

MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY
Department of Infectious Diseases

«APPROVED»
Vice-rector
for scientific and pedagogical work,
Eduard BURIACHKIVSKYI
« » 2023



WORK PROGRAM IN THE COURSE
“Antibiotic resistance. Rational use of antibiotics”

Level of higher education: the second (Master's)

Field of knowledge: 22 "Health care"

Specialty: 222 "Medicine"

Educational and professional program: Medicine

Odesa 2023

The Work Program (WP) is based on the educational-professional program (EPP) "Medicine" for the second degree (Master's) level of professional training in the specialty 222 Medicine, the field of knowledge 22 Health Care. approved by the Academic Council of ONMedU (Minutes No 8, dated June 29, 2023).

Developer:

Head of the Department, MD, professor Chaban T.V.


The work program was approved at the meeting of the Department of Infectious Diseases
Minutes No. 1 dated " 29 " 08 2023.

Head of the department  Tetjana CHABAN

Agreed with the EPP Guarantor  Valeriia MARICHEREDA

Approved by the subject cycle methodical commission on therapeutic disciplines of ONMedU
Minutes No. 1 dated " 31 " 08 2023.

Chairman of the subject cycle methodical commission for therapeutic disciplines of ONMedU

 Olena VOLOSHYNA

Reviewed and approved at the meeting of the department _____
Minutes No. ___ dated " ___ " _____ 20__

Head of Department _____
(signature) (Name SURNAME)

Reviewed and approved at the meeting of the department _____
Minutes No. ___ dated " ___ " _____ 20__

Head, of Department _____
(signature) (Name SURNAME)

1. The Course Description:

Indicators	Field of knowledge, Specialty, Level of higher education	Features of the academic discipline
Total amount:	22 Health care	<i>Full-time studies</i>
ECTS Credits: 3		<i>Elective course</i>
Hours: 90	222 Medicine	<i>Year of training: 6</i>
Content modules: 3	The second (Master's)	<i>Semesters XI - XII</i>
		<i>Lectures (0 h.)</i>
		<i>Seminars (0 h.)</i>
		<i>Practical sessions (30 h.)</i>
		<i>Labs (0 h.)</i>
		<i>Self-study (60 h.)</i>
		<i>Individual tasks (0 h.)</i>
		<i>Form of final control – Credit test</i>

2. Purpose and objectives of the course, competencies, program learning outcomes.

Purpose. In the general system of training a doctor, the elective course " Antibiotic resistance. Rational use of antibiotics " lays the foundations for acquirers to study family medicine, which involves the integration of teaching with this discipline and the development of skills to apply knowledge in the process of further education and in professional activities.

Formation of skills and abilities:

- the concept of antibiotic resistance.
- the multifaceted nature of the problem of antibiotic resistance in the world
- types of antibiotic resistance.

Improvement of skills:

- reasons for the development of antibiotic resistance in microorganisms. errors in the use of antibiotics.

- mechanisms of formation of microbial resistance
- risk factors for the development of antibiotic-resistant infections
- ways to overcome bacterial resistance to antibiotics.

Mastering skills:

- optimal antibiotic therapy. Making decisions about the use of antibiotics. of antibiotics.

- use of rapid diagnostic tests (procalcitonin, fluorescence in situ using nucleic acid peptides (PNAFISH), matrix-assisted laser desorption ionization (MALDI-TOP)) when deciding whether to prescribe antibiotics.

- peculiarities of using antimicrobial agents in special groups of patients (pregnant women, elderly people, etc.).

- Antimicrobial Stewardship strategy for antimicrobial control

- Order of the Ministry of Health of Ukraine dated May 18, 2022 No. 823 "Rational use of antibacterial and antifungal drugs with therapeutic and prophylactic purposes"

- WHO Global Action Plan to Combat Antimicrobial Resistance

Integral competence (IC):
Ability to solve typical and complex problems, including those of a research and innovation nature in the field of medicine.

General (GC):

GC1 – Ability to abstract thinking, analysis and synthesis.

GC3 – Ability to apply knowledge in practical situations.

GC4 – Knowledge and understanding of the subject area and understanding of professional activity.

GC5 – Ability to adapt and act in a new situation.

GC6 – Ability to take reasonable decisions.

GC7 – Ability to work in a team.

GC8 – Ability to interpersonal interaction.

GC10. Ability to use information and communication technologies.

GC11 – Ability to search, process and analyse information from various sources.

GC12 – Determination and persistence in relation to assigned tasks and assumed responsibilities.

GC14. Ability to realize one's rights and responsibilities as a member of society, to be aware of the values of public (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine.

GC15. Ability to preserve and increase moral, cultural, scientific values and achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle.

GC16. Ability to evaluate and ensure the quality of the work performed.

GC17. Desire to preserve the environment.

Special (SC):

SC1 – Ability to collect the patient's medical information and analyse clinical data.

SC2 – Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results.

SC3 – Ability to establish a preliminary and clinical diagnosis of a disease.

SC4 – Ability to determine the necessary regime of work and rest in the treatment and prevention of diseases.

SC5 – Ability to determine the nature of nutrition in the treatment and prevention of diseases.

SC6 – Ability to determine the principles and nature of treatment and prevention of diseases.

SC7 – Ability to diagnose emergency conditions.

SC8 – Ability to determine tactics and provide emergency medical care.

SC10 – Ability to perform medical manipulations.

SC11 – Ability to solve medical problems in new or unfamiliar environments in the presence of incomplete or limited information, considering aspects of social and ethical responsibility.

SC13 – Ability to carry out sanitary, hygienic and preventive measures.

SC14 – Ability to plan and carry out preventive and anti-epidemic measures for infectious diseases.

SC15 – Ability to conduct an examination of working capacity.

SC16 – Ability to fill medical documentation, including electronic forms.

SC17 – Ability to assess the impact of the environment, socio-economic and biological determinants on the state of health of an individual, family, population.

SC20 – Ability to conduct epidemiological and medical statistical studies of the health of the population; processing of social, economic and medical information.

SC23 – Ability to develop and implement scientific and applied projects in the field of health care.

SC24 – Adherence to ethical principles when working with patients and laboratory animals.

SC25 – Adherence to professional and academic integrity, being responsible for the reliability of the obtained scientific results.

SC26 – Ability to determine the management tactics of persons subject to dispensary supervision.

Program learning outcomes (PLO):

PLO1 – Having a thorough knowledge of the structure of professional activity. Being able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy.

PLO2 - Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.

PLO3 - Specialized conceptual knowledge that includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of problems in the field of medicine and related interdisciplinary problems.

PLO4 - Identifying leading clinical symptoms and syndromes (according to the list 1); according to standard methods, using preliminary data of the patient's history, data of the patient's examination, knowledge about the person, his organs and systems, establish a preliminary clinical diagnosis of the disease (according to the list 2).

PLO5 - Collecting complaints, history of life and diseases, assessing the psychomotor and physical

development of the patient, the state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluation of the information regarding the diagnosis (according to the list 4), considering the age of a patient.

PLO6 - Establishing the final clinical diagnosis by making a reasoned decision and analysing the received subjective and objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms, under the control of the managing physician in the conditions of the health care institution (according to the list 2).

PLO7 - Assigning and analysing additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) (according to the list 4) of patients with diseases of organs and body systems for differential diagnosis of diseases (according to the list 2).

PLO8 - Determination of the main clinical syndrome or symptom that determines the severity of the victim's/victim's condition (according to the list 3) by making a reasoned decision about the person's condition under any circumstances (in the conditions of a health care facility, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.

PLO9 - Determination of the nature and principles of treatment (conservative, operative) of patients with diseases (according to the list 2), taking into account the patient's age, in the conditions of a health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, based on a preliminary clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes, in case of the need to expand the standard scheme, be able to justify personalized recommendations under the control of the head physician in the conditions of a medical institution.

PLO10 - Determination of the necessary mode of work, rest and nutrition based on the final clinical diagnosis, observing the relevant ethical and legal norms, by taking a reasoned decision according to existing algorithms and standard schemes.

PLO14 - Determination of tactics and providing emergency medical care in emergencies (according to the list 3) in limited time conditions according to existing clinical protocols and standards of treatment.

PLO16. Formation of rational medical routes for patients; organization of interaction with colleagues in their own and other institutions, organizations and institutions; applying tools for promoting medical services in the market, based on the analysis of the population needs, in the conditions of the functioning of the health care institution, its division, in a competitive environment.

PLO17. Performing medical manipulations (according to the list 5) in the conditions of a medical institution, at home or work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.

PLO18. Determination of the state of functioning and limitations of a person's vital activities and the duration of incapacity for work with the preparation of relevant documents, in the conditions of a health care institution, based on data about the disease and its course, peculiarities of a person's professional activity, etc. Management of medical documentation regarding the patient and the contingent of the population based on regulatory documents.

PLO19. Planning and implementing a system of anti-epidemic and preventive measures regarding the occurrence and spread of diseases among the population.

PLO20. Analysing the epidemiological situation and carrying out measures for mass and individual, general and local prevention of infectious diseases.

PLO21. Searching for the necessary information in the professional literature and databases of other sources, analysing, evaluating and applying the obtained information.

PLO24. Organization of the necessary level of individual safety (own and the persons taken care of) in case of typical dangerous situations in the individual field of activity.

PLO29. Planning, organising and carrying out measures for the specific prevention of infectious diseases, including by the National calendar of preventive vaccinations, both mandatory and recommended. Managing vaccine residues, and organization of additional vaccination campaigns, including immune-prophylaxis measures.

PLO30. Determination of the management tactics of persons subject to dispensary supervision (children, pregnant women, workers whose professions require mandatory dispensary examination).

PLO31. Determination of the management tactics of persons suffering from chronic infectious diseases subject to dispensary supervision.

As a result of the course study, a acquirer of higher education must:

Know: etiology, epidemiology, pathogenesis, clinic, diagnostics, differential diagnosis, treatment, prevention of infectious diseases and rational use of antibiotics.

Be able to:

- - prescribe optimal antibiotic therapy
- - make decisions on the use of antibiotics.
- - use rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH), matrix-assisted laser desorption ionization (MALDI-TOP)) when deciding whether to prescribe antibiotics.
- - use of antimicrobials in special groups of patients (pregnant women, elderly people, etc.).

3. CONTENTS OF THE COURSE

Content module 1.

General issues of antibiotic resistance

36 hours/1.2 credits: lectures - 0, seminars - 0, practical classes - 12, SRS - 24)

Topic 1: The concept of antibiotic resistance. The multifaceted nature of the problem of antibiotic resistance in the world. Definition of the concept. Relevance of studying the problem

Topic 2. Types of antibiotic resistance. The variety of antibiotic resistance.

Topic 3. Reasons for the development of antibiotic resistance in microorganisms.

Resistance of microorganisms to antibiotics. Etiology. Pathogenesis of formation.

Topic 4. Errors in the use of antibiotics.

The main basis for the development of antibiotic resistance. The role of the doctor in the development of antibiotic resistance.

Topic 5. Mechanisms of microbial resistance formation

The main mechanisms for the development of antibiotic resistance

Topic 6. Risk factors for the development of antibiotic-resistant infections.

Infectious and non-infectious diseases that are at risk of developing antibiotic resistance. Factors that lead to the development of antibiotic resistance.

Content module 2

Possibilities of overcoming antibiotic resistance and diagnostics of rational antibiotic therapy

(30 hours/1.0 credit: lectures - 0, seminars - 0, practical classes - 10, SRS - 20)

Topic 7. Optimal antibiotic therapy. Ways of optimal use of antibiotics.

Topic 8. Decision-making on the use of antibiotics. The role of the family doctor in the rational prescription of antibiotics.

Topic 9: The use of rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH) in deciding whether to prescribe antibiotics. Features of the diagnostic search for overcoming antibiotic resistance.

Topic 10. The use of matrix-assisted laser desorption ionisation (MALDI-TOP) in deciding whether to prescribe antibiotics. Features of the diagnostic search for overcoming antibiotic resistance

Topic 11: Peculiarities of using antimicrobial agents in special groups of patients (pregnant women, elderly people, etc.). Special groups of patients, expediency of antibiotics use, factors to be taken into account when prescribing antibiotics to pregnant women, elderly people, newborns and patients of other special groups

Content module 3

Legislative framework and international experience in overcoming antibiotic resistance

(24 hours / 0.8 credits: lectures - 0, seminars - 0, practical classes - 8, SRS - 16)

Topic 12: Antimicrobial Stewardship strategy. Definition of antimicrobial control, its strategy.

Topic 13 Order of the Ministry of Health of Ukraine of 18 May 2022 No. 823 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Responsibility for rational prescription of antibiotics.

Topic 14 Order of the Ministry of Health of Ukraine dated 18 May 2022 No. 823 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Peculiarities of

antimicrobial control in Ukraine

Topic 15: WHO Global Action Plan to Combat Antimicrobial Resistance. The main provisions of the WHO to combat antibiotic resistance. Participation of Ukraine in the global plan to overcome antibiotic resistance.

4. Structure of the credit

Topic	Hours					
	Total	including				
		Lectures	Seminars	Practical sessions	Labs	Self-study
Content module 1						
Epidemiological and clinical features of HIV infection						
Topic 1: The concept of antibiotic resistance. The multifaceted nature of the problem of antibiotic resistance in the world				2		4
Topic 2. Types of antibiotic resistance.				2		4
Topic 3. Reasons for the development of antibiotic resistance in microorganisms. Errors in the use of antibiotics				2		4
Topic 4. Mechanisms of formation of microbial resistance				2		4
Topic 5. Risk factors for the development of antibiotic-resistant infections				2		4
Topic 6: Ways to overcome bacterial resistance to antibiotics				6		4
Total by content module 1	36			12		24
Content module 2						
Features of laboratory diagnosis of HIV infection						
Topic 7. Optimal antibiotic therapy				2		4
Topic 8: Decision-making on the use of antibiotics				2		4
Topic 9: The use of rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH)) in deciding whether to prescribe antibiotics				2		4
Topic 10. The use of matrix-assisted laser desorption ionisation (MALDI-TOP) in deciding whether to prescribe antibiotics				2		4
Topic 11: Peculiarities of using antimicrobial agents in special groups of patients (pregnant women, elderly people, etc.).				2		4
Total by content module 2	30			10		20
Content module 3						
Features of HIV counseling and ART therapy						
Topic 12: Antimicrobial management strategy.				2		4
Topic 13. Order of the Ministry of Health of Ukraine				2		4

No. 823 of 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Responsibility for rational prescription of antibiotics.						
Topic 14: Order of the Ministry of Health of Ukraine No. 823 dated 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Peculiarities of antimicrobial control in Ukraine.				2		4
Topic 15: WHO Global Action Plan to Combat Antimicrobial Resistance				2		4
Total by content module 3	24			8		16
РАЗОМ	90	0	0	30	0	60

Audit work - 33%, independent work - 66%.

5. Topics of lectures / seminars / practicals / labs

5.1. Topics of lectures

Lectures are not provided

5.2. Topics of seminars

Seminar sessions are not provided

5.3. Topics of practical sessions

No	Topic	Hours
Content module 1		
Epidemiological and clinical features of HIV infection		
1	Topic 1: The concept of antibiotic resistance. The multifaceted nature of the problem of antibiotic resistance in the world	2
2	Topic 2. Types of antibiotic resistance.	2
3	Topic 3. Reasons for the development of antibiotic resistance in microorganisms. Errors in the use of antibiotics	2
4	Topic 4. Mechanisms of formation of microbial resistance	2
5	Topic 5. Risk factors for the development of antibiotic-resistant infections	2
6	Topic 6: Ways to overcome bacterial resistance to antibiotics	2
Content module 2		
Features of laboratory diagnosis of HIV infection		

7	Topic 7. Optimal antibiotic therapy	2
8	Topic 8: Decision-making on the use of antibiotics	2
9	Topic 9: The use of rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH)) in deciding whether to prescribe antibiotics	2
10	Topic 10. The use of matrix-assisted laser desorption ionisation (MALDI-TOP) in deciding whether to prescribe antibiotics	2
11	Topic 11: Peculiarities of using antimicrobial agents in special groups of patients (pregnant women, elderly people, etc.).	2
Content module 3 Features of HIV counseling and ART therapy		
12	Topic 12: Antimicrobial management strategy.	
13	Topic 13. Order of the Ministry of Health of Ukraine No. 823 of 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Responsibility for rational prescription of antibiotics.	
14	Topic 14: Order of the Ministry of Health of Ukraine No. 823 dated 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Peculiarities of antimicrobial control in Ukraine.	2
15	Topic 15: WHO Global Action Plan to Combat Antimicrobial Resistance	2
TOTAL		30

5.4. Topics of laboratory sessions

Laboratory sessions are not provided

6. Acquirers' self-study activities

No	Topic	Hours
Content module 1		
Epidemiological and clinical features of HIV infection		
1	Topic 1. Preparation to the practical session No 1 on the topic "The concept of antibiotic resistance. The multifaceted nature of the problem of antibiotic resistance in the world"	2
2	Topic 2. Preparation to the practical session No 2 on the topic "Types of antibiotic resistance"	2
3	Topic 3. Preparation to the practical session No 3 on the topic "Reasons for the development of antibiotic resistance in microorganisms. Errors in the use of antibiotics"	2
4	Topic 4. Preparation to the practical session No 4 on the topic «Mechanisms of formation of microbial resistance»	2
5	Topic 5. Preparation to the practical session No 5 on the topic "Risk factors for the development of antibiotic-resistant infections"	2
6	Topic 6. Preparation to the practical session No 6 on the topic "Ways to overcome bacterial resistance to antibiotics"	2
Content module 2		
Features of laboratory diagnosis of HIV infection		
7	Topic 7. Preparation to the practical session No 7 on the topic "Optimal antibiotic therapy"	2
8	Topic 8. Preparation to the practical session No 8 on the topic "Decision-making on the use of antibiotics"	2
9	Topic 9. Preparation to the practical session No 9 on the topic "The use of rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH)) in deciding whether to prescribe antibiotics"	2
10	Topic 10. Preparation to the practical session No 10 on the topic "The use of matrix-assisted laser desorption ionisation (MALDI-TOP) in deciding whether to prescribe antibiotics"	2
11	Topic 11. Preparation to the practical session No 12 on the topic "Peculiarities of using antimicrobial agents in special groups of patients (pregnant women, elderly people, etc.)"	2
Content module 3		
Features of HIV counseling and ART therapy		
12	Topic 12. Preparation to the practical session No 12 on the topic "Antimicrobial management strategy"	2
13	Topic 13. Preparation to the practical session No 13 on the topic "Order of the Ministry of Health of Ukraine No. 823 of 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Responsibility for rational prescription of antibiotics"	2
14	Topic 14. Preparation to the practical session No 14 on the topic "Order of the Ministry of Health of Ukraine No. 823 dated 18 May 2022 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes". Peculiarities of antimicrobial control in Ukraine"	2
15	Topic 15. Preparation to the practical session No 15 on the topic "WHO Global Action Plan to Combat Antimicrobial Resistance"	2
TOTAL		60

7. Teaching techniques

Practical classes: conversation, role-playing, solving clinical situational problems, practicing the skills of examining a patient, practicing the skills of performing manipulations according to list 5, skills of differential diagnosis of the most common diseases.

Independent work: independent work with recommended basic and additional literature, with electronic information resources, preparation for practical classes; independent work with a bank of test tasks Step-2, independent mastering of communication algorithms with the patient.

8. Forms of control and evaluation methods (including criteria for evaluating learning outcomes)

Current monitoring of the success of acquirers' learning is carried out during practical training on the basis of theoretical knowledge and practical skills and abilities, for which the following forms of control are used

- oral survey;
- blitz survey;
- control of practical skills (work at the patient's bedside) - control by the teacher, self-control;
- control of solving a situational clinical problem with a diagnosis, its justification and answers to questions at the end of the class (written control);
- oral/written answers to questions on SRS topics in accordance with the calendar and thematic plan;
- assessment of activity in the classroom.

The grade for one practical lesson is the arithmetic mean of all components and can only have an integer value (5, 4, 3, 2), which is rounded according to the statistical method.

Final control: credit.

Evaluation of current learning activities in a practical / seminar / laboratory class:

1. Assessment of theoretical knowledge on the topic of the lesson:
 - methods: a) survey, b) oral/written answers, c) solving a situational clinical problem;
 - maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.
2. Assessment of work with a patient and practical skills on the topic of the class.
 - Methods: a) assessment of communication skills with the patient, b) correctness of appointment and evaluation of laboratory and instrumental studies, c) compliance with the algorithm of differential diagnosis, d) justification of the clinical diagnosis, e) preparation of a treatment plan.
 - maximum mark - 5, minimum mark - 3, unsatisfactory mark - 2.

Current evaluation criteria in practical training

Grade	Evaluation criteria
Excellent «5»	The acquirer has a fluent command of the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates practical skills during the examination of a patient and the interpretation of clinical, laboratory and instrumental research data, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
Good «4»	The acquirer has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the

	examination of a patient and the interpretation of clinical, laboratory and instrumental research data with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactory «3»	The acquirer does not have sufficient knowledge of the material, is unsure of participating in the discussion and solving of the situational clinical problem, demonstrates practical skills during the examination of the patient and the interpretation of clinical, laboratory and instrumental research data with significant errors.
Unsatisfactory «2»	The acquirer does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of the patient and the interpretation of clinical, laboratory and instrumental research data.

Credit is awarded to an applicant who has completed all the tasks of the work program of the discipline, actively participated in practical classes, completed and defended an individual assignment and has a current average grade of at least 3.0 and has no academic debt.

The test is taken: at the last lesson before the start of the examination session - in the case of the tape system of education, at the last lesson - in the case of the cycle system of education. The grade for the test is the arithmetic average of all components on a traditional four-point scale and has a value that is rounded according to the statistical method with two decimal places.

9. Distribution of points received by acquirers of higher education

The obtained grade point average for the discipline for acquirers who have successfully completed the work program of the discipline is converted from the traditional four-point scale to points on a 200-point scale, as shown in the table:

Table of conversion of traditional grade into a multi-point scale

National assessment for discipline	The sum of points for the discipline
Excellent («5»)	185-200
Good («4»)	151-184
Satisfactory («3»)	120-150
Unsatisfactory («2»)	Lower then 120

A multi-point scale (200-point scale) characterizes the actual performance of each acquirer in mastering the educational component. The conversion of the traditional grade (grade point average for a discipline) into a 200-point scale is performed by the University's Information Technology Department.

According to the points obtained on a 200-point scale, the achievements of applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows to evaluate the achievements of applicants in the educational component who study in one course of one specialty, according to the points they received.

The ECTS scale is a relative and comparative rating scale that establishes the applicant's belonging to the group of the best or worst among the reference group of fellow acquirers (faculty, specialty). Grade A on the ECTS scale cannot be equal to grade A, and grade B cannot be equal to grade B, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" on the ECTS scale do not coincide with the limits of grades "5", "4", "3" on the traditional scale. Applicants who have received grades "FX" and "F" ("2") are not included in the list of ranked applicants. The grade "FX" is assigned to applicants

who have scored the minimum number of points for current academic activities, but who have not been credited with the final control. The grade "F" is assigned to applicants who have attended all classes in the discipline, but have not gained an average score (3.00) for current academic activities and are not allowed to take the final control.

Acquirers enrolled in the same course (one specialty), based on the number of points gained in the discipline, are ranked on the ECTS scale as follows:

**Conversion of the traditional grade from the discipline and
the sum of points on the ECTS scale**

ECTS mark	Statistic index
"A"	Next 10% of acquirers
"B"	Next 25% of acquirers
"C"	Next 30% of acquirers
"D"	Next 25% of acquirers
"E"	Next 10% of acquirers

10. Methodological back-up

- The course's work program;
- The syllabus;
- Methodical manuals to practical sessions;
- Guidelines to acquirers' self-studies;
- Multimedia presentations;
- Case study assignments;
- Cases of laboratory studies results
- Role-play scenarios

11. Topics for preparation to final control

1. The concept of antibiotic resistance.
2. The multifaceted nature of the problem of antibiotic resistance in the world
3. Types of antibiotic resistance.
4. Reasons for the development of microbial resistance to antibiotics.
5. Errors in the use of antibiotics.
6. Mechanisms of formation of microbial resistance.
7. Risk factors for the development of antibiotic-resistant infections
8. Ways to overcome bacterial resistance to antibiotics.
9. Optimal antibiotic therapy.
10. Decision-making about the use of antibiotics.
of antibiotics.
11. The use of rapid diagnostic tests (procalcitonin, fluorescence in situ with nucleic acid peptides (PNAFISH), matrix-assisted laser desorption ionisation (MALDI-TOP)) in deciding whether to prescribe antibiotics.
12. Features of the use of antimicrobial agents in special groups of patients
of patients (pregnant women, elderly people, etc.).
13. Antimicrobial Stewardship strategy.
14. Order of the Ministry of Health of Ukraine of 18 May 2022 No. 823 "Rational use of antibacterial and antifungal drugs for therapeutic and prophylactic purposes"
15. "WHO Global Action Plan to Combat Antimicrobial Resistance

12. Recommended literature

Basic:

1. Infectious Diseases: textbook (IV a. 1.) / O.A. Holubovska, M.A. Andreichyn, A.V. Shkurba, T.V. Chaban et al. К. ВСВ «Медицина», 2018. (APPROVED by the Ministry of Education and Science of Ukraine as a textbook for students of higher medical educational establishments; APPROVED by the Ministry of Health of Ukraine as a textbook for students of higher medical educational establishments) – 664 с. + 12 с. кольор. вкл. ; двокольор. вид. ISBN 978-617-505-727-8.
2. Інфекційні хвороби: Підручник / Є.В. Нікітін, М.А. Андрейчин, К.Л. Сервецький, В.О. Качор, А.М. Головченко, Є.М. Усиченко: За ред. Є.В. Нікітіна та М.А. Андрейчина. – Тернопіль: Укрмедкнига, 2004. – 364 с. ISBN 966-673-012-X
3. Pediatric Infectious Diseases: textbook / S.O. Kramarov, O.B. Nadraga, L.V. Pyra et al.; edited by S.O. Kramarov, O.B. Nadraga. — 4th edition. — Kyiv: AUS Medicine Publishing, 2020. — 240 p.
4. General epidemiology: study guide (IV a. 1.) / N.O. Vynograd. — 3rd edition, corrected K: ВСВ «Медицина», 2017. – 128 с.
5. Hagberg H., Wennerholm U.B., Savman K. // Current Opinion in Infection Disease». – 2015. - Vol. - № 3. - P. 301-306.
6. Harrison's Principles of internal medicine. 19th edition /edited by Anthony S. Fauci, Dennis L Kasper, Dan L. Longo [et all]. – New York. - 2017. – 1307 p.

Additional

1. Comprehensive Textbook of Infectious Disease: M. I. Sahadulla, S. A. Udman. – 2nd edition. Jaypee Brothers, Medical Publishers Pvt. Limited, 2019 – 835 p.
2. Атлас дитячих інфекційних хвороб. Червона Книга = Red Book® Atlas of Pediatric Infectious Diseases: пер. 3-го англ. вид. : двомов. вид. / Керол Дж. Бейкер ; наук. ред. пер. проф. С.О. Крамарьов; пер. з англ. Л.В. Загордонєць. — К. : ВСВ «Медицина», 2019. — 744 с. Tropical infections: manual/ed. MA Andreychyn, VD Moskaliuk. - Lviv: "Magnolia 2006", 2019. - 220 p.
3. Tropical infections: manual/ed. MA Andreychyn, VD Moskaliuk. - Lviv: "Magnolia 2006", 2019. - 220 p.

13. Online sources

- <https://library.odmu.edu.ua/catalog/> - Electronic catalogue of the ONMedU library
- <http://moz.gov.ua> – Ministry of Health of Ukraine
- www.ama-assn.org –American Medical Association
- www.who.int – World Health Organisation
- www.dec.gov.ua/mtd/home/ - The State Expert Center of the Ministry of Health of Ukraine
- <http://bma.org.uk> – British Medical Association
- www.gmc-uk.org - General Medical Council (GMC)
- www.bundesaerztekammer.de – German Medical Association