National Pirogov Memorial Medical University, Vinnytsya

"APROVE "
Vice - Rector for Academic Affairs

Prof. Y.I. Guminskiy
"___" серпня 20___ year

" AGREED "
Head of medical biology department
Sen.res. V.M. Shkarupa
" 27 " серпня 2020 year

SYLLABUS
of academic discipline
«MEDICAL BIOLOGY»

Specialty	222 Medicine
Educational level	the second (master`s) level
Educational programme	EPP Medicine, 2020
Academic year	2020-2021
Department	Medical biology
Lecturer (if lectures are given)	Polesya T.L.
Contact information	*medbiology@vnmu.edu.ua,* *str.Stusa 2 ,*
Syllabus compiler	as. Vasenko T.B., as. Klimchuk I.M.

1. Status and structure of the discipline

Discipline status	Compulsory
Discipline code in EPP/discipline place in EPP	CC 10, discspline of general training
Course / semester	*1nd year (I-II semesters)*
The amount of discipline (the total number of hours / number of credits ECTS)	165 hours / 5,5 credits ECTS
The structure of the discipline	Lectures - 20 hours Practical classes - 60 hours Independent work -85 hours In general : Lecture classes – 48,5%, Independent classwork - 51.5%
Number of content modules	2
Language of study	English
Form of study	Full-time (*or remote full-time by order)*

2. Description of the discipline

Short annotation of the course, relevance.

The subject direction of discipline is general medical biology. The course is focused on obtaining fundamental knowledge of general biology, characteristics of human genetics, features of studying parasites and pathogens of parasitic with human body, obtaining knowledge of the formation of general principles of prevention and treatment of infections diseases.

Prerequisites. For successful mastering of discipline, the student needs the knowledge received in the course of studying of the following general disciplines:
« General biology», «Human biology», «Biology of animals», «Phytobiology».

The purpose of the course and its significance for professional activities. The purpose of discipline is the formation of knowledge and practical skills in human biology for further assimilation by students of the Disciplines, providing natural, scientific and professional-practical training.

Postrequisites. Discipline "Medical Biology" is the foundation for further mastering by students knowledge of profile theoretical and clinical professional practical disciplines**.**

Histology, cytology, embryology. Structural-functional cell organization. Gametogenesis. Embryogenesis. Morphogenesis.

Anatomy of a person. Evolution of bodies. Onontophylogenetic predetermination of defects in the development of human bodies

Biological chemistry. Bases of molecular genetics. Hereditary metabolic diseases.

Obstetrics and gynecology. Fertilization. Ontogenesis. Teratogenesis. Prenatal methods for diagnostics hereditary pathology (chorionbiopsy, amniocentesis and fetoscopy).

Pediatrics. Morphology, Life Cycles, Diagnosis and Prevention of Protozoonosis and Child helminthiasis. Mechanisms by caused of hereditary diseases.

Dermatovenerology. Morphology, life cycle of sarcoptes scabiei and pubic lice. Pathogenesis, clinical features and prophylaxis of pediculosis, scabies and phthyriasis. Morphology, Leishman's life cycle. Pathogenesis, clinical features, diagnostics and prevention of visceral leishmaniasis. Morphology, life cycle of trichomonas vaginalis. Pathogenesis, clinical features, diagnostics and prevention of urogenital trichomoniasis.

Infectious diseases. Morphology, life cycles, pathogenesis, clinical fetures, diagnostics and prevention of protozoons and helminthosis.

3. **Learning outcomes. After successful study of the discipline the applicant will be able to:**

1. Conduct to analyze the information received.
2. Make substantiated solutions.
3. Be able to acquire modern knowledge.
4. Establish appropriate ties to achieve goals.
5. Be responsible for timely acquisition of modern knowledge.
6. Have specialized conceptual knowledge gained in the learning process.
7. Be able to solve complex tasks and problems that arise in professional activity.
8. The ability to effectively form a communication strategy in professional activity; Understanding and unambiguous addition of their own conclusions, knowledge and explanations that are substantiated to specialists and non-specialists.
9. Be responsible for making decisions in difficult
10. Have a thorough knowledge of a professional activity structure. Be able to carry out professional activity requiring renewal and knowledge integration.
11. Be responsible for professional development, the ability to further professional training with a high level of autonomy.
12. To know the problems of environmental preservation and ways to save it. Be able to form the requirements for yourself and surrounding the environmental preservation.
13. Make proposals to the relevant bodies and institutions for measures to preserve and protect the environment.
14. Be responsible for implementing environmental protection measures within their competence.
15. To allocate a leading clinical symptom or syndrome by making a reasonable decision.
16. Establish the most likely or syndromic diagnosis of the disease.
17. Assigning a laboratory and / or instrumental examination of the patient by taking a well-grounded solution, with the help of matching with standards.
18. To implement differential diagnosis of diseases: by taking a well-grounded solution, according to a certain algorithm, using the most likely or syndrome diagnosis, lab and instrumental examination of the patient.
19. Establish a preliminary clinical diagnosis by making a reasonable solution and logical analyses.

4. **Content and logistic of the discipline**

Module **1 Biological features vital activity of human life. Organisms level organization of alive. Bases of human genetics.**	1semester 77 hours/2,6 credits	Lectures №№ 1-5 Practical classes №№ 1-30 Topics for self- study №№ 1-37_____
Module 2. **Population – specific, biogeocenotic and biosphere levels of the alive.**	2semester 88hours/ 2,9 credits	Lectures № 6-10 Practical classes №№ 31-60 Topics for self- study №№_38-85_____

The course includes 30 topics, which are divided into 8 thematic modules.

Part I . Biological features vital activity of human life. Organisms level organization of alive. Bases of human genetics.

Contents part 1. Molecular – cells levels organization of the alive.
Topic 1. Introduction to Medical Biology Course. Review of living levels. Optical instruments in biological investigations.
Topic 2. Morphology of a cell. Structural components cytoplasm and nucleus. Cells membranes. Transport across the cell surface membrane.
Topic 3. Nucleus. Morphology of chromosomes. Human karyotype. Characteristics of nucleic acids.
Topic 4. Classification of genes. Structure of prokaryotic and eukaryotic genes.
Genes structural, control (regulation) tRNA, rRNA Regulation of genes' expression.
Topic 5. Cell reproduction. Cell cycle. Types of the cell division. Gametogenesis.

Contents part 2. Patterns of heredity and variability.
Topic 6. Organism level realization genetic information. Features of genetics of the man. Display of the basic laes of inheritance on an example of Mendilian traits(mono-and polyhybrid crossing).
Topic 7. Multiple alleles. Inheritance of human blood groups in ABO system and Rhesus factor. Interaction of allelic and non-allelic genes. Pleiotropy.
Topic 8. Chromosomal theory of linkage. Types of Sex determination. Sex-linked inheritance.
Topic 9. Variability, its forms and manifestations.

Contents part 3. Methods of scientists of hereditary of the human being. Hereditary diseases.
Topic 10. Bases of Medical genetics. Human heredity studying methods.
Topic 11. Cytogenetic method. Chromosomal diseases
Topic 12. Gene diseases. Biochemical method and DNA diagnostics.
Topic 13. Population-statistical method of human genetics. Medical genetic consulting

Contents part 4. Biology of individual development.
Topic 14. Peculiarities of the prenatal (embryonic) period of the human being development. Various abnormalities and their place in human pathology. Postembryonic periods of ontogenesis.
Topic 15. Comprehensive check for part I: Biological features vital activity of human life. Organisms level organization of alive. Bases of human genetics.

Part II. Population – specific, biogeocenotic and biosphere levels of the alive.
Contents part 5. Medical and biological essential of parasitism. Medical Protozoology.
Topic 16. Medical and biological basis of parasitism. Medical Protozoology. Protozoa. Ciliophorea. Class Ciliata are human parasites. Class Lobosea.
Topic 17. Class Zoomastigophora are human parasites. Lamblia, Trypanosoma, Trichomonas, Leishmania.
Topic 18. Phylum Apicomplexa. Class Sporozoa are human parasites.

Contents part 6. Medical helmintology.
Topic 19. Phylum Plathelminthes. Class Trematoda –Liver fluke, Lancet liver fluke, Lung fluke.
Topic 20. Phylum Plathelminthes. Class Trematoda – Cat fluke, Blood flukes, Chinese Liver fluke, Metagonimus, Nanophieus.
Topic 21. Class Cestoidea – pork, beef, dwarf tapeworm.

Topic 22. ClassCestoidea – broad fish tapeworm, echonoccocus, alveococcus are human parasites.
Topic 23. Phylum Nemathelminthes. Class Nematoda – human desiases caused Ascaris lumbricoides, Enterobius vermicularis, Trichocephalus trihiurus, Ancylostoma duodenale and Necator americanus.
Topic 24. Phylum Nemathelminthes. Nematoda – Human diseases caused by Strongyloides stercoralis, Trihinella spiralis, Dracunculus medinensis, different spesies of Filaria genus.

Contents part 7. Medical
Topic 25. Medical Arahnoentomology. Phylum Arthropoda. Class Arachnoidea. Human diseases caused by members of Acarina Family.
Topic 26. Medical Arahnoentomology. Phylum Arthropoda. Class Insecta. Human diseases caused and/or transmitted by members of Anoplura, Aphaniptera, Hemiptera, Blattoidea genuses.
Topic 27. Medical Arahnoentomology. Phylum Arthropoda. Class Insecta. Human diseases caused and/or transmitted by members of Diptera Family
Topic 28. Comprehensive check for contents modules 5,6,7 Medical and biological essential of parasitism. "Medical Protozoology". "Medical Helmintology". "Medical Arahnoentomology".

Contents part 8. Individual and historical development relation. Biosphere and mankind.
Topic 29. Bioshere as a system which keeps up global existence of mankind. Human ecology.
Topic 30. Comprehensive check for part II: Population – specific, biogeocenotic and biosphere levels of the alive.

The topics of the lecture course reveal the problem issues of relevant sections of medical biology.
Practical classes include the theoretical substantiation of the main issues of the topic and assimilation of the following practical skills:

1) identify micropraparations under a light microscope with a small and large magnifications; manufacturing of temporary micro-drugs; differentiation of components of animal cells on electronic microphotographs and figures; identify (schematically) primary protein structure, the amount of amino acids, molecular weight of the polypeptide by a sequence of nucleotides gene that encodes it; solving problems of genetics; to analyze human karyotypes and determine the diagnosis of the most common chromosomal diseases; construction of pedigrees and its genealogical analysis; to distinguish the notion of teratogenic and hereditary innate developmental defects;
2) determination of the place of biological object (pathogens of parasitic diseases) in the system of wildlife; to substantiate the affiliation of parasitic diseases of a person to a group of transmissible and natural-focal; diagnostics on macro and micro-drugs of pathogens and carriers of pathogens of parasitic diseases studied; Justification of methods of laboratory diagnostics of parasitic human diseases and methods of prevention of parasitic diseases, based on the methods of infection.

During practical classes, students are issued protocols of conducted studies in working notebooks, formulate conclusions to the workplace and solve clinically-oriented situational tasks and test tasks.
The independent work of the student envisages preparations for practical classes and development of practical skills, the study of topics for independent out of class work, preparation of presentations, tables, processing of scientific literature and writing reviews from the topics

granted for individual work. The control of the assimilation of the topics of an independent outside of class work is carried out on intermediate control classes and the final control of discipline.

Thematic plans of lectures, calendar plans of practical classes, thematic plan of independent extracurricular work, volume and directions of individual work are published on the site of the department.

The route for obtaining materials: Medical biology department / for students / Full-time education / medicine / 1 course / Educational materials / or through the link https:// https://www.vnmu.edu.ua/ medical biology department#. Access to the materials is carried out through the student's corporate account s000XXX@vnmu.edu.ua.

5. Forms and methods of monitoring academic performance.

Current control in practical studies Поточний контроль на практичних заняттях	Methods: oral or written survey, testing, electronic survey, solving situational problems, conducting laboratory studies, interpreting them and evaluating their results (drawing up a protocol in a workbook)
Control of mastering the thematic section of the discipline at intermediate control classes	Methods: oral or written questioning, electronic testing, solving situational problems, control of practical skills
Final semester control (credit) at the end of 1 semesters	According to the Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/General information)
Final control of the discipline - microbiology (*exam*)	Methods: pre-examination testing, oral questioning (according to the Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/General information)
Learning success diagnostic tools	Theoretical questions, tests, clinically-oriented situational tasks, practical tasks, practical skills demonstration

6. Assessment criteria

Knowledge assessment is carried out in accordance with the Regulations of the Academic process in National Pirogov Memorial Medical University,Vinnytsya(link https://www.vnmu.edu.ua/General information)

Continuous assessment	On a four point system of traditional assessments: 5 «excellent», 4 «good», 3 «satisfactory», 2 «unsatisfactory»
Midpoint separation assessment	On a four-point system of traditional assessments
Control of practical skills	According to the four-point system of traditional assessments
Pass-fail exam (credit)	On a 200-point scale (the arithmetic average grade for the semester is converted into points) Credited: 120 to 200 points Not credited: less than 120 points (See Grading Scale)
Final control of the discipline	*Sum of points for pre-examination testing (12-20 points)*

	and oral questioning (38-60 points) Final exam grade: 71-80 points - "excellent" 61-70 points - "good" 50-60 points - "satisfactory" Less than 50 points - "unsatisfactory" / did not pass
Discipline assessments:	Current academic assessment - from 72 to 120 points (conversion of the average traditional assessment of practical class on a 120-point scale): 60% of the grade for the discipline Final control - from 50 to 80 points: 40% of the grade for the discipline Individual work - from 1 to 12 points From 122 to 200 points in total.

Discipline Score Scale: National and ECTS

The sum of grades for all types of educational activities	Score ECTS	Score on a national scale	
		For exam, course project (work), practice	for credit test
180-200	A	excellent	credited
170-179,9	B	good	
160-169,9	C		
141-159,9	D	satisfactory	
122-140,99	E	satisfactory	-
120-140,99	E	-	credited
119-61	FX	unsatisfactory with the possibility of reassembly	is not credited with the possibility of reassembling
1-60	F	unsatisfactory with a mandatory reexamination of discipline	is not credited with mandatory reexamination of discipline

Criteria for student knowledge assessment

Assessment of oral / written response during the current assessment

The grade "excellent" is given to a student who has deeply and comprehensively mastered the theoretical material, competently and logically teaches it. He is fluent in Latin terminology, clearly answers non-standard questions on the topic of the lesson, is able to link the material of the topic with previously studied sections, which indicates knowledge of the recommended literature and the ability to analyze the material studied, and clearly demonstrates the importance of theoretical knowledge for practicel medicine.

The grade "good" is given to a student who knows and has a good theoretical material, teaches it correctly, does not allow inaccuracies in the answer, is able to reveal the topic from the standpoint of its medical significance and practical application, but the answers do not go beyond the textbook, methodical recommendations.

The grade of "satisfactory" is given to a student who knows the basic concepts and definitions of the studied topic, but admits inaccuracies in the formulation of biological patterns, does not

know how to transform general biological principles on the human body, does not understand the medical aspects of the theme-task.
The grade "unsatisfactory" is given to a student who does not know the theoretical foundations of the theme, practical work, makes gross mistakes in answering, does not master the medical aspects of the theme, has difficulty performing biological experiments, can not explain the importance of theoretical material for practical medicine.

Assessment of practical skills during the current assessment

The grade "excellent" is given to a student who knows the course and sequence of independent scientific-research to perform practical tasks, independently conducts experimental research, identifies elements of creative thinking, seeks the best options for setting up a biological experiment, learns the necessary practical skills correctly, draws up a protocol with clear formulations of generalizations and conclusions.
The grade of "good" is given to a student who admits inaccuracies in the performance of biological research, but is able to identify errors and can demonstrate the implementation of practical skills in general, carefully draws up research results in the protocol of the practical lesson.
The grade of "satisfactory" is given to a student who knows the basics of the practical task, but has difficulty at performing biological research, can not demonstrate the correct sequence of practical skills, can not fully interpret the results of research, sloppy protocol.
The grade "unsatisfactory" is given to a student who cannot demonstrate the performance of practical skills, experiences significant difficulties in performing biological research, violates the procedure for performing practical work, does not register the progress of work in the protocol.

Evaluation of testing during the current assessment

The grade "excellent" is given to the student who at carrying out test control is allowed no more than 5% of incorrect answers (volume of correct answers 95-100%). Provides correct answers to all test questions when solving situational problems.
A grade of "good" is given to a student who makes no more than 20% of mistakes during the test. (volume of correct answers 80-94%). Provides correct answers to 80% of problems when solving situational problems.
The grade "satisfactory" is given to a student who makes mistakes in no more than 35% of test tasks (the amount of correct answers is 65-79%). Solves 60% of situational problems.
A grade of "unsatisfactory" is given to a student who correctly solves less than 65% of the test tasks in a test survey. Solves less than 60% of practical situational problems.

Assessment of intermediate control (credit)

Intermediate control is credited if the student has mastered a first module of the discipline in full, as evidenced by the current assessment of each practical lesson, and attended a lecture course. To assess the intermediate control, the calculation of the arithmetic average mark of the traditional assessment for the semester is performed.

Assessment of independent work of student

The student's independent work is assessed during the current control of the topic in the relevant practical lesson or during the final lessons of mastering the modules of the discipline by oral questioning or solving test tasks on topics that are not included in the plan. Assessment of prepared messages, presentations on the selected topic is carried out by traditional evaluation.
The grade "excellent" is given to a student who has deeply and comprehensively revealed the problem, logically set out the main questions, gave examples from modern medical information sources. He is able to connect the material of this theme with previously studied sections, which

indicates the ability to analyze the studied material, as well as clearly demonstrates the importance of the acquired theoretical knowledge for practical medicine.
The grade of "good" is given to a student who knows and commands well of theoretical material, competently reveals the main questions of the theme and its medical significance, but does not go beyond the textbook, methodical recommendations.
The grade of "satisfactory" is given to a student who revealed the basic concepts and definitions of the recommended theme, but did not fully disclose it, does not understand the medical aspects of the theme, can not relate theoretical material to practice.

Assessment of individual work of student

Carried out on the basis of individual tasks, scientific-practical work, reports on the results of research at the student scientific circle, conferences, competitions in the discipline (criteria for scoring are given in p. 13).

Assessment of the oral answer during the final control (exam)

The grade "excellent" is given to the student competently and in a logical sequence provides answers to the questions of the examination paper. During the answer demonstrates the ability to analyze theoretical material, makes thorough conclusions about the importance of theoretical material for practical medicine, provides clear correct answers to additional non-standard questions. The answers are comprehensive, accurate, clear, error-free, correctly solved practical problems (slide with the parasite and the situational problem of genetics).
The grade "good" is given to a student who has a good knowledge of theoretical material and in a logical sequence provides answers to the questions of the examination paper, but admits minor inaccuracies, which are quickly corrected when answering clarifying questions of the examiner. Solves practical problems correctly, experiencing certain difficulties in the most difficult cases.
A grade of "satisfactory" is given to a student who demonstrates knowledge of basic concepts and definitions when answering the examination paper, admits significant inaccuracies that partially affect the overall understanding of the problem; when performing practical tasks makes significant mistakes.
The grade "unsatisfactory" is given to a student who does not know the answer to one of the questions of the examination paper, makes gross mistakes when answering other questions. Did not perform practical tasks (did not solve the situational problem and did not describe the slide with the parasite). Does not know the answers to additional clarifying questions of the examiner.

The calculation of individual points is carried out on the basis of the Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/General information).
12 points - added to the assessment of the discipline for a student who won a prize at the interuniversity competitions in the discipline or a prize at the Ukrainian competition of student research reports or a prize at the interuniversity / international scientific conference with the published work;
11 points - are added to the assessment of the discipline for a student who won the first prize at the intra-university Olympiad in the discipline or the first place at the student scientific conference with the published work, or participated in the Ukrainian competition of the student research papers;
10 points - are added to the assessment of the discipline for a student who won a prize (II-III) at the intra-university Olympiad in the discipline or at the student scientific conference with the availability of printed work; or for participation (without a prize place) in interuniversity competitions in the discipline or a prize place in an interuniversity / international scientific conference with the availability of the published work.

9 points - are added to the assessment of the discipline for a student who participated (without a prize) in the intra-university Olympiad in the discipline or student scientific conference with the presence of the published work.
8 points - are added to the assessment of the discipline for a student who actively participated in the student scientific group, published a paper with results of scientific and practical research, but did not personally participate in the student scientific conference, prepared a poster report.
6-7 points - are added to the assessment of the discipline for a student who has made at least 20 micropreparations or at least 3 tables, or an educational video to replenish the visual support of teaching the discipline (taking into account the volume and importance of work performed).
The current success of students is calculated for the entire course of the discipline and determines the average value of the traditional assessment, which is converted into rating points according to a 120-point scale according to the decision of the Academic Council of National Pirogov Memorial Medical University, Vinnytsya protocol №2 from 28.09.10.
The current success rate is calculated according to a 120-point scale - from 72 to 120 points.

7. Policy of discipline / course

The student has the right to receive high-quality educational services, access to contemporary scientific and educational information, qualified tutoring during the study of discipline and mastering practical skills. The policy of the department during the providing of educational services is a student-centered, based on normative documents of the Ministry of Education and the Ministry of Health of Ukraine, the Statute of the University and the Procedure for the Providing of Educational Services regulated by the main principles of the organization of the educational process in National Pirogov Memorial Medical University,Vinnytsya and the principles of academic integrity (link https://www.vnmu.edu.ua/General information).

Adherence to the rules of VNMU, safety techniques in practical classes.
Instruction on biosafety, safety of handling chemical reagents and burners is conducted at the first practical lesson by the teacher. The instructed students are registered in the Safety Instruction Journal. A student who has not been instructed is not allowed to perform practical work.

Requirements for preparation for practical classes.
The student should be prepared for a practical lesson, test tasks for the current topic should be solved in a workbook, diagrams and tables are filled.
A student should come to class on time, without delay. A student who is more than 10 minutes late is not allowed to the practical class and must work it in the prescribed manner.
In practical classes, the student must be dressed in a work uniform (medical gown, hat). Students who do not have a work uniform are not allowed to practice.
The student must follow the rules of safety in practical rooms and at the department.
When discussing theoretical questions, students should demonstrate tolerance, courtesy and respect for their colleagues and the teacher; when performing practical tasks, the workplace should be kept in order and be cleaned after performing practical work.

Use of mobile phones and other electronic devices. The use of mobile phones and other electronic devices in the classroom is allowed only during electronic testing or surveys.

Academic integrity. When studying the discipline, the student must be guided by the Code of Academic Integrity and Corporate Ethics of National Pirogov Memorial Medical University, Vinnytsya (link : https://www.vnmu.edu.ua/General information)/ Code of Academic Integrity).
In case of violation of the norms of academic integrity during the current and final controls student receives a grade of "2" and must rework it to his teacher in the prescribed manner within two weeks after receiving an unsatisfactory assessment).
Missed classes. Missed classes are working out in the manner prescribed by Regulations of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link

https://www.vnmu.edu.ua/General information) at the time of work out schedule (published on the website of the department https://www.vnmu.edu.ua/ Department of Medical biology) to the teacher on duty. To work out missed lesson student must provide a completed workbook protocol on the relevant theme, take a test and answer questions in writing or orally to the theme of the lesson. The reworking of missed lectures is carried out after providing a thesis of lecture material, or writing an abstract, or preparing own presentation on the theme of missed lecture.

The procedure for admission to the discipline final control is given in the Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/General information). Students who do not have missed practical classes and lectures and received an average traditional grade of at least "3" are allowed to final control.

Additional points. Individual points in the discipline that student can receive for individual work, is determined by the results of his individual work according to Regulation of the Academic process in National Pirogov Memorial Medical University, Vinnytsya (link https://www.vnmu.edu.ua/General information) and policy of the course.

Conflict resolution. In case of misunderstandings and complaints to the teacher because of the quality of educational services, knowledge assessment and other conflict situations, student should submit his / her claims to the teacher. If the issue is not resolved, the student has a right to apply to the head of the department according to Complaints Consideration Procedure (https://www.vnmu.edu.ua/ General information / Basic documents).

Politics in terms of remote learning. Distance learning regulated by the Regulations of the elements of remote learning in National Pirogov Memorial Medical University, Vinnytsya (https://www.vnmu.edu.ua/ General information). The main training platforms for studying are Microsoft Team and Google Meets. Practical classes and lectures, exercises and consultations during distance learning is published on the website of the department (https://www.vnmu.edu.ua/ Department of Microbiology / Student or https://www.vnmu.edu.ua/Department of Microbiology / News).

Feedback from teachers is via messengers (Viber, Telegram, WhatsApp) or e-mail (at the teacher's choice) during working hours.

Feedback whit the teacher is via messengers (Viber, Telegram, WhatsApp) or e-mail (at the teacher's choice) during business hours.

8. Educational resources Educational-methodological support of the discipline is published on the website of the department. Route of receiving materials https://www.vnmu.edu.ua/ Department of Medical Biology / Student.

Educational resources:

1. Medical Biology / Ed. V.P. Pishak, Yu.I. Bazhora. Textbook / 3rd Edition, revised and supplemented. - Vinnytsia: New book, 2017. - 608p.

Recommended reading:

1. Medical parasitology. Atlas / Ed. Yu. I. Bazhora. - Odessa: ONMU, 2001 .-- 110 p.
2. Fundamentals of medical parasitology / Ed. Yu. I. Bazhora. - Odessa: ONMU, 2001 .-- 175 p.
3. Bochkov N.V., Puzyrev V.P., Smirnikhina S.A. Clinical Genetics / Textbook under. ed. acad. N.P. Bochkova. - 4th ed. - M .: GEOTAR-media, 2011 .-- 592p.
4. Collection of tasks for preparation for the license test exam in natural sciences "Krok-1. General medical training "/ Col. avt .; For the general ed. prof. V.F. Moskalenko, prof. O.P. Volosovets, prof. I.E. Bulakh, prof. O.P. Yavorsky, prof. O.V. Romanenko, Assoc. L.I. Ostapyuk. - K .: Медицина, 2004. - 368 p .; Pp. 9-41.
5. Kovalchuk L.E., Telyuk P.M., Shutak V.I. Human parasitology: Textbook. - Ivano-Frankivsk: Lily, 2004; pic.
6. Medical Biology: A Guide of Practical Lessons / O.V. Romanenko, M.G. Kravchuk and others. For order. O.B. Romanenko. - K .: Health, 2005. - 372 p. With pic.

7. Medical Genetics: Textbook / Ed. Corresponding Member Academy of Medical Sciences of Ukraine, Prof. O.Ya. Grechanina, Prof. R.V. Bogatyreva, prof. O.P. Volosovets. - Kyiv: Medicine, 2007. - 536 p.
8. Newssbaum R.L., McNeanes R.R., Willard H.F. Medical genetics: textbook. Benefit / Robert. L. Newssbaum, Roderick R. McNinnes, Huntington F. Willard: translated from English. A.Sh. Latyshova: under. ed. N.P. Bochkova. –M .: GEOTAR-Media, 2010. -624 p .; pic.
9. Pavlichenko V.I., Pishak V.P., Bulyk R.E. Fundamentals of Molecular Biology: A Textbook. - Chernivtsi: Med University, 2012. - 388 p .; pic.
10. Pishak V.P., Zakharchuk O.I. Medical biology, parasitology and genetics. Workshop. Kind. 2nd - Chernivtsi: 2012. - 632 p .; pic.
11. Pishak V.P., Bazhora Yu.I., Volosovets O.P., Bulyk R.E. Parasitic diseases in children. - Chernivtsi: BSMU, 2007. - 452 p.

Electronic resources:

1. University website - www.vnmu.edu.ua
2. Library website - library.vsmu.edu.ua
3. Test Center - base license tests "Krok- 1» http://testcentr.org.ua/
4. OMIM (Online Mendelian Inheritance in Man) - An Online Catalog of Human Genes and Genetic Disorders http://omim.org/
5. Elements: News of science http://elementy.ru/
6. The knowledge base of human biology http://humbio.ru/

4) Presentations of lectures, Methodical recommendations before practical ones to take the IWS, Consultations (two times a week, the graph of consultations).

4. **The timetable and distribution of groups with assigned teachers** are published on the web page of the department ((https://www.vnmu.edu.ua / Department of Medical biology / To students).

5. **Questions to the intermediate and final semester control (credit)** of the discipline are published on the web page of the department (https://www.vnmu.edu.ua/ Department of Medical biology / To students).

The syllabus of the discipline "Medical biology" was discussed and approved at the meeting of the department Medical Biology (record № 1, dated "27" серпня 2020)

Responsible for the academic discipline "Medical biology"

Head of the Medical Biology department Shkarupa V.M.