

SYLLABUS

INTERNATIONAL EUROPEAN
UNIVERSITY



**SCHOOL OF
MEDICINE**

**Microbiology, virology
and immunology**

2021



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Discipline

 Microbiology, virology and immunology

Teacher

 Rybalchenko Natalia Pavlivna

Teacher profile

 <https://medicine.ieu.edu.ua/pro-yemsh/kafedry/kafedra-fundamentalnykh-dystsyplin>

Consultations

Очні консультації  third Thursday of the month from 15:00 to 16:00

Онлайн консультації  second Wednesday of the month from 15:00 to 16:00

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Discipline page



The form of final control	test	differentiated scoring	exam
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1 A brief abstract of the discipline

"Microbiology, virology and immunology" lays the foundation for the formation in the future of the following program results of training in accordance with the Standard of Higher Education of Ukraine to train specialists of the second(master's degree) level of the specialty "Medicine"

2 Prerequisites for the study of discipline

The course "Microbiology, virology and immunology" is based on knowledge of the main natural and scientific disciplines: medical biology, medical and biological physics, biological and bioorganicchemistry, human anatomy, histology, cytology and embryology, Latin, medical history, philosophy and integrates with these disciplines.

3 Purpose and objectives of the discipline

The purpose of the discipline follows from the goals of the educational and vocational training program for graduates of higher education institutions and is determined by the content of those systemic knowledge and skills that the doctor mustmaster.

The study of the discipline "Microbiology, Virology and Immunology" lays the foundations for students to study general hygiene, epidemiology, pathological physiology, pathological anatomy, immunology and allergology, infectious diseases, internal diseases, surgicaldiseases and pediatric diseases and other clinical disciplines, which involves the integration ofteaching with these disciplines and the application of knowledge in microbiology, virology and immunology in the future. and activities.

4 Learning Outcomes

Ability to analyze the biological properties of pathogenic and non-pathogenicmicroorganisms, viruses and patterns of their interaction with macroorganism, with human population and externalenvironment.

- Ability to interpret the basic mechanisms of formation of the immune response of the human body.
- Ability to determine the main types of pathological reaction of the immune system and the relationship with the occurrence of the most common human diseases.
- Ability to determine methods of microbiological and virological diagnostics, etiotropic therapy and specific preventionofinfracation diseases.

5 Loans

270 hours, 9 credits of EDS are given to study the discipline. The program of the discipline "Microbiology, Virology and Immunology" is structured into 2 sections, which include blocks of content sections.

Section I: 120 hours 4.0 EDS credit.

Section 2: 150 hours 5.0 credit EDS.

6 Structure of academic discipline

Title of meaningful sections and topics	Number of hours		
	1	1	s.r.

SECTION I. Morphology and physiology of microorganisms. Infection. Immunity.



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Structure of academic discipline

Title of meaningful sections and topics	Number of hours		
	1	1	s.r.
<i>Meaningful section 1, 2. Introduction to microbiology Morphology and structure of prokaryotes and parasitic unicellular neucariotes.</i>			
Theme 1. Organization of work in bacteriological, immunological and virology laboratory.	2	2	5
Theme 2. Morphology of bacteria.		2	5
Theme 3. Methods of microscopy.	2	2	5
Theme 4. Dyes and methods of manufacture of drugs. Simple methods of coloring bacteria.		2	5
Theme 5. The structure of the bacterial cell.	2	2	5
Theme 6. Coloring bacteria using the Gram method and other complex methods of painting.		2	5
Theme 7. Morphology of spirokhet, actinomycetes, fungi and pathogenic protozoa.	2	2	5
<i>Table of Contents Section 3. Physiology of microorganisms (prokaryotes). Evolution and classification of microorganisms.</i>			
Theme 8. Physiology of bacteria. Nutritional environments.	2	2	5
Theme 9. Sterilization and disinfection.		2	5
Theme 10. Growth and reproduction of microorganisms. Allocation of pure aerobic crops.	2	2	5
Theme 11. Growth and reproduction of microorganisms.		2	5
<i>Table of Contents Section 4. Genetics of microorganisms. Table of Contents Section 5. Microbiological bases of antimicrobial chemotherapy.</i>			
Theme 12. Genetics of bacteria. Chemotherapeutic drugs. Antibiotics		2	5
<i>Table of Contents Section 6. Infection</i>			
Theme 13. Infectious process. Modern methods of diagnosis of infectious diseases.	2	2	5
<i>Table of Contents Section 7. The immune system of the body. Reactions of nonspecific protection of the body from microorganisms. Table of Contents Section 8. Antigens. Antibodies. Table of Contents Section 9. Immunity reactions. Immunopathology.</i>			
Theme 14. Organs of the human immunesystem.		2	5



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Structure of academic discipline

Title of meaningful sections and topics	Number of hours		
	1	1	s.r.
Theme 15. Antigens. Antibodies. Serological reactions. Serological reactions with labels	2	2	5
Theme 16. Vaccines and immune serums.		2	5

SECTION 2. General and special virology. Pathogenic prokaryotes, deucariotes, fungi.

Table of Contents 10. General Virology

Theme 17. Morphology and ultrastructure of viruses.	2	2	5
Theme 18. Cultivation of viruses in the chicken embryo and the body of laboratory animals.		2	5
Theme 19. Cultivation of viruses in cell cultures. Indication of viral reproduction. Serological reactions in virology	2	2	6
Theme 20. Genetics of viruses. Bacteriophaga. Practical use.		2	6

Table of Contents Section 11. Special virology.

Theme 21. Ortomixoviruses, paramyxovirus. Picornavirus. Enterovirus	2	2	6
Theme 22. Retroviruses. AIDS. RNA-genomic viruses: reoviruses, arenaviruses, rabdovirus. Herpesvirus, adenovirus. Hepatitis viruses		2	6
Theme 23. Vesicular stomatitis virus, togaviruses, filoviruses, coronaviruses.		2	6

Table of Contents Section 12. Pathogenic prokaryotes and deucariotes.

Theme 24. Staphylococcus. Streptokoky. Meningococy.	2	2	6
Theme 25. Salmonella. Typhoid fever.		2	6
Theme 26. Vibrios. Cholera. Corynebacteria. Diphtheria. Bordeletes. Pertussis. Mycobacteria. Tuberculosis. Leprecha	2	2	6
Theme 27. Anaerobes. Botulism. Odoantroponoses. Plague. Brucelosis. Tularemia. Anthrax		2	6
Theme 28. Ricketthia. Rash fever.	2	2	6
Theme 29. Spirokhets. Syphilis. Reverse tiff. Boreliosis. Leptospirosis.		2	6
TTheme 30. Pathogenic fungi. Microbiological diagnosis of mycoses.		2	6



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6 Structure of academic discipline

Title of meaningful sections and topics	Number of hours		
	1	1	s.r.

Table of Contents Section 13. Fundamentals of clinical and ecological microbiology.

Table of Contents Section 14. Sanitary microbiology and virology

Theme 31. Clinical microbiology. Normal microflora of the body. Dysbiosis. Correction. Intracrysalinfections.	2	2	6
Theme 32. Sanitary microbiology. Microflora of water and air. Sanitary microbiology. Microflora of soil and food products.		2	6
TOTAL IN DISCIPLINE	32	64	174

7 List of mandatory tasks

1. The main features and trends in the development of modern microbiology.
2. Dependence of the results of coloring microorganisms on their properties. Theories explaining the mechanism of painting according to Gram of various microorganisms. Methods for identifying structural elements of bacteria: spores, capsules, flagella, inclusions, etc.
3. Methods of study of morphology of fungi and actinomycetes.
4. Modern nutrient environments for growing bacteria.
5. Test systems to determine the enzymatic activity of microorganisms. The origin and evolution of microorganisms.
6. Basic principles of microorganism taxonomy.
7. Modern classification of prokaryotes. Growth and method of reproduction of bacteria, phases of reproduction of bacteria culture in stationary conditions. Criteria for identifying microorganisms.
8. Classification of microorganisms, basic taxonomy. Characteristics of the species.
9. Characteristics of cellular-tissue, physiological and humoral factors of nonspecific protection. Principle and essence of polymerase chain reaction.
10. History of discovery and the main stages of virology. The contribution of domestic scientists. Methods of studying viruses, their assessment.
11. Modern views on the nature and origin of viruses. Place viruses in the system alive.
12. Principles of virus classification and their evaluation.
13. Bacteriophages, morphology and structure. Methods of qualitative and quantitative determination of bacteriophages.
14. Nonspecific factors to protect macroorganism from viral agents, their characteristics. Interferons, mechanism of action, interferonogens.
15. Scarlet fever. Streptococcus pneumoniae. Enterococci. Anaerobic staphylococcus and streptococcus.
16. General characteristics of other members of the family of neisseriae: moraxella genera, acinetobacter, klebsiella, their role in human pathology.
17. Salmonella classification by Kaufman and White.
18. Comparative properties of pathogenic protozoa. The causative agent of amoebic dysentery.
19. Paratyphoid vibrios, properties. Role in human pathology.
20. Bacterial whooping cough. Hemophilus influenzae. Legionella



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7 List of mandatory tasks

21. Non-prolific gram-negative anaerobic bacteria of genera: bacteroids, fusobacterium.
22. Anaerobic coccid genera Peptococcus and Peptostreptococcus.
23. Anaerobic bacteria of the genus Veillonella.

8 List of selective tasks

1. Creating multimedia presentations on practical training topics
2. Creation of biological crossword puzzles on the topics of practical classes
3. Making tables
4. Participation in the student scientific circle
5. Participation in the Student Olympiad in discipline
6. Student's ass in student scientific and practical conferences
7. Organization and visits to thematic museums
8. Publication of theses reports of the scientific conference in co-authorship with the teacher

9 Signs of discipline

Term of teaching	Semester	International disciplinary integration	Course of the year (training)	Cycles: General Training/ Training/ Free Choice
1 year old	III, IV	yes	2 course	General Training Cycle

10 Assessment system and requirements

The current success of students is estimated on a 4-point scale (2; 3; 4; 5) at each practical level, taking into account the approved evaluation criteria for the relevant discipline. The student must receive an assessment on each topic for further conversion of grades into scores on a multi-point (200-point) scale.

Evaluation criteria for current academic activities:

Excellent ("5") – the student correctly answered 90-100% of the questions.

Good ("4") - the student correctly answered 70-89% of the questions.

Satisfactorily ("3") - the student correctly answered 50-69% of the questions.

Unsatisfactory ("2") - the student correctly answered 50% of the questions.

Evaluation of students' independent work on preparation for classroom practical classes is carried out during the current control of the topic at the appropriate classroom.

The semester score is rated on a two-point scale (enrolled/not counted) and on a 200-point scale by determining the average arithmetic current score for each practice session on a 4-point scale and its subsequent conversion into 200-point scores.

The final control of knowledge in the discipline "Medical Informatics" is carried out in the form of a differentiated test.

QR Code: <https://ie.u.edu.ua/docs/rate-of-study.pdf>

11 Conditions of admission to final control

Students who have completed all types of work, tasks provided for by the curriculum for a semester in accordance with the academic discipline are allowed to complete the semester final control, visit all classes provided for by the curriculum, have written and passed the medical history and have an average score for the current academic activity of at least "3" (72 points on a 120-point scale).

QR Code: <https://ie.u.edu.ua/docs/rate-of-study.pdf>



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12 Discipline policy

The basic principles of the classes:

- openness to new and extraordinary ideas, tolerance, friendly partner atmosphere of mutual understanding and creative development;
- all tasks envisaged by the program must be completed within the deadline;
- various models of work in the classroom, including work on solving problems, enables higher education applicants to reveal their own potential as widely as possible, learn how to trust their partners, develop intellectual skills in the team;

13 Policy on skipping classes and performing a deposit later than the deadline

The student, who, for good reasons, confirmed documented, was not subject to the current control of the masses the right to undergo current control within two weeks after returning to study.

A student who was absent from classes without valid reasons, did not participate in the current control, did not eliminate academic debt, is not allowed to final semester control of knowledge in this discipline, and on the day of passing the exam in the examination information, the scientific and pedagogical staff is assessed "unacceptable". independent (individual) work provided for by the working curriculum of the discipline and is carried out in accordance with the schedule of liquidation of academic debt approved by the rector.

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

14 Academic Integrity Policy

Participants of the educational process are guided by the principles of academic integrity

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

13 Recommended sources of information

Basic:

1. Medical microbiology, virology and immunology ": a textbook for university students / Andrianova TV, Bobir VV, Vinograd VO [etc.]; for order VP Широбокова. - Vinnytsia: "New Book", 2011 - 951p.
2. Medical microbiology, virology and immunology: a textbook for students. Higher. Honey. Textbook. institutions: translation from Ukrainian. editions / [Andrianova TV, Bobyr VV, Vinograd NA etc.]; under ed. VP Shirobokova. - Винница: Нова книга, 2015. - 856 с.

Additional:

1. Danileichenko VV Microbiology with the basics of immunology: a textbook for medical universities / VV Danileichenko, JM Fedechko, OP Korniychuk. - 2nd ed., Reworked. and ext. - Kyiv: Medicine, 2009. - 391 p.
2. Practical microbiology: Handbook / SI Klimnyuk, IOSitnyk, MS Tvoriko, VP Широбоков. - Ternopil, Ukrmedknyha. - 2004. - 440p.
3. Shirobokov VP. Microbial ecology of man with color atlas. Textbook. / VP Shirobokov, DS Yankovsky, GS Diment. - K: ООО «Червона Рута-Турс», 2010, - 340 с.
4. Vorobiev AA Medical and sanitary microbiology. Textbook for university students / AA Vorobiev, YS Krivoshein, VP Shirobokov. - M: Publishing Center "Academy", 2010. - 464 p.
5. Medical microbiology, virology and immunology. Textbook for medical students / ed. A.A.Воробьева. - 2nd ed. - M: LLC "Medical Information Agency", 2008. - 704 p.
6. Jawets. Medical microbiology / Jawets, Melnick, Adelberg. - The McGraw-Hill Companies, Inc., 2011. - 919 p.



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Recommended sources of information

7. В.П. Ширококов. Microbes in biochemical processes, the evolution of the biosphere and the existence of mankind. /V.P. Shirobokov, DS Янковский, Г.С. Смоке. - К: ФОП Верес О.И., 2014. - 464 p.
8. Янковский Д.С. Integral role of symbiotic microflora in human physiology / DS Yankovsky, VP Shirobokov, GS Diment. - К: ТОВ «Червона Рута-Турс», 2011. - 169 p.

Information resources

1. World Health Organization <http://www.who.int/en/>
2. Microbiology and immunology online <http://www.microbiologybook.org/>
3. On-line microbiology note <http://www.microbiologyinfo.com/>
4. Centers for disease control and prevention www.cdc.gov

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Tips for a successful course learning

1. Be active, persistent, inquisitive, consistent
2. Be tidy and polite
2. Systematically prepare for practical classes
3. Attend lectures and lead a synopsis
4. Perform tasks for independent work and protect them in class.
5. Handle the department's equipment carefully, in particular microscopes.