

REPUBLIC OF UZBEKISTAN  
MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION  
MINISTRY OF HEALTH  
TERMIZ BRANCH OF TASHKENT MEDICAL ACADEMY  
DEPARTMENT OF MEDICAL BIOLOGY AND HISTOLOGY



"Approved"

By deputy director for  
education work

Y. B. Gulyamov

27 " 12 2023.

MODULE PROGRAMME OF MEDICAL BIOLOGY, GENERAL  
GENETICS.

1st course  
( Syllabus )

Knowledge :- 900000 Health and Social Welfare

Field of education : - 910000 health care

Educational direction : - 60910200 Treatment work

Termiz-2023

The working curriculum of the module is approved by the Tashkent Medical Academy order No. 246 dated August 5, 2022 (Appendix 1 of the order) "Medical biology. Prepared on the basis of the "General genetics" module program.

**Developers:**

Khoshimova. S .Sh- Assistant of the Department of Medical Biology and Histology, Termez branch of TMA

**Reviewers:**

**Internal Reviewer:**

Pardayev O.T - PhD , head of the Department of "Medical Chemistry and Biochemistry" of TB TMA

**External**

**reviewer:** - Associate Professor of the Zoology Department of Termiz State University  
Tangirov H. T

The working module program "Medical Biology General Genetics" was reviewed by the TB TMA Department of "Medical Biology and Histology" and recommended to the branch council.

Module was discussed and approved by the branch council . (Declaration No. 5 of "27" 12 of 2022.)

**Head of the department :**



Nurova .Z .A

**Dean of the Faculty :**



Sagirayev .N.J

**Head of the educational and methodological department:**



Z.U. Berdiyeva

<b>Module code</b> TBUG11-207	<b>Academic year</b> 2023/2024	<b>Term</b> 1-2	<b>Credits</b> 8
<b>Module type</b> Mandatory	<b>Language of education</b> English		<b>Class hours per week</b> 5/5
<b>Module name</b>	<b>Auditorium training (hours)</b>	<b>Independent education (hour)</b>	<b>Total load (hours)</b>
Medical biology. General genetics	24/96	60/60	240

### I. Content of the module

**The purpose of teaching the module** is to form a scientific outlook in specialists; studying a person as a biosocial being with an emphasis on biological laws; arouse interest in practical health care; preparation for independent work through theoretical, methodological and practical skills; it is necessary to form a basis for mastering both theoretical and clinical modules.

To achieve this goal, the module fulfills the tasks of forming students' theoretical knowledge, practical skills, methodical approach to phenomena and processes of biological laws, and scientific outlook.

**The task of the module** is practical skills, "Medical biology. General

Methodical approach to the "genetics" module and formation of a scientific worldview, education of scientific worldview and high human qualities in students who are preparing to study theoretical, social and clinical modules, in-depth study of biological phenomena of direct interest for health care practice. Medical biology and The genetics educational credit module is a fundamental module and occupies an important place in shaping the outlook of doctors. This module is a system that studies organisms and their environment, it teaches the laws of the existence and development of life, matter as a separate form in motion, the main characteristics of life, the variability of nature, the role of evolutionary processes in it, ecological laws includes teaching the importance, biological foundations, the essence of life, biological systems and their levels of structure and development mechanisms. The module of medical biology and genetics leads to the expansion and deepening of the students' consciousness from a biological point of view. By thoroughly mastering genetic rules and laws the student will correctly understand and interpret the individual development of the organism, the causes of diseases in it.

### II. The module includes the following topics:

#### II.1. Lecture topics

No	Lecture topics	Size hours
----	----------------	------------

<b>1st semester</b>		
<b>1</b>	The role of biology in the medical education system	2
<b>2</b>	Molecular basis of life.	2
<b>3</b>	Cellular basis of life	2
<b>4</b>	Basics of general genetics. Chromosomal theory of heredity	2
<b>5</b>	Molecular basis of heredity. Genetic engineering and biotechnology.	2
<b>6</b>	Variability.	
	<b>Total</b>	<b>12</b>
<b>2nd semester</b>		
<b>1</b>	Human genetics and medical genetics	2
<b>2</b>	General laws of individual development.	2
<b>3</b>	Onto-phylogeny of human organs. Anthropogenesis.	2
<b>4</b>	Man and the biosphere. Human ecology.	2
<b>5</b>	Medical parasitology. Medical protozoology	2
<b>6</b>	Medical helminthology and arachnoentomology. Poisonous animals	2
	Total	12
		<b>24</b>

Lectures are held in auditoriums equipped with multimedia devices for the flow of academic groups.

## **II. Practical training**

<b>No</b>	<b>Topics of practical training</b>	<b>Size of hours</b>
<b>1st semester</b>		
<b>1</b>	Microscope. Rules for working with a microscope. Preparation of temporary preparations.	4
<b>2</b>	Viruses. Pro-eukaryotic cells. Their unique general structure and differences. Ultrastructural structure of eukaryotic cells. The cell membrane is its delicate structure and the entry of substances into the cell.	4
<b>3</b>	Mitotic and life cycle of cells. Cell proliferation.	4
<b>4</b>	Meiotic cell division. Pathology of mitosis and meiosis. Reproduction of organisms.	4
<b>5</b>	Monohybrid crossbreeding. Interaction of allelic genes, polyallelism.	4
<b>6</b>	Di- and polyhybrid crossbreeding. Interaction of non-allelic genes.	4

7	Chromosome theory of heredity. T. G. Morgan. The condition of combining genes, crossing over. Sex-linked inheritance of characters.	4
8	Molecular basis of life. Nucleic acids and their role in the transmission of hereditary characters.	4
9	The role of DNA in protein biosynthesis. Genetic engineering. Variability and its forms.	4
10	Methods of studying human genetics: genealogical and twin method.	4
11	Study methods of human genetics: cytogenetic, population statistics. Methods of studying human genetics: dermatoglyphics, biochemical. Prenatal diagnosis.	4
12	Hereditary diseases: chromosomal diseases. Hereditary diseases: genes and inherited diseases. Types of marriage. Medical genetic counseling.	4
	<b>Total</b>	<b>48</b>
	<b>2nd semester</b>	
1	General laws of proembryonic development (Progenesis). General laws of embryonic development. (Embryogenesis). Teratogenic factors. General laws of postembryonic development. Gerontology. Regeneration. Homeostasis. Transplantation	4
2	Fungi are human parasites: trypanasoma, leishmania, trichomonas and giardia.	4
3	Spores are human parasites. Malaria parasites, toxoplasma, coccidia. Intestinal parasites: intestinal amoeba, intestinal balantidia.	4
4	Suckers are human parasites. Liverworm, lanceolate sucker, cat, lungworm, bloodsucker.	4
5	Tapeworms are human parasites: pig, cattle solitaire, small worm, cerbar tapeworm, echinococcus, alveococcus.	4
6	Roundworms: ascarida, ostrisa, filaria, Roundworms: trichinella, hookworm, hookworm, hookworm.	4
7	Ovogelmintoscropy methods. Devastation. Deworming.	4
8	Medically important arachnids: Country tick, itch, dog and taiga ticks.	4
9	Insects of medical importance: lice, fleas, fleas, and cockroaches	4
10	Insects of medical importance: mosquitoes, flies, wasps. Poisonous animals.	4
11	Ontophylogeny of organ system: skin, skeleton, digestion, nervous systems. Ontophylogeny of the organ system: endocrine, circulatory, respiratory, and reproductive systems.	4

12	Ecology. Man is an ecological factor. Biosphere and its problems.	4
	<b>Total</b>	<b>48</b>

Practical classes are held separately for each academic group in auditoriums equipped with multimedia devices and laboratory equipment. Active and passive methods are used in the classes. "Project-based teaching", brainstorming, case-study and other technologies are used. Distributed materials and information are transmitted using multimedia devices.

### III. Practical skills

List of practical skills acquired during the module:

No	The name of the practical skill
<b>1 semester</b>	
1	Work with a light microscope;
2	Preparation of temporary preparations for viewing under a microscope;
3	Identification of parts of living cells in preparations;
4	Finding and identifying mitotic figures in preparations;
No	The name of the practical skill
<b>2 semesters</b>	
1	Compilation and analysis of family trees;
2	Analysis of karyotypes and detection of chromosomal disorders;
3	Identification of parasites from the type of simple animals in micropreparations;
4	Identification of eggs and larvae of various helminths;
5	Identification of eggs and sperm cells.

### I V. Independent education

No	Independent study topics	Size of hours
<b>1st semester</b>		
1	Microscope. Rules for working with a microscope. Preparation of temporary preparations.	5
2	Viruses. Pro-eukaryotic cells. Their specific general structure and differences. Ultrastructural structure of eukaryotic cells.	5
3	The cell membrane is its delicate structure and the entry of substances into the cell.	5
4	Mitotic and life cycle of cells. Cell proliferation . .	5

5	Meiotic cell division. Pathology of mitosis and meiosis. Reproduction of organisms.	5
6	Monohybrid crossbreeding. Interaction of genes that are alleles, polyallelism. Di- and polyhybrid crossbreeding. Non-allelic gene interactions.	5
7	Chromosome theory of heredity. TGMorgan. The condition of combining genes, crossing over. Sex-linked inheritance of characters.	5
8	Molecular basis of life. Nucleic acids and their role in the transmission of hereditary characters.	5
9	The role of DNA in protein biosynthesis. Genetic engineering. Variability and its forms.	5
10	Study methods of human genetics: genealogical and twin method. Study methods of human genetics: s itogenetics, population statistics.	5
11	Methods of studying human genetics: dermatoglyphics, biochemical. Prenatal diagnosis.	5
12	Hereditary diseases: chromosomal diseases. Hereditary diseases: genes and inherited diseases. Types of marriage. Medical genetic counseling.	5
	<b>Total</b>	<b>60</b>
	<b>2nd semester</b>	
1	General laws of proembryonic development (Progenesis). General laws of embryonic development. (Embryogenesis). Teratogenic factors.	5
2	General laws of postembryonic development. Gerantology. Regeneration. Homeostasis. Transplantation.	5
3	Fungi are human parasites: trypanasoma, leishmania, trichomonas and giardia.	5
4	Spores are human parasites. Malaria parasites, toxoplasma, coccidia. Intestinal parasites: intestinal amoeba, intestinal balantidia.	5
5	Suckers are human parasites. Liverworm, lanceolate sucker, cat, lungworm, bloodsucker.	5
6	Tapeworms are human parasites: pig, cattle solitaire, small worm, cerbar tapeworm, echinococcus, alveococcus.	5
7	Roundworms: ascarida, ostrisa, filaria, Roundworms: trichinella, hookworm, hookworm, hookworm. Ovogelmintoscopy methods. Devastation. Deworming.	5
8	Medically important arachnids: Country tick, itch, dog and taiga ticks.	5
9	Insects of medical importance: lice, fleas, fleas, and cockroaches Insects of medical importance: mosquitoes, flies, wasps. Poisonous animals.	5

10	Ontophylogeny of organ system: skin, skeleton, digestion, nervous endocrine systems, blood circulation, respiration, reproductive systems.	5
11	Ontophylogeny of the organ system: endocrine systems, circulatory, respiratory, and reproductive systems.	5
12	Ecology. Man is an ecological factor. Biosphere and its problems.	5
	<b>Total</b>	<b>60</b>

Independent study topics are mastered by students outside of the classroom and are taken into account in the current subject-specific assessment.

### **V. Learning outcomes. Professional competences:**

#### **At the end of 1 semester**

##### **Student:**

- the necessity of the medical biology and genetics module for mastering other fundamental and clinical modules;
- to have an idea about the interdependence of physical, chemical and biological processes and the fact that medical modules are functionally the same, the uniqueness of modern medical education and the main stages of development;
- the genetic mechanisms of living systems, and the laws of inheritance of normal and pathological signs;
- knowledge of the genetic basis of hereditary diseases and the heredity of signs in a person;
- modern theoretical knowledge of the currents that make up the biological heritage of people;
- molecular, cellular of living nature. It is necessary to know the knowledge of medical theory based on general biological laws defined in the structures at the system level.

#### **At the end of 2 semesters**

##### **Student:**

- to have an idea about the biological diversity of the world, the importance of homeostasis, the interaction of the organism and the environment, the ecological activity of organisms in ecosystems, the ecological principles of nature protection;
- the solution of important biological facts in explaining the genetic mass in the population and the principles of human health care;
- in-depth knowledge in the study of the biology of rare organisms of direct interest in practical health care;
- to study the laws of formation of systems and organs of the human organism in ontogenesis, as well as the relationship between onto and phylogeny; should know how to form knowledge and ideas about the phylogenetic nature of birth defects, which are important in the practical work of doctors.

## VI. Educational technologies and methods

- Interactive games;
- Seminar, logical thinking, interactive questions and answers;
- Working in groups;
- Entering presentations;
- Individual projects;
- Projects for teamwork and advocacy.

## VII. Requirements for obtaining credits:

Completion of tasks and tasks given in the form of current control, oral inquiry and test on the types of intermediate and final control.

**Students' knowledge is evaluated in a 100-point system based on the criteria listed in the table below**

Ball	Degree	Equivalent score	Grade	Criterion
90-100	A	5	Excellent	The student makes independent conclusions and decisions, can think creatively, observes independently, can apply the acquired knowledge in practice, understands the essence of science (topic), knows, can express, tell, has an idea about science (topic)
85-89	B+	4	Very good	The student makes independent conclusions and decisions, observes independently, can apply the acquired knowledge in practice, understands the essence of science (topic), knows, can express, tell, has an idea about science (topic)
71-84	B	4	Good	The student observes independently, can apply the acquired knowledge in practice, understands the essence of science (topic), knows, can express, tell and has an idea about science (topic)

60-70	C	3	Satisfactory	The student can apply the acquired knowledge in practice, understands the essence of science (topic), knows, can express, tell and has an idea about science (topic)
0-59	F	2	You are not satisfied	The student has not mastered the science program, does not understand the essence of the science (topic), does not have an idea about the science (topic)

### Basic literature

1. Khalikov PX, Kurbanov AQ, Daminov AO, Tarinova MV Medical biology and genetics. Textbook. Tashkent. 2019
2. Khalikov P.Kh. Kurbanov A.K. Daminov A.O. Tarinova M.V. Medical biology and genetics. Textbook. Tashkent 2022.
3. Nishonboyev KN, Hamidov JH Medical biology and genetics. Textbook. Tashkent. 2005
4. Yarygin MN, Biology. Textbook. Moscow 2016

### Additional literature

5. Pekhov AP Biology. Medical biology, genetics, parasitology. Textbook. Moscow. 2014
6. Tashkhodjaeva PI Biology. Tashkent. 1996
7. Khamidov JX et al. Handbook of Medical Biology and Heredity. 1991
- Alimkhodzhaeva PR, Zhuravleva RA Management of medical parasitology. Textbook. Tashkent. 2004
8. Daminov AO from Genetics set of issues. Tashkent . 2013 \_ \_
9. Alimkhodzhaeva PR, Zhuravlyova RA Management of medical parasitology. Tashkent. 2004
10. Olimkhujaeva PR, Inogomova DR Medical genetics. Tashkent . 2002 \_
11. Nishonboev KN, Khamraeva FA, Eshonkulov OE Medical genetics. Textbook. Tashkent. 2000
12. Nishonboev KN, Olimkhujaeva PRO. Tashkent. 1996
13. Khalikov PX Sitogeneticheskiy metod v izuchenii nasledstvennosti cheloveka. Tashkent. 2004

**Internet sources:**

14. <http://www.medline.ru> .
15. <http://www.freebooks4doctors.com/fl/spec4.htm> ;
16. <http://www.ncbi.nlm.nih.gov/entrez/>
17. <http://www.histology.narod.ru/>
18. <http://rsmu.ru/8894.html>
19. <http://www.dapamojnik.info/gist/>
20. [www.morphology.dp.ua/hist.php](http://www.morphology.dp.ua/hist.php)
21. <http://histologyatlas.wisc.edu/>
22. <http://www.histology-world.com/>
23. <http://www.visualhistology.com/>

**SYLLABUS FROM MODULE I**

The full name of the module	<b>Medical biology. General genetics</b>			
Code of the module : TBUG11-207	Credit amount: 7 From him : 1 semester – 4 credits 2 semesters-3 credits JN – 7 credits: test – 0 credits (compulsory)	Module transition period : 1-2 term		
Course of Study	6091 0 200 – Treatment	Bachelors of the 1st stage		
Duration of the module	12 weeks			
Study hours h size:	Total Hours:	120		
	This includes :	Total	1 <sup>st</sup> term	2 <sup>nd</sup> term
	Lecture	24	12	12
	practical training	96	48	48
	laboratory training		-	-
	independent education	120	60	60
Learning module status	Block of pre-clinic modules			
Name of Medical institute, address	TTA Termiz branch, IAKarimov street			
Information about the teachers of this course	Speaker: associate professor: Nurova ZA Practical training assistant teachers: Sharipova FS Kongirotova AI Narzullayeva GQ	Nurova73@gmail. com  <a href="mailto:saripovafarida781@gmail.com">saripovafarida781@gmail.c om</a>		

		anorkholinoyatovna@gmail.com narzullayevagulchexra57@gmail.com
Time and place of training	TTA Termiz branch 1 educational building 1 floor lecture hall No. 1 Audiences : No. 117 , No. 1 15, No. 121 , No. 123	
Content of the module	The module program is an important normative-methodical document of the educational process, in which educational materials include lectures, seminars, colloquiums, practical and laboratory exercises, training, situational issues, if necessary in teaching the module. independent work, drawing, laboratory and other works are expected to be used provided that they comply with the standards of time allocated to them.	
Prerequisites _	The theoretical part of biology, human anatomy, medical chemistry modules is counted.	
Postrequisites	Biochemistry, Pharmacology, Human Anatomy, Pathological Anatomy and Pathological Physiology modules and all pre-clinical and clinical modules serves as a theoretical ground for	
Purpose of the module	Study of biological processes observed in a healthy human body.	
Tasks of the module	foundation for clinical knowledge acquisition .	
Requirements for student knowledge, skills and competences for the module	<p><b><i>The student must have an imagination:</i></b></p> <ul style="list-style-type: none"> <li>- About the role of biology in medicine, the biosocial nature of man;</li> <li>- about various mutagenic and carcinogenic and other negative effects on the human body as a biological object;</li> <li>- Classification of parasites, about their biology;</li> <li>- about various anomalies that can be observed in the main stages of development of the human body;</li> <li>- About clinical symptoms and first aid when bitten by poisonous animals in Uzbekistan;</li> </ul> <p><b><i>The student should know:</i></b></p> <ul style="list-style-type: none"> <li>- Human body cell types, general structure and functions;</li> <li>-mutagenic factors, the effect of carcinogenic factors on heredity;</li> <li>-human genetics, human heredity, various genetic diseases observed in humans, biology of origin;</li> <li>- Widespread parasitic diseases in the environment of Uzbekistan, their biology;</li> <li>- Studying the general laws of evolutionary changes of organs and systems in medicine: causes of developmental anomalies, rudiments, atavisms;</li> </ul>	

	<p><b><i>The student should have the skills to:</i></b></p> <ul style="list-style-type: none"> <li>- working with a microscope;</li> <li>- viewing and reading micropreparations under a light microscope;</li> <li>- determination of sex chromatin, human karyotype;</li> <li>- to be able to distinguish types of mutations and their preparations;</li> <li>- correctly describe the main structures in preparations in the album;</li> <li>- being able to distinguish between parasites and eggs;</li> </ul>
Teaching methods	Lectures and practical training .
Supply	Video lectures, presentations of practical lessons, textbooks, handouts, tests, case studies, study guides.