

# SYLLABUS

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INTERNATIONAL EUROPEAN  
UNIVERSITY



**SCHOOL OF  
MEDICINE**















**Medical biology**

**2021**



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Subject matter: 			
	 Medical biology		
Lecturer: 			
	 Associate professor of the department of fundamental disciplines Bondarenko Oleksandr		
Lecturer's profile 			
	 <a href="https://medicine.ieu.edu.ua/pro-yemsh/kafedry/kafedra-fundamentalnykh-dystsyplin">https://medicine.ieu.edu.ua/pro-yemsh/kafedry/kafedra-fundamentalnykh-dystsyplin</a>		
Consultations			
On-campus	 The second Monday of the month from 15:00 to 16:00		
Online consultations	 The third Wednesday of the month from 15:00 to 16:00		
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Discipline page 			
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Form of final control	final test	Grading test	exam
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>



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## 1 Subject matter summary

Medical biology lays the foundation for further mastering by students knowledges and skills from profile theoretical and clinical professional and practical disciplines (biological and bioorganic chemistry, histology, cytology and embryology, physiology etc.)

## 2 Background of studying the subject matter

According to the curriculum, the discipline "Medical Biology" is studied by students in the 1st year, in the first and second semesters. The discipline is based on previously studied in secondary school subjects such as: "General Biology", "Human Biology", "Animal Biology", "Plant Biology".

## 3 Goal and objectives of the subject matter

The study of medical biology forms in students a holistic idea of the general patterns of development of living nature; about the essence of life, its forms, individual and historical development of the organic world and the place of man in it; about the forms of biotic connections in nature, life cycles of parasites and parasitic human diseases; about the place of man in the biosphere; provides fundamental biological training and acquisition practical subsequent professional activity of a general practitioner. The knowledge that students receive from the discipline provides a unit natural-scientific and professional-practical training.

## 4 Study results

Ability to establish the most probable or syndromic diagnosis of the disease and prescribe laboratory and / or instrumental examination of the patient - due to hereditary and parasitic diseases, identify risk factors the occurrence and course of the disease, to determine the negative environmental factors (assessment of the impact of economic and biological determinants on the health of the individual)

## 5 ECTS credits

5 ECTS credits = 150 hours over 2 semesters. 16 hours of lectures, 56 hours of practical classes, 78 hours of independent work.

## 6 Subject matter structure

Topic	Amount of hours		
	lec.	pr. clas.	ISW
<b>Chapter I.</b>			
<b>Content Module 1. Biological features of human vital activities.</b>			
<b>Molecular-genetic level of life organization</b>			
Topic 1. Levels of living matter organization. Optical systems in biological investigations. Non-cellular and cellular forms of life		2	3
Topic 2. . Cell morphology. Structural components of the cytoplasm		2	3

6 Subject matter structure

Topic	Amount of hours		
	lec.	pr. clas.	ISW
Topic 3. Cell membranes. Transport across the cell surface membrane (plasmolemma).	2	2	3
Topic 4. Chromosomes morphology. Human karyotype.		2	3
Topic 5. Characteristic of nucleic acids. The organization of the information flow in cell.		2	3
Topic 6. Genes structure in pro- and eukaryotes. Structural and regulatory genes. Processes of genetic information realization.		2	3
Topic 7. Cell cycle. Mitosis. Reproduction – the basic property of living matter. Meiosis.		2	3

**Chapter II.**

**Content module 2. Organism level of life organization.**

**Fundamentals of human genetics**

Topic 8. Peculiarities of human genetics. Basic patterns of human mendelian traits inheritance (mono-, di- and polyhybrid crosses).	2	2	3
Topic 9. Allelic gene's interactions. Phenomena of pleiotropy. Non-allelic gene's interactions.		2	3
Topic 10. Linkage inheritance. Genetics of sex. Sex-linked inheritance		2	3
Topic 11. Study of twins. Genealogy of human as the method of human inheritance investigation.	2	2	3
Topic 12. Gene's and chromosomal diseases.		2	3
Topic 13. Cytogenetics and biochemical analysis of the human being.		2	3
Topic 14. Biological features of human reproduction. Gametogenesis.	2	2	3
Topic 15. Peculiarities of prenatal period of human development. The possibility of prenatal transmission of the virus in HIV-infected pregnant women.		2	4
Topic 16. Postnatal period of ontogenesis.		2	4



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## Subject matter structure

Topic	Amount of hours		
	lec.	pr. clas.	ISW
<b>Chapter III. Content module 3. Population, species, biogeocenotic and biospheric levels of living matter organization</b>			
Topic 17. Medical Protozoology. Phylum Sarcomastigophora, Classis Lobozea. Phylum Ciliophora. Classis Rimostomatea.	2	2	2
Topic 18. Representatives of the Classis Zoomastigophora – human parasites. Phylum Apicomplexa. Representatives of the Classis Sporozoa – human parasites.		2	2
Topic 19. Phylum Flat worms (Platyhelminthes). Classis Trematoda: liver and lancet-like flukes. Classis Trematoda: cat's, lung and blood flukes	2	2	2
Тема 20. Тип Плоскі черви. Клас Стъожкові – збудники захворювань людини (1 частина)		2	2
Topic 21. Classis Cestoidea: echinococcus, alveococcus, broad tapeworm		2	2
Topic 22. Phylum Round worms (Nemathelminthes). Classis Nematoda: large intestinal roundworm, pinworm (seatworm) and whipworm – the causative agents of human diseases.		2	2
Topic 23. Phylum Round worms (Nemathelminthes). Classis Nematoda: Strongiloides stercoralis, Ancylostoma duodenale, Trichinella spiralis the causative agents of human diseases.	2	2	2
Topic 24. Phylum Arthropoda. Classis Arachnoidea. Ticks (Acarina) are activators and vectors of human diseases.		2	2
Topic 25. Classis Insecta: Diptera – the carriers of human infections and invasions.		2	3
Topic 26. Classis Insecta: lice (Anoplura), fleas (Aphaniptera), are activators and vectors of human diseases.	2	2	3
Topic 27. Synthetic theory of evolution. Population structure of mankind. Phylogenesis of the cardiovascular systems of Vertebrates. Ontophylogenetic reasons		2	3
Topic 28. Biosphere as a system which keeps up global existence of mankind. Human ecology.		2	3
<b>Total for disciplines - 150</b>	<b>16</b>	<b>56</b>	<b>78</b>



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## 7 List of obligatory tasks

Organization for matter and energy flow in the cell.  
The life of cells outside the organism. Cell cloning.  
Genetic maps. Methods of the human chromosomes mapping.  
The modern state of human genome investigation.  
Genetic risk of the environmental pollution. The concept of antimutagens and comutagens.  
Mutagenic properties of retrovirus HIV.  
Genetic engineering. Biotechnology. Concept about genetherapy.  
Methods of human genetics: dermatoglyphics, immunologic, somatic cells hybridization.  
The notion about biofields, biological rhythms and their medical importance.  
Regeneration and its types: physiological and reparative. The importance of the regeneration system for homeostasis.  
Transplantation and the immune system. Achievements of transplantology.  
Methods of laboratory diagnosis of diseases caused by protozoa parasites.  
Blood flukes – the causative agents of parasitic diseases of human. Agents of metagonimosis and nanophoetosis.  
Guinea worm and Filaria – agents of human diseases.  
Phylum Mollusca (Mollusks). Characteristic of intermediate hosts of helminthes.  
Ticks and mites of human home or apartment and their medical importance.  
Midges and it components: characteristic, importance as the intermediate hosts of helminthes and vectors of human infections.  
Cockroaches and bedbugs: their species, medical importance.  
The relationship of onto- and phylogenesis. Biogenetic law (F. Muller, E. Haeckel), it interpretation by O. Severtsov.  
Origin of human. Human races as the reflection of the adaptive patterns of human development.  
Poisonous plants and animals for human.

## 8 List of selective tasks

1. Creating multimedia presentations on the topics of practical classes
2. Creating biological crossword puzzles on the topics of practical classes
3. Making tables
4. Participation in the work of the student scientific circle
5. Participation in the student olympiad in the discipline
6. Participation in student scientific - practical conferences
7. Organization and visiting of thematic museums
8. Publication of abstracts of scientific conference reports in co-authorship with the teacher

## 9 Subject matter features

Period of teaching	Semester	International discipline integration	Year of study	Courses: general training/ professional training/ elective
1 year, 2 semesters	I - II	available	1 year	General training course

## 10 Assessment system and requirements

Discipline is evaluated in accordance with the European credit transfer system which is designed for a single pan - European approach to assessing and comparing student achievement, which study in various institutions of higher education.



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## Assessment system and requirements

Requirements for the written work (if any), laboratory/practical training/ seminars etc.

All lectures and practical classes must be recorded in the synopsis and album that the teacher certifies at each lesson.

Conditions for admission to final control

The conditions of admission to the final control are working out all classes with a grade not less than 3 points on a 4-point system.

<https://ieu.edu.ua/docs/rate-of-study.pdf>

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## Subject matter policy

Basic principles of classes:

- openness to new and extraordinary ideas, tolerance, friendly partnership atmosphere of mutual understanding and creative development;
- all tasks provided by the program must be completed in a timely manner;
- to achieve the goals of training and successful completion of the course, it is necessary from the first day to be actively involved in work, regularly attend lectures and practical classes, read protocols for practical classes, not be late for classes, come to class in medical white coat and stay in a classroom without outer clothing and hat (if necessary to cover the head it is allowed to wear a medical cap). The student must complete all the necessary tasks in class, work daily on self-improvement and be able to work in a team in a mini-group. Different models of work in the classroom, including work on solving problems gives the opportunity to reveal their own potential, learn to trust their partners, to develop skills of intellectual work in a team.
- the course involves intensive use of mobile learning technologies and information exchange in joint groups of mobile messengers, which allows students and teachers to communicate with each other at any time convenient for them, and for students who are absent from classes to get the necessary information and present completed tasks. On the other hand, students should exclude the possibility of using a mobile phone during tests and checking homework, tablet or other mobile devices, do not resort to writing and plagiarism, adhere to cooperation and solidarity of teacher and students, ask the teacher for help and consultations on scientific, research and research work, to take part in scientific circles;
- It is forbidden to come to classes with a sharp tobacco smell. If a student smokes, the odor must be eliminated and student have to wear protective medical mask throughout the class;
- Throughout the course, students' autonomous skills are actively developed, which can prepare additional information on a topic that is not included in the list of topics of practical classes of content modules and make a presentation or additional information.

The teacher, in turn, must ensure the full implementation of the curriculum, not to be late for lectures, practical (seminar) classes, to objectively assess the knowledge and practical skills of students. It is important to prevent any manifestations of corruption, to pay special attention to students in practical classes while working with the equipment, to prevent discrimination regardless of race, ethnicity and religious beliefs.

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## Policy of absence and late task performance

Students who miss current control for valid reasons confirmed by documents have the right to take current control within two weeks after returning to studying.

Students who have missed classes without valid reasons, have not participated in current control activities, have not liquidated academic failure are not admitted to final semester control of this discipline. In this case, an academic staff member puts a mark 'non-admission' in the exam record.

Repeated taking of the grading exam of the discipline is appointed in case of accomplishing all types of educational, individual work stipulated by the working program of the academic discipline and is carried out according to the approved schedule of academic failure liquidation.

<https://ieu.edu.ua/docs/050.pdf>



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## 14 Academic honesty policy

Participants of the educational process rely on the academic integrity principles  
<https://ie.u.edu.ua/docs/011.pdf>

## 15 Recommended information sources

1. Bihunyak T.V. Medical biology / T.V. Bihunyak. – Ternopil: TSMU Ukrmedknyha, 2010. – 214 p.
2. Medical biology : [textbook for 1st year students of medical and pharmaceutical faculties of higher educational establishments of Ukraine] / Yu. I. Bazhora, R. Ye. Bulyk, M. M. Chesnokova [et al.] – 2nd ed., revis. and updat. – Vinnytsia : Nova Knyha, 2019. – 446 p.
3. Pishak V., Grytsiuk M., Bulyk R. Medical Biology (I. Cytology, II Medical Genetic. – Manual for foreign students). – Chernivtsi, 2006.
4. Romanenko O.V. Medical biology: The study guide of the practical classes course / O.V. Romanenko, O.V. Golovchenko, M.G. Kravchuk, V.M. Grinkevych; Edited by O.V. Romanenko. – K.: Medicine, 2008. – 304 p.
5. Lazarev K.L. Medical Biology: Textbook. – Second edition. – Simferopol: IAD CSMU, 2003. – 592 p.
6. Scientific Bulletins of the Institute of Molecular Biology and Genetics <https://imbg.org.ua/uk/journals/>
7. The Bulletin of Vavilov Society of Geneticists and Breeders of Ukraine <http://utgis.org.ua/ua/2010-ua>
8. Journal of Bioanalysis & Biomedicine  
<https://www.hilarispublisher.com/scholarly/medical-biology-journals-articles-ppts-list-273.html>
9. Journal of Medical and Biological Science Research  
<https://www.pearlresearchjournals.org/journals/jmbsr/>

## 16 Tips on successful study at the course

Be active, persistent, inquisitive, consistent, prepare yourself at home for practical classes and on the topics of independent work Solve tests and tasks independently, actively work in class.