Classification of antibiotics by origin, by the mechanism of antimicrobial action.
 14. Classification of antibiotics according to their spectrum of action on microorganisms.

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15. Drug resistance of bacteria and ways to overcome it.
16. Methods for determining the sensitivity of bacteria to antibiotics.
17. Define the terms “infection”, “infectious process”, “infectious disease”. Periods of infectious disease.
18. Forms of infection and their characteristics.
19. Main sources of infection. Routes and methods of infection.
20. Features of the genetics of bacteria are one of the main conditions for their preservation as a species in nature.
21. Genetic recombinations.
22. Genetic engineering in medical microbiology.
23. Types of virus-cell interaction.
24. Stages of virus-cell interaction.
25. Virus cultivation methods. Cultivation of viruses in chicken embryos.
26. Methods for identifying (typing) viruses.
27. Biological features of bacteriophages (phages), their forms.
28. Microflora of soil, water and air.
29. The concept of normal microflora of the human body.
30. Dysbacteriosis (dysbiosis) and the causes of its occurrence.
- 4 . Type of performance/assessment:** Colloquium: oral survey (ticket tasks)
- 5. Performance criteria:** Appendix № 1
- 6. Due date:** 3 week
- 7. Literature:** Appendix № 2

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ASSESSMENT CRITERIA INDEPENDENT WORK OF STUDENTS UNDER THE GUIDANCE OF THE TEACHER

Preparation and defense of the abstract

Form control	Grade	Criteria for evaluation
Preparation and defense of the abstract	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The abstract was completed carefully and submitted on time, written independently on at least 15 pages of typewritten text, using at least 7 literary sources. Diagrams, tables and figures corresponding to the topic of the abstract are provided. When defending an abstract, the text is not read, but narrated. Confidently and accurately answers all questions asked.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The abstract was completed carefully and submitted on time, written independently on at least 10 pages of typewritten text, using at least 6 literary sources. Diagrams, tables and figures corresponding to the topic of the abstract are provided. When defending an abstract, the text is not read, but narrated. When answering questions, he makes unprincipled mistakes.
	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1 .33 ;5 5 -5 9 %) D(1.0; 50-54 %)	The abstract was completed carefully and submitted on time, written independently on at least 7 pages of typewritten text, using at least 4 literary sources. When defending an abstract, the text is read. Answers questions uncertainly and makes fundamental mistakes.
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The abstract was not completed neatly and was not submitted on time, it was written independently on less than 5 pages of typewritten text, using less than 3 literary sources. When defending an abstract, the text is read. When answering questions, he makes gross mistakes and does not understand the material.

Presentation of the topic

Form control	Grade	Criteria for evaluation
Presentation of the topic	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The presentation was completed independently, on time, with a volume of at least 25 slides. At least 7 literary sources were used. The slides are informative and concise. When defending, the author demonstrates deep knowledge of the topic. Does not make mistakes when answering questions during discussion.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The presentation was completed independently, on time, with a volume of at least 23 slides. At least 6 literary sources were used. The slides are informative and concise. When defending, the author demonstrates good knowledge of the topic. Makes

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		unprincipled mistakes when answering questions, which he corrects himself.
	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33 ;5 5 -5 9 %) D(1.0; 50-54 %)	The presentation was completed independently, on time, with a volume of at least 20 slides. At least 5 literary sources were used. The slides are not meaningful. During the defense, the author makes fundamental mistakes when answering questions.
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The presentation was not submitted on time, the volume is less than 20 slides. Less than 5 literary sources were used. The slides are not meaningful. During the defense, the author makes gross mistakes when answering questions. Does not understand his own material.

Preparation of written creative work (essay)

Form control	Grade	Criteria for evaluation
Preparation of written creative work (essay)	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The content of the work is fully consistent with the topic; The topic is revealed in a deep and well-reasoned manner . With triple composition, logical and consistent presentation of thoughts . The problem of the essay is clearly formulated. There are no actual errors. The conclusion contains conclusions that logically follow from the content of the main part.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The topic is revealed quite fully and convincingly with minor deviations from it. A thesis statement corresponding to the topic of the essay is clearly formulated. In the main part, the thesis put forward is logically, coherently , but not fully proven; there are isolated factual inaccuracies.
	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33 ;5 5 -5 9 %) D(1.0; 50-54 %)	A correct, but one-sided or insufficiently complete answer to the topic was given . There are no deviations from it or individual errors in the presentation of factual material. The material is presented quite logically, but there are some violations of the sequence of expression of thoughts. The conclusions do not fully correspond to the content of the main part
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	the topic is not completely covered, which indicates superficial knowledge. Characterized by a random arrangement of material, lack of connection between parts. Characterized by the presence of gross speech errors.

Drawing up situational problems

Form control	Grade	Criteria for evaluation
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Drawing up situational problems	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The student showed original thinking, demonstrated a deep knowledge of the material, and interdisciplinary connections were used when drawing up a situational problem. Used scientific terminology. Identified the main symptoms of the disease, microbiological laboratory data are correct.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The student, when composing the problem, made unprincipled inaccuracies, which were corrected by the student himself during the analysis of the problem. Used scientific terminology. Identified the main symptoms of the disease, microbiological laboratory data are correct.
	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33 ;5 5 -5 9 %) D(1.0; 50-54 %)	the student made inaccuracies and unprincipled errors and used scientific terminology. I experienced great difficulties in systematizing the material. I was able to identify the main symptoms of the disease; microbiological laboratory data are indicated with minor inaccuracies.
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The student created a situational problem and made fundamental errors and inaccuracies. When composing the task, I was unable to identify the main symptoms of the disease, and also indicated incorrect microbiological laboratory data.

Analysis of scientific articles

Form control	Grade	Criteria for evaluation
Analysis of scientific articles	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The work was completed carefully and submitted on time, written independently on at least 5 pages of printed text. Thoughts on the problem are presented in the form of brief theses, giving arguments. In the text of the work, references to the authors are indicated everywhere. When defending, he does not read the text, but tells it. Confidently and accurately answers all questions asked. For work, I used articles no more than 5 years old and with a high Impact factor.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The work was completed carefully and submitted on time, written independently on at least 4 pages of printed text. Thoughts on the problem are presented in the form of brief theses, but without providing arguments. In the text of the work, references to the authors are indicated everywhere. When defending, he does not read the text, but tells it. When answering questions, he makes unprincipled mistakes. For work, I used articles no more than 5 years old and with a high Impact factor.

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	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33 ;5 5 -5 9 %) D(1.0; 50-54 %)	The work was completed carefully and submitted on time, written independently on at least 3 pages of printed text. Thoughts on the issue are presented scatteredly, without providing arguments. In the text of the work, references to authors are not indicated everywhere. When defending, the text is read. Answers questions uncertainly and makes fundamental mistakes. For work, I used articles more than 5 years old and with an average Impact factor.
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The work is written on less than 3 printed pages. Thoughts are presented scatteredly. There are no references to the authors in the text of the work. There are no arguments. When defending, the text is read. When answering questions, he makes gross mistakes and does not understand the material. For work, I used articles that were more than 5 years old and with a low Impact Factor.

CRITERION FOR ASSESSMENT OF FOREIGN CONTROL

Midterm control is carried out in the form of an oral response to the ticket questions.

Each ticket consists of 3 theoretical questions . Total maximum given **90-100** points.

Form control	Grade	Criteria for evaluation
Assessment of boundary control (oral answer to ticket questions)	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	1) the contents of the ticket material are fully disclosed; 2) the material is presented competently, in a certain logical sequence, terminology is used accurately; 3) demonstrated the ability to illustrate theoretical principles with specific examples and apply them in a new situation; 4) answer independently, without leading questions; 5) There were one or two inaccuracies in the coverage of secondary issues, which were corrected after comments or leading questions.
	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The answer basically satisfies the requirements for an “excellent” rating, but it has one of the shortcomings: 1) there are small gaps in the presentation that do not distort the essence of the content of the answer; 2) one or two shortcomings were made in covering the main content of the answer, corrected after the examiner's comments; 3) an error or more than two shortcomings were made when covering secondary issues, which are corrected after the examiner's comments.

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	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33 ;5 5 -5 9 %) D(1.0; 50-54 %)	1) the content of the material is incompletely or inconsistently disclosed, but a general understanding of the issue and skills sufficient for further assimilation of the material are demonstrated; 2) there were difficulties or mistakes were made in defining concepts and using terminology, corrected after several leading questions; 3) with incomplete knowledge of theoretical material, insufficient development of competencies, abilities and skills has been identified; the student cannot apply the theory in a new situation
	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	1) the main content of the educational material is not disclosed; 2) ignorance or misunderstanding of most or the most important part of the educational material is detected; 3) Errors were made in defining concepts and using terminology, which were not corrected after several leading questions. 4) The answer to the question is completely missing. 5) refusal to answer.

CRITERIA FOR EVALUATING THE QUALITY OF A RESPONSE ABOUT A TICKET ACCOUNT AT BOARD CONTROL

The ticket consists of 3 questions. The first and second questions consist of a maximum of 30 points, the third question consists of a maximum of 40 points. Total maximum given **100** points.

Criteria for assessing student responses	Number of points for each question		
	1 question	Question 2	Question 3
The student did not answer the question	0	0	0
The student did not show even superficial knowledge of the essence of the question posed, giving an answer in relation to any term and general concept thanks to the examiner's leading question	7	7	10
The student, answering the question on the ticket, is poorly oriented in the required literature and makes gross mistakes in covering fundamental, key issues.	15	15	20
When answering additional questions, the student makes mistakes in the interpretation of individual, non-key points.	20	20	25
The student competently answers the question posed within the framework of the required literature; minor isolated inaccuracies are possible.	25	25	30

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The student answers the question asked correctly, completely, and uses additional literature.	30	30	40
TOTAL max for each question:	30	30	40
TOTAL max per ticket:	100		

Appendix No. 2

Recommended literature

Basic literature

1. Murray P. R., Rosenthal K. S., Pfaller M. A. Medical Microbiology. - Mosby, 2015
2. W. Levinson McGraw-Hill. Review of Medical Microbiology and Immunology, 2014

Additional literature

1. Saparbekova A.A. Microbiology and virology : educ. manual. - Second Edition. - Almaty : ЭСПИ, 2023. - 188 с
2. Gladwin Mark T. Clinical microbiology made ridiculously simple / Mark T. Gladwin, William Trattler, Scott C. Mahan. - 7th ed. - Miami : MedMaster, Inc, 2016. - 413 p.
3. Usmle Step 1. Immunology and microbiology : Lecturer notes / Alley Tiffany L. [et. al.]. - New York, 2019. - 511 p. - (Kaplan Medical)

Electronic textbooks

1. B. T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. CAUSATIVE AGENTS OF ACUTE RESPIRATORY VIRAL INFECTIOUS DISEASES (influenza virus, adenovirus, coronavirus) (I part) <http://lib.ukma.kz/wp-content/uploads/2022/10/Illustrated-teach.-material-eng-2.pdf>
2. B.T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. Pathogens of children's viral infections (measles, rubella, chickenpox and mumps virus) (Part II) <http://lib.ukma.kz/wp-content/uploads/2022/10/illustrated-textbook.pdf>
3. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar Lecture complex on the subject "Microbiology and immunology " (General Microbiology) <http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-General-Microbiology-2022.pdf>
4. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar LECTURE COMPLEX ON THE SUBJECT "MICROBIOLOGY AND IMMUNOLOGY"(Private Microbiology) <http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-Private-Microbiology-2022.pdf>

Electronic base

№	Name	Link
1	Electronic library SKMA	http://lib.ukma.kz/repository
2	Republican interuniversity electronic library	https://online.zakon.kz/Medicine
3	«Aknurpress» Digital library	https://www.aknurpress.kz/
4	«Epigraph» Electronic library	http://www.elib.kz/
5	Epigraph - portal of multimedia textbooks	https://mbook.kz/ru/index/
6	ABS IPR SMART	https://www.iprbookshop.ru/auth
7	"Law" base of normative legal acts	https://zan.kz/ru
8	Cochrane Library	https://www.cochranelibrary.com/