

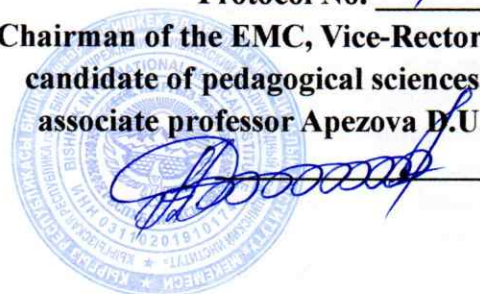


APPROVED
EMD decision

"13" 09 2021

Protocol No. 4

Chairman of the EMC, Vice-Rector,
candidate of pedagogical sciences,
associate professor Apezova D.U.



SYLLABUS by discipline

B.2.1.3. BIOLOGY WITH ELEMENTS OF ECOLOGY

For students of the educational program, of higher professional education in the specialty 560001 "General Medicine" (5-year education) in the specialty "Doctor"

Type of study work	Total hours
Course	1
Semester	1
Number of weeks	13
Credits	2
<i>The total complexity of the discipline</i>	60
Classroom/practical studies (PS)	30/30
Student Independent Work (SIW)	30
Forms of control	
current control	Testing, oral questioning, written test
Frontier control	Testing
Midterm	Testing
Final control	exam
Semester rating by discipline:	Point-rating system

Information about the teacher of the academic discipline

Full Name	Nurgazieva Asel Rysbekovna
Post	Teacher
Academic degree	Doctor of Biological Sciences
Academic title	docent
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Location of the department (address)	KR, Bishkek, st. Shabdan Baatyr 128, floor 2
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Consultation hours	11.00-13.30

Characteristics of the academic discipline

The purpose of studying the discipline is to form students' modern knowledge about the main molecular-genetic and cellular mechanisms of the functioning of the body, the basics of genetics and radiobiology, the biological foundations of the life of organisms and their application for the subsequent assimilation of biomedical, clinical disciplines and in practical medicine. By the end of the discipline, students form a systematic understanding of the levels of organization of life and the fundamental properties of a living organism, an understanding of the role of molecular-genetic and cellular mechanisms of the functioning of

a whole organism, both in normal and pathological conditions, the ability to determine the main signs of hereditary pathology for the diagnosis and prevention of common human hereditary diseases. To give an idea of the medical and biological aspects of ecology, biosphere and noosphere. Medical biology is one of the fundamental disciplines of basic medical education. Achievements and discoveries in biology are of great importance for the development and progress of biomedical and clinical disciplines.

The theoretical achievements of biology are widely used in medicine. It is the successes and discoveries in biology that determine the modern level of medical science. Thus, genetic data allowed developing methods for early diagnosis, treatment and prevention of human hereditary diseases. Biology made it possible to establish exactly what is the etiological factor in the development of a particular disease, managed to direct physicians in search of the right ways to treat certain diseases, and also helped to figure out which of the methods of preventing a particular pathology would be the best. Modern biology also laid the foundations of genetics and molecular genetics, which allowed scientists to make significant progress in understanding the etiology and developing a variety of treatments for a wide variety of pathological conditions resulting from genetic defects. The selection of microorganisms makes it possible to obtain enzymes, vitamins, hormones necessary for the treatment of a number of diseases. The development of genetic engineering opens up broad prospects for the production of biologically active compounds and medicinal substances. So, for example, using genetic engineering methods, the gene for the hormone insulin was obtained and then integrated into the genome of Escherichia coli. This strain of Escherichia coli is able to synthesize human insulin, which is used in diabetes. Somatotropin (growth hormone) and other human hormones, interferon, immunogenic preparations and vaccines are currently produced in a similar way.

There are no prerequisites for studying this discipline.

Postrequisites of the discipline:

- Biochemistry
- Microbiology
- Pathological physiology
- Virology
- Immunology

Learning outcomes of the discipline according to the RO GPP

The study of the discipline of biology with elements of ecology will contribute to the achievement of learning outcomes (LE) of the PLO:

LO-2: to recognize the influence of physicochemical, biological and immune properties of environmental factors (including therapeutic ones) on the development and course of the disease and on the body as a whole.

Within the framework of this discipline, it is expected to achieve the following learning outcomes of the discipline, which are implemented as part of the achievement of competencies:

OK-1 - able and ready to analyze socially significant problems and processes, use the methods of natural sciences, mathematics and the humanities in various types of professional and social activities;

PC-10: able and ready to carry out preventive measures to prevent infectious, parasitic and non-communicable diseases.

Content of the discipline

№№	Name of topics
1.	Introduction, Biology as a science. Levels of organization of living matter. Criteria of living systems.
2.	The doctrine of the cell Inorganic substances that make up the cell. Organic substances that make up the cell. Biological polymers are proteins. Organic molecules - carbohydrates, fats, lipoids Biological polymers - nucleic acids.
3.	Metabolism is the basis of the existence of living organisms Plastic exchange Energy exchange. Autotrophic type of metabolism.
4.	The structure and functions of cells Prokaryotic and eukaryotic cells. Cell membrane, cytoplasm, cell organelles. Cell division. Mitosis. Non-cellular life forms are viruses.

5.	Reproduction and development of organisms Sexual and asexual reproduction. Ways of cell division. Meiosis
6.	Ontogenesis. Embryonic period of development. Embryonic induction. Postembryonic period of development. Individual human development. Causes of violations in the development of organisms. reproductive health. The consequences of the influence of alcohol, nicotine, narcotic substances, environmental pollution on human development.
7.	Fundamentals of genetics and selection. Patterns of inheritance of traits Genetics is the science of the patterns of heredity and variability. G. Mendel is the founder of genetics. Symbolism used in genetics. Laws of inheritance of traits: the law of independent combination of genes. Dihybrid cross. Sex genetics. Sex-linked inheritance.
8.	Regularities of variability. The variability of organisms: hereditary or genotypic variability. Non-hereditary variability. Human genetics. The value of genetics for medicine. Hereditary human diseases.
9.	Selection basics. Biotechnology, its achievements and prospects.
10.	Origin and development of life on Earth. evolutionary doctrine. microevolution Natural selection in natural populations. Macroevolution. Development of the organic world.
11.	Human Origins. Evidence of the relationship between humans and animals. The main stages of human evolution. Races of man. The current stage of human evolution.
12.	Fundamentals of ecology. Ecology - the science of the relationship of organisms with each other and the environment. Ecological factors, their importance in the life of organisms. Biogeography. Species and spatial structure of ecosystems. Natural communities of living organisms. Biogeocenoses. Abiotic environmental factors. Interspecific relationships in an ecosystem: symbiosis, competition, neutralism.
13.	Bionics. Bionics as one of the areas of biology and cybernetics. The use of structural features and adaptations of plants and animals in the economic activities of people.

List of main and additional literature:

Main literature::

1. Pekhov A.P., Biology. Medical biology, genetics and parasitology: a textbook for medical schools / A.P. Pekhov. - M.: Publishing house: GEOTAR-Media, 2010. - 657 p.
2. Pekhov A.P., Biology. medical biology, genetics and parasitology. textbook for medical schools / A.P. Pekhov. - M.: Publishing house: GEOTAR-Media, 2011. - 657 p.
3. Slyusarev A. A., Biology with General Genetics. textbook for students of medical universities - 2011–657 p.

Additional literature:

1. Chebyshev N.V., Biology. Textbook for students of medical schools and postgraduate education of doctors. recommended UMO - M.: Publishing house: GEOTAR-Media, 2010. - 416 p.
2. Workbook for mastering laboratory and practical skills in biology. Part I Cytology with the basics of molecular biology: method. rec. for laboratory studies: for 1st year students studying in the specialty 060108 - Pharmacy / under general. Ed. T.S. Kolmakova. - Rostov-n / D: publishing house of RostGMU, 2011. - 50p.
3. Workbook for mastering laboratory and practical skills in biology. Fundamentals of genetics. Onto- and phylogenesis. Fundamentals of parasitology. guidelines for laboratory studies for students studying in the specialty 060301 - Pharmacy / under the general. Ed. T.S. Kolmakova. - Rostov-n / D: publishing house RostGMU, 2012. - 96p.

Test tasks in biology (to prepare for the exam) for 1st year students / compiled by T.S. Kolmakova, L.I. Ramazanova, E.A. Rogacheva [i dr.]. - Rostov n / a: Publishing house of RostGMU, 2011. - 81 p.

Internet resources:

1. Scientific electronic library eLIBRARY. - Access mode: <http://elibrary.ru>
- 2 CyberLeninka scientific. electron. bib. - Access mode: <http://cyberleninka.ru/>
- 3 Khan Academy apps
- 4 Moodle

Monitoring and evaluation of learning outcomes

The content of the rating system for assessing student performance

The rating assessment of students' knowledge in each academic discipline, regardless of its total labor intensity, is determined on a 100 (one hundred) - point scale and includes current, boundary, intermediate and final control.

The distribution of rating scores between types of control is established in the following ratio (according to the table of the score-rating system of assessments):

Form of control				
current (CC)*	boundary control (BC)**	mid-term exams (MC)***	Final /exam (FE)	Discipline Rating (RD)
0-100 points	0-100 points	0-100 points	0-100 points	0-100 points, with the translation of points into a letter designation

Note:

* $TK(middle) = \frac{\sum_1^n \times point}{\sum_1^n}$, where n is the number of types of classroom and extracurricular work of students in the discipline;

** $PK(middle) = \frac{\sum_1^n credit \times point}{\sum_1^n credits}$, where n is the number of modules (credits) in the discipline;

*** $ПК(middle) = \frac{\sum_1^n \times point}{\sum_1^n}$, where n is the number of intermediate controls (2 controls per semester: in the middle and at the end of the semester) by discipline;

**** ИК – examination conducted at the end of the study of the discipline

;

***** $РД = \frac{TK_{ср} + PK_{ср} + ПК_{ср} + ИК}{4}$, the final rating of the results of all types of control at the end of the discipline;

GPA = $\frac{\sum_1^n \times балл}{\sum_1^n}$ where, n is the number of disciplines in the semester (for the past period of study).

A student who has not passed the current, boundary and intermediate controls to the final control (exam) is not allowed.

The current control is carried out during the period of classroom and independent work of the student on time according to the schedule, at the end of the study of the discipline, the average score of the current control (CC) is calculated. *Forms of current control can be:*

- testing (written or computerized);
- performance of individual homework assignments, abstracts and essays;
- student's work in practical (seminar) classes;
- various types of colloquia (oral, written, combined, express, etc.);
- control of performance and verification of reporting on laboratory work;
- visiting lectures and practical (seminar, laboratory) classes;
- Incentive rating (up to 10 points).

Other forms of current monitoring of results are also possible, which are determined by the teachers of the department and recorded in the work program of the discipline.

The frontier control is carried out in order to determine the results of the student's development of one credit (module) as a whole. *Frontier control* should be carried out only in writing, at the end of the study of the discipline, the average score of boundary control (BC) is calculated. As forms of *frontier control* of the training module, you can use:

- testing (including computer testing);
- interview with written fixation of students' answers;
- test.

Other forms of intermediate control of results are also possible.

Intermediate control (mid-term exams) is carried out in order to check the completeness of knowledge and skills in the material in the middle and end of the semester (2 times per semester) of studying the discipline, by the end of the study of the discipline, the average score of intermediate control (PCsr) is calculated, *forms of intermediate control (mid-term exams) can be:*

- testing (including computer testing);
- interview with written fixation of students' answers;
- test.

Other forms of intermediate control of results are also possible.

The final control is carried out during the session, by conducting an exam, it can be carried out in the following forms:

- testing (including computer testing);
- written exam (ticketing system).

Correspondence of the point-rating system of assessments used by the institute and the assessments of the European system for the transfer of credit units, labor intensity (ECTS)

Grade						Criterion
System of letters	digital system	Traditional system	Points (%)	Scored points (max - 100)	Evaluation by discipline without an exam	
A	4	5	95-100	95-100	Credited/ passed	"Excellent" - deserves a student who has shown a deep, systematic and comprehensive knowledge of the educational material, who freely performs practical tasks, who has mastered the recommended basic and additional literature on the discipline
A-	3,67		90-94	90-94		"Excellent" - deserves a student who has shown a deep, systematic and comprehensive knowledge of the educational material, who freely performs practical tasks, who has mastered the recommended basic literature on the discipline, but is not familiar with additional literature
B+	3,33	4	85-89	70-89		"Good" - exhibited to a student who has shown a systematic and comprehensive knowledge of the educational material, able to independently replenish and update this knowledge in the course of training, performing practical tasks, familiar with the main literature on the discipline
B	3,0		80-84			"Good" is given to a student who has shown a systematic and comprehensive knowledge of the educational material, who is able to independently replenish this knowledge in the course of training, performing practical tasks, but not fully familiar with the main literature on the discipline
B-	2,67		75-79			"Good" - is given to a student who has shown the systematic nature of knowledge in the discipline, who is able to independently replenish this knowledge in the course of training, performing practical tasks, but not fully familiar with the main literature on the discipline
C+	2,33		70-74			"Satisfactory" - is given to a student who does not have a systematic nature of knowledge in the discipline, who is not capable of independently replenishing and updating knowledge in the course of further education, performing practical tasks with errors
C	2,0	3	65-69	50-69		"Satisfactory" - is given to a student who made mistakes in completing assignments, but who has the necessary knowledge to eliminate them under the guidance of a teacher
C-	1,67		60-64			"Satisfactory" - is set to a student who made errors in the performance of tasks, but who has the possible knowledge to eliminate them under the guidance of a teacher
D+	1,33		55-59			"Satisfactory" - is set to a student who made errors in the performance of tasks, who does not have the necessary knowledge to eliminate them
D-	1,0		50-54			Satisfactory" - is given to a student who has made significant errors in the performance of tasks, who does not have the necessary knowledge to eliminate them
FX	0,5	2	25-49	Less of 50	not credited/not passed	"Unsatisfactory" - is set to a student who has not completed the task, does not have the necessary knowledge to eliminate them
F	0		0-24			"Unsatisfactory" - is set to a student who has not completed the task, does not have the necessary knowledge to eliminate them, even under the guidance of a teacher

Academic achievement requirements:

Attendance by students of all classroom classes without delay is mandatory.

In case of absence, classes are worked out in the order established by the dean's office.

If there are three passes, the teacher has the right not to allow the student to attend classes until the issue is administratively resolved.

If the absence of classes is more than 20.0% of the total number of classes, the student automatically enters the summer semester.

Note to the student:

- ✓ regularly review lecture material;
- ✓ Do not be late and do not miss classes;

- ✓ work off missed classes if you have permission from the dean's office;
- ✓ Actively participate in the classroom (individually and in groups;)
- ✓ timely and fully complete homework assignments;
- ✓ submit all assignments within the time specified by the teacher;
- ✓ independently study the material in the library and at home;
- ✓ timely and accurately fulfill the tasks of the teacher, individual tasks for the IWS to achieve learning outcomes;
- ✓ to master the basic and additional literature necessary for the study of the discipline;
- ✓ performing tasks, the student should not copy or reproduce the work of other students, scientists, practitioners, plagiarism;
- ✓ develop their intellectual and oratory skills;

In case of non-compliance with the requirements of the Memo, the student will be penalized in the form of deducting points (one point for each violated item).

If the requirements of the Memo are fully met, the student is encouraged in the form of an additional 10 points to the final control in the discipline.

Academic Integrity, Conduct and Ethics Policy:

- turn off your cell phone during class;
- Be polite;
- respect other people's opinions;
- formulate objections in the correct form;
- do not shout or raise your voice in the audience;
- independently complete all semester assignments;
- Eliminate plagiarism from your practice;

Methodical instructions.

It is recommended to organize the time required to study the discipline as follows:

When preparing for a practical lesson, you must first read the abstract with the teacher's explanations.

When performing exercises, you must first understand what you want to do in the exercise, then proceed to its implementation.

Literature work. The theoretical material of the course becomes more understandable when books are studied in addition to the abstract. After studying the main topic, it is recommended to perform several exercises.

Preparation for boundary and intermediate controls. In preparation for the boundary and intermediate control, it is necessary to study the theory: the definitions of all concepts before understanding the material and independently do several exercises.

Independent work of students is organized on all studied topics of each section. Independent work is carried out in the form of:

- work in Internet sites;
- work with basic and additional literature;
- fulfillment of written assignments;
- preparation of reports, abstracts, tables and posters on