

MINISTRY OF HEALTH PROTECTION OF UKRAINE

ODESSA NATIONAL MEDICAL UNIVERSITY

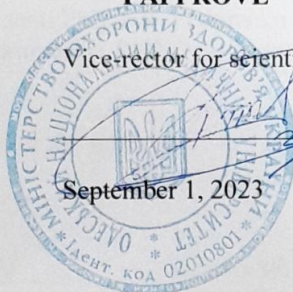
Department of general and clinical epidemiology and biosafety

I APPROVE

Vice-rector for scientific and pedagogical work

Eduard BURIACHKIVSKYI

September 1, 2023



**WORKING PROGRAM OF EDUCATIONAL DISCIPLINE
"BASICS OF IMMUNOPROPHYLAXIS"**

Level of higher education:second (master's)

Branch of knowledge:22 "Health care"

Specialty:222 "Medicine"

Educational and professional program: Medicine

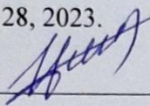
2023

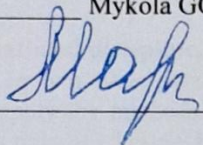
The work program is compiled on the basis of the educational and professional program "Medicine" for the training of specialists of the second (master's) level of higher education in the specialty 222 "Medicine" of the field of knowledge 22 "Health care", approved by the Scientific Council of ONMedU (protocol No. 8 of June 29, 2023).

Developers:

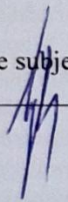
head of the department, Prof., Doctor of Medicine, M.I. Golubyatnykov
professors of the department, Doctor of Medicine, O.V. Bachynska,
associate professor of the department: PhD T.V. Fedorenko
assistants to prof.: PhD T.V. Gerasimenko, PhD O.A. Melnyk, K.S. Hrytsenko

The work program was approved at the meeting of the department of general and clinical epidemiology and biosafety
Protocol No. 1 dated August 28, 2023.

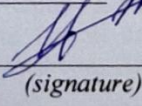
Head of the department  Mykola GOLUBYATNYKOV

Agreed with the guarantor of the OPP  Valery MARICHEREDA

Approved by the subject cycle commission for medical and biological disciplines of ONMedU
Protocol No. ___ of "___" _____ 2023.

Head of the subject cycle methodical commission for medical and biological disciplines of ONMedU
 Leonid GODLEVSKYI

Reviewed and approved at the meeting of the department
of general and clinical epidemiology and biosafety with course of microbiology and virology
Protocol No. 1 of "1" September, 2023

Head of the department  Mykola GOLUBYATNYKOV
(signature) (First Name Surname)

Reviewed and approved at the meeting of the department

Protocol No. ___ of "___" _____ 20__

Head of Department _____
(signature) (First Name Surname)

1. Description of the academic discipline:

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline	
The total number of: Credits - 3 Hours - 90 Content subdivisions - 1	Branch of knowledge 22 "Health care"	<i>Full-time education</i>	
		<i>Elective discipline</i>	
	Specialty 222 "Medicine"	<i>A year of training</i>	3
		<i>Semester</i>	V-VI
	Level of higher education second (master's)	<i>Lectures</i>	0
		<i>Practical</i>	30 hours
		<i>Independent work</i>	60 hours
		<i>Including individual tasks</i>	0
	<i>Final control form</i>	Test	

2. The purpose and tasks of the educational discipline, competences, program learning outcomes.

Goal: the formation of future specialists in their socio-personal and professional competence, the basis of which is the knowledge and ability to apply the methods of immunoprophylaxis of infectious diseases, which are relevant for the population not only of Ukraine, but also of the world.

Task:

- creating a holistic view of the immune system and forming an immune response
- familiarization with the calendar of preventive vaccinations
- mastering ways to form and analyze an individual calendar of vaccinations for children of different ages
- assimilation of the issue of choosing immunobiological drugs depending on the child's age and state of health
- mastering the peculiarities of vaccination of children with and without contraindications
- familiarization with methods of immunotherapy and immunorehabilitation
- mastering issues of differential diagnosis of post-vaccination reactions and complications;
- mastering the moral and deontological principles of a medical specialist and the principles of professional subordination during immunization;
- mastering the ability to immunize the population in accordance with current legislation.

The process of studying the discipline is aimed at forming elements of the following competencies:

IR. The ability to solve typical and complex problems, including those of a research and innovation nature in the field of medicine. Ability to continue learning with a high degree of autonomy.

- 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 make informed 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 analyze information from various sources
- GC16. The ability to evaluate and ensure the quality of the work performed

Special (SK):

- SC1. Ability to collect medical information about the patient and analyze 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 the disease

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

SC16. Ability to maintain medical documentation, including electronic forms

Program learning outcomes (PLO):

PLO1. Have thorough knowledge of the structure of professional activity. To be 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 fundamental and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.

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

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

PLO29. Plan, organize and carry out measures for the specific prevention of infectious diseases, including in accordance with the National calendar of preventive vaccinations, both mandatory and recommended. Manage vaccine residues, organize additional vaccination campaigns, including immunoprophylaxis measures

As a result of studying the academic discipline, the student of higher education must:

Know:

- peculiarities of functioning of the central and peripheral organs of the immune system;
- concept of vaccines;
- classification of vaccines;
- ways of introduction;
- procedure for storage and transportation;
- order of vaccinations by age;
- peculiarities of vaccination of children with a violation of the vaccination calendar;
- peculiarities of vaccination of children according to epidemic indications;
- the concept of the post-vaccination period;
- the concept of an adverse event after immunization;
- classification of post-vaccination reactions;
- classification of post-vaccination complications;
- peculiarities of diagnosis of PVU and PVR;
- criteria for differential diagnosis of PVA and PVR;-
- terms of development of possible adverse events after immunization (reactions and complications);
- prospectsdevelopment of vaccines and vaccine prophylaxis;
- the concept of urgent prevention;
- drugs for urgent immunoprophylaxis;
- types of immune serums and features of their use;
- principles of immunotherapy;
- principles of immunorehabilitation.

Be able:

- to establish psychological contact with the parents of children to be vaccinated
- to determine the doctor's responsibility for the correct and timely administration of vaccinations
- distinguish changes in the immune response in the event of violations of various links of immunity
- plan the volume of preventive vaccinations per year
- evaluate the clinical, immunological, epidemiological effectiveness of specific immunoprophylaxis;
- draw up a vaccination plan for children with a broken calendar
- determine the doctor's responsibility for the correct tactics in preparing children from "risk groups" for preventive vaccinations

- determine indications for vaccination according to epidemic indications;
- be able to prescribe antiviral and therapeutic vaccines
- carry out diagnostics, prevention, monitoring of PVA and PVR
- carry out an assessment of suitability for use of medical and biological drugs;
- determine the doctor's responsibility for the correct and timely implementation of urgent rabies prevention. and tetanus
- determine the doctor's responsibility for the correct and timely administration of anti-diphtheria and anti-botulinum serum.
- determine the doctor's responsibility for correct and timely immunocorrection and immunorehabilitation

Master the skills:

- organize preventive vaccinations in accordance with the Vaccination Calendar and current immunization schemes;
- fill in the relevant documentation about a case of PVA or PVR, conduct an operational investigation
- organize and carry out preventive vaccinations and tuberculin diagnostics;
- select immunobiological drugs for certain age categories of children and adults;
- calculate the amount of medical and biological drugs needed for vaccinations;
- organize urgent rabies prevention
- organize urgent prevention of tetanus;
- organize urgent prevention of diphtheria;
- organize urgent prevention of botulism;
- to evaluate the clinical effectiveness of specific immunoprophylaxis;
- to assess the immunological effectiveness of specific immunoprophylaxis;
- to evaluate the epidemiological effectiveness of specific immunoprophylaxis
- assess the state of the immune response.
- adequately choose from the main types of immunomodulators.
- timely diagnose side reactions and complications during immunotherapy.
- choose immunobiological drugs for certain age categories of children and adults
- keep a record of the use of vaccines and toxoids.
- fill out the journal and card of preventive vaccinations;

3. Content of the academic discipline:

Content module I. Basics of immunoprophylaxis.

Topic 1. General concepts: immunity, immune organs, immunocompetent cells, types of immunity (specific, non-specific, species, active, passive, congenital, acquired), cytokines, immunoglobulins. Features of the immune system in different age periods.

Features of the functioning of the central and peripheral organs of the immune system (bone marrow, thymus, lymph nodes, spleen). Factors of innate immunity: cellular (monocytic - macrophage system, killer and granulocyte cells), humoral (complement system, cytokines, etc.). Populations (T- and B-lymphocytes) and subpopulations (T-helpers of type 1 and 2, T-regulatory, T-CTL) of lymphocytes. The concept of innate and acquired immunity. Age-related features of the functioning of immunocompetent cells. The immune system of a newborn and a child at different ages. The connection between the immune system and the aging of the body. The main immunological changes that occur during aging.

Topic 2. Immunoprophylaxis. Concept of vaccine. Classification. Main representatives. Requirements for vaccines. Ways of their introduction. Periods of immune response by antibody titer. Immunological memory..

Immunoprophylaxis, the purpose of immunization. Concept of vaccine. Classification of vaccines. Indications for vaccination (scheduled, according to epid. indications). Periods of immune response by antibody titer. Requirements for vaccines. Ways of introduction. The procedure for ensuring proper conditions of storage, transportation, acceptance and accounting of vaccines, toxoids and tuberculosis

allergen in Ukraine.

Topic 3. Preventive vaccinations in Ukraine. Order of the Ministry of Health of Ukraine dated August 14, 2014 No. 551 "On the improvement of preventive vaccinations in Ukraine" with amendments dated May 18, 2018 Order No. 947 "On amendments to the Calendar of preventive vaccinations in Ukraine". Calendar of preventive vaccinations. Vaccine drugs used. List of medical contraindications to preventive vaccinations.

Terms Order No. 551 of the Ministry of Health of Ukraine dated August 14, 2014 "On improving preventive vaccinations in Ukraine" with amendments dated May 18, 2018 Order No. 947 "On amendments to the Calendar of preventive vaccinations in Ukraine". Definition of terms: vaccination, revaccination, primary vaccine complex. Order of vaccinations by age. Anti-infectious vaccines calendar of preventive vaccinations. List of medical contraindications to preventive vaccinations. The procedure for issuing vaccines and toxoids to citizens through the pharmacy network. Temperature log in the refrigerator. Journal of accounting and use of vaccines and toxoids.

Topic 4. Features of vaccination of children with a violation of the vaccination calendar. Children with a complicated history, perinatal encephalopathy and neurological symptoms, with a complicated allergic history, with unusual reactions to previous vaccination and post-vaccination complications are vaccinated with a delay. Vaccination of special groups: premature, immunodeficient, HIV-infected, pregnant, children with chronic diseases is carried out according to an individual calendar of vaccinations, in terms and seasons most favorable for the body.

Topic 5. Vaccination according to epidemic indications. Vaccines against particularly dangerous infections. Antiviral vaccines. Therapeutic vaccines (brucellosis, gonococcal, staphylococcal toxoid and vaccine (liquid and dry) and others).

Vaccines used for epidemiological indications. Vaccines against particularly dangerous infections. Antiviral vaccines. Therapeutic vaccines. Order of the Ministry of Health of Ukraine dated September 16, 2011 No. 595 "On the procedure for conducting prophylactic vaccinations in Ukraine and quality control and circulation of medical immunobiological preparations." Definition of concepts: Endemic territory, enzootic territory, epidemic indications. Vaccinations that are carried out in endemic and enzootic areas and for epidemic indications. Categories of citizens subject to vaccination.

Topic 6. Post-vaccination reactions. General, local. Clinical forms. Peculiarities of diagnosis of PVU, differential diagnosis criteria. Treatment of post-vaccination pathology and emergency conditions. Prevention of PVP. Monitoring of PVU and PVR. Organization of vaccinations. Experience of vaccine prevention and eradication of smallpox. Eradication of poliomyelitis and other childhood infections.

Post-vaccination reactions. General, local. Clinical forms. Peculiarities of diagnosis of PVU, differential diagnosis criteria. Treatment of post-vaccination pathology and emergency conditions. Prevention of PVP. Monitoring of PVU and PVR. Instructions on the organization of epidemiological surveillance of adverse events after immunization when using vaccines, toxoids and tuberculosis allergen. List of possible adverse events after immunization that require further investigation. Timing of development of possible adverse events after immunization (reactions and complications). Generalized data on the presence of NPU. List of information on the case of an adverse event after immunization (group reactions and complications) when using vaccines, toxoids and tuberculosis allergen. Regulations on prompt response to adverse events after immunization when using vaccines, toxoids and tuberculosis allergen in the event of hospitalization or death. Prompt reporting of adverse events after immunization. The final conclusion of the operational response groups. Regulations on the group of operational response to adverse events after immunization in case of hospitalization or fatality.

Topic 7. Prospects of vaccine prevention for certain infectious diseases.

Prospects for the development of vaccines and vaccine prevention of such infections as: adenovirus infection, ascariasis, HIV infection, hepatitis C, hemorrhagic fevers, klebsiella, Lyme, legionellosis, listeriosis, malaria, parainfluenza, respiratory syncytial infection, syphilis, streptococcal infection, toxoplasmosis, chlamydia, cytomegalovirus infection, shigellosis.

Topic 8. Serotherapy and seroprophylaxis. Features of the use of immune serums and immunoglobulins in the prevention of tetanus, rabies, botulism, diphtheria.

The concept of urgent prevention. Drugs for urgent immunoprophylaxis. Types of immune serums, classification according to the method of obtaining, directionality of action, features of their use; immunoglobulins and gammaglobulins, their advantage over immune sera, the duration of immunity created by them. Methods of introduction. Characteristics of drugs for urgent prevention of tetanus, rabies, diphtheria, botulism (release form, method of administration, dose, reaction to administration). Immunoglobulins and their use in the treatment of other infections.

Topic 9. Immunotherapy.

Principles of immunotherapy. Specific and non-specific immunotherapy. Immunotropic drugs. Characteristics of immunomodulators. Drugs obtained from cells and organs of the immune system. Classification of interferons. The main criteria for prescribing immunomodulatory drugs. Immunotropic drugs approved for medical use in Ukraine and Russia. Rules for prescribing immunotropic drugs. Diseases and complications caused by immunotherapy and immunoprophylaxis.

Topic 10 .Immunorehabilitation. Vaccination for the purpose of immunorehabilitation.

Principles of immunorehabilitation. Types of immunorehabilitation: specialized immunorehabilitation, applied immunorehabilitation, individual immunorehabilitation, population immunorehabilitation, ecological immunorehabilitation.

4. Structure of the academic discipline:

No	Topic name	Number of hours		
		total	software	ISW
1	General concepts: immunity, immune organs, immunocompetent cells, types of immunity (specific, non-specific, species, active, passive, congenital, acquired), cytokines, immunoglobulins. Features of the immune system in different age periods.	8	2	6
2	Immunoprophylaxis. Concept of vaccine. Classification. Main representatives. Requirements for vaccines. Ways of their introduction. Periods of immune response by antibody titer. Immunological memory.	10	4	6
3	Preventive vaccinations in Ukraine. Order of the Ministry of Health of Ukraine dated 14.08.2014 No. 551 "On improvement of preventive vaccinations in Ukraine" as amended from 18.05.2018 Order No. 947 "On amendments to the Calendar of preventive vaccinations in Ukraine" Calendar of preventive vaccinations. Vaccine drugs used. List of medical contraindications to preventive vaccinations.	10	4	6
4	Features of vaccination of children with a violation of the vaccination calendar (with a burdened history, perinatal encephalopathy and neurological symptoms, with a burdened allergic history, with unusual reactions to previous vaccinations and post-vaccination complications). Vaccination of special groups: premature, immunocompromised, HIV-infected, pregnant, children with chronic diseases.	10	4	6
5	Vaccination according to epidemic indications. Vaccines against particularly dangerous infections. Antiviral vaccines. Therapeutic vaccines (brucellosis, gonococcal, staphylococcal toxoid and vaccine (liquid and dry) and others).	8	2	6
6	Post-vaccination reactions. General, local. Clinical forms. Peculiarities of diagnosis of PVC, differential diagnosis criteria. Treatment of post-vaccination pathology and emergency conditions. Prevention of PVP. Monitoring of PVC and PVR. Organization of vaccinations. Experience of vaccine prevention and eradication of smallpox. Eradication of poliomyelitis and other childhood infections.	10	4	6
7	Prospects of vaccine prevention for certain infectious diseases.	8	2	6
8	Serotherapy and seroprophylaxis. Features of the use of immune serums and immunoglobulins in the prevention of tetanus, rabies, botulism,	10	4	6

	diphtheria.			
9	Immunotherapy.	8	2	6
10	Immunorehabilitation. Vaccination for the purpose of immunorehabilitation.	10	2	6
Total hours		90	30	60

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

Lectures are not provided.

5.2. Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

No	Topic	Number hours
1.	General concepts: immunity, immune organs, immunocompetent cells, types of immunity (specific, non-specific, species, active, passive, congenital, acquired), cytokines, immunoglobulins. Features of the immune system in different age periods.	2
2.	Immunoprophylaxis. Concept of vaccine. Classification. Main representatives. Requirements for vaccines. Ways of their introduction. Periods of immune response by antibody titer. Immunological memory.	4
3.	Preventive vaccinations in Ukraine. Order of the Ministry of Health of Ukraine dated August 14, 2014 No. 551 "On the improvement of preventive vaccinations in Ukraine" with amendments dated May 18, 2018 Order No. 947 "On amendments to the Calendar of preventive vaccinations in Ukraine". Calendar of preventive vaccinations. Vaccine drugs used. List of medical contraindications to preventive vaccinations."	4
4.	Features of vaccination of children with a violation of the vaccination calendar (with a burdened history, perinatal encephalopathy and neurological symptoms, with a burdened allergic history, with unusual reactions to previous vaccinations and post-vaccination complications). Vaccination of special groups: premature, immunocompromised, HIV-infected, pregnant, children with chronic diseases.	4
5.	Vaccination according to epidemic indications. Vaccines against particularly dangerous infections. Antiviral vaccines. Therapeutic vaccines (brucellosis, gonococcal, staphylococcal toxoid and vaccine (liquid and dry) and others).	2
6.	Post-vaccination reactions. General, local. Clinical forms. Peculiarities of diagnosis of PVC, criteria of differential diagnosis. Treatment of post-vaccination pathology and emergency conditions. Prevention of PVP. Monitoring of PVC and PVR. Organization of vaccinations. Experience of vaccine prevention and eradication of smallpox. Eradication of poliomyelitis and other childhood infections.	4
7.	Prospects of vaccine prevention for certain infectious diseases	2

8.	Serotherapy and seroprophylaxis. Features of the use of immune serums and immunoglobulins in the prevention of tetanus, rabies, botulism, diphtheria.	4
9.	Immunotherapy.	2
10.	Immunorehabilitation. Vaccination for the purpose of immunorehabilitation.	2
total		30

5.4. Topics of laboratory classes

Laboratory classes are not provided.

6. Independent work of a student of higher education

No	TOPIC	Number hours
1.	General concepts: immunity, immune organs, immunocompetent cells, types of immunity (specific, non-specific, species, active, passive, congenital, acquired), cytokines, immunoglobulins. Features of the immune system in different age periods.	6
2.	Immunoprophylaxis. Concept of vaccine. Classification. Main representatives. Requirements for vaccines. Ways of their introduction. Periods of immune response by antibody titer. Immunological memory.	6
3.	Preventive vaccinations in Ukraine. Order of the Ministry of Health of Ukraine dated August 14, 2014 No. 551 "On the improvement of preventive vaccinations in Ukraine" with amendments dated May 18, 2018 Order No. 947 "On amendments to the Calendar of preventive vaccinations in Ukraine". Calendar of preventive vaccinations. Vaccine drugs used. List of medical contraindications to preventive vaccinations."	6
4.	Features of vaccination of children with a violation of the vaccination calendar (with a burdened history, perinatal encephalopathy and neurological symptoms, with a burdened allergic history, with unusual reactions to previous vaccinations and post-vaccination complications). Vaccination of special groups: premature, immunocompromised, HIV-infected, pregnant, children with chronic diseases.	6
5.	Vaccination according to epidemic indications. Vaccines against particularly dangerous infections. Antiviral vaccines. Therapeutic vaccines (brucellosis, gonococcal, staphylococcal toxoid and vaccine (liquid and dry) and others).	6
6.	Post-vaccination reactions. General, local. Clinical forms. Peculiarities of diagnosis of PVU, criteria of differential diagnosis. Treatment of post-vaccination pathology and emergency conditions. Prevention of PVP. Monitoring of PVU and PVR. Organization of vaccinations. Experience of vaccine prevention and eradication of smallpox. Eradication of poliomyelitis and other childhood infections.	6
7.	Prospects of vaccine prevention for certain infectious diseases	6
8.	Serotherapy and seroprophylaxis. Features of the use of immune serums and immunoglobulins in the prevention of tetanus, rabies, botulism, diphtheria.	6
9.	Immunotherapy.	6

10.	Immunorehabilitation. Vaccination for the purpose of immunorehabilitation.	6
	total	60

7. Teaching methods

Practical training: conversation, solving situational problems, practicing skills for working with medical documentation.

Independent work: independent work with the textbook, independent work with the bank of test tasks Step-2, independent solution of situational tasks.

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

Current control: oral survey, testing, assessment of performance of practical skills, solution of situational tasks, assessment of activity in class.

Final control: balance

Evaluation of the current educational activity in a practical session:

- Evaluation of theoretical knowledge on the subject of the lesson:
 - methods: survey, solving a situational problem;
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.
- Evaluation of practical skills and manipulations on the subject of the lesson:
 - methods: assessment of the correctness of the performance of practical skills
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.

The grade for one seminar session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Current assessment criteria for practical training:

Rating	Evaluation criteria
Perfectly "5"	It is presented to the applicant when he shows deep, solid and systematic knowledge in the scope of the curriculum, answers all questions without mistakes, reasonably formulates conclusions, using materials presented for independent work of the applicant, competently and consistently, with knowledge of the methodology, completed practical work ; using scientific terms and concepts correctly.
Fine "4"	The acquirer reveals the main content of the educational material; gives incomplete definitions of concepts; admits inaccuracies when using scientific terms, vaguely formulates conclusions, performed practical work, but made minor mistakes during the research.
Satisfactorily "3"	The applicant reproduces the basic educational material, but makes significant mistakes when presenting it, gives simple examples, definitions of concepts are insufficient, characterizes general issues of social medicine.
Unsatisfactorily "2"	The applicant discloses the content of the educational material fragmentarily, makes gross mistakes in the definition of concepts and when using terminology, did not complete the practical work.

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

Assessment is carried out in the last class before the beginning of the examination session (with the tape system of learning. The grade for the assessment is the arithmetic mean of all components on a traditional four-point scale and has a value that is rounded to 2 (two) decimal places using the statistical method.

9. Distribution of points received by students of higher education

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

Conversion table of a traditional assessment into a multi-point scale

Traditional four-point scale	Multipoint 200-point scale
Excellent ("5")	185 - 200
Good ("4")	151 - 184
Satisfactory ("3")	120-150
Unsatisfactory ("2")	Below 120

A multi-point scale (200-point scale) characterizes the actual success of each applicant in learning the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

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

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is assigned to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored 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

Evaluation on the ECTS scale	Statistical indicator
A	Top 10% achievers
B	The next 25% of earners
C	The next 30% of earners
D	The next 25% of earners
E	The next 10% of earners

10. Methodological support:

- Working program of the academic discipline
- Syllabus of the academic discipline
- Multimedia presentations
- Methodical developments for practical classes

11. Questions for final control:

1. Immunoprophylaxis, the purpose of immunization. Vaccine prophylaxis.

2. Concept of vaccine. Principles of classification.
3. Classification of vaccines with representatives.
4. Live vaccines. Methods of obtaining. Disadvantages and advantages. Examples.
5. Killed vaccines. Methods of obtaining. Disadvantages and advantages. Examples.
6. Anatoxins. Methods of obtaining. Disadvantages and advantages. Examples.
7. Recombinant vaccines. Methods of obtaining. Disadvantages and advantages. Examples.
8. Indications for vaccination (scheduled, according to epidural indications).
9. Requirements for vaccines. The concept of the "ideal" vaccine.
10. Routes of administration (with an example of vaccines.)
11. Periods of immune response by antibody titer.
12. Conditions of storage and transportation of vaccines.
13. Purpose of cold chain equipment
14. Cold chain levels.
15. Definition of terms: vaccination, revaccination, primary vaccine complex. An example from the vaccination calendar.
16. Order of vaccinations by age.
17. Features of vaccination against tuberculosis (type of vaccine, route of administration, who should be vaccinated, at what age, features of children with low body weight, up to what age it is possible without a preliminary Mantoux test, revaccination).
18. Features of vaccination against hepatitis B (type of vaccine, route of administration, who is to be vaccinated, at what age, features of children with low body weight, differences when the mother of the newborn is HBsAg "-", HBsAg "+" (positive) or the status is not determined.)
19. Features of vaccination against diphtheria, tetanus and pertussis (type of vaccine, route of administration, who is to be vaccinated, at what age, revaccination)
20. Features of vaccination against poliomyelitis (type of vaccine, route of administration, who is to be vaccinated, at what age, with which vaccine, features of vaccination of children who are surrounded by HIV-infected people.)
21. Features of vaccination against Hib infection.
22. Features of vaccination against measles, mumps and rubella (type of vaccine, route of administration, who is to be vaccinated, at what age, with which vaccine, features of vaccination of HIV-infected children)
23. Medical contraindications for vaccinations (absolute, relative)
24. Features of the combination of drugs for vaccination.
25. Tactics of vaccination of children with a violation of the calendar.
26. Tactics of vaccination of persons who are often sick and with chronic diseases.
27. Features of vaccination of HIV-infected persons.
28. Vaccination scheme against viral hepatitis B, persons with malignant neoplasms, persons undergoing hemodialysis and receiving multiple long-term transfusions of donor blood or its preparations
29. Features of vaccination of pregnant women.
30. Vaccinations carried out in endemic and enzootic areas and for epidemic indications.
31. Categories to be vaccinated against tularemia. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
32. Categories to be vaccinated against plague. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
33. Categories to be vaccinated against yellow fever. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
34. Categories to be vaccinated against anthrax. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
35. Categories to be vaccinated against meningococcal infection. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
36. Categories to be vaccinated against typhoid fever. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)

37. Categories subject to vaccination against hepatitis A. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
38. Categories to be vaccinated against tick-borne encephalitis. (dates for starting vaccination, revaccination dates, dose, type of vaccine, route of administration, indications, contraindications)
39. Indications for emergency prevention of tetanus.
40. Features of emergency prevention of tetanus depending on data on previous vaccination.
41. Peculiarities of emergency prevention of rabies depending on the damage and data on the animal.
42. Method of administration of anti-diphtheria serum.
43. Definition of terms: post-vaccination period, adverse events after immunization, post-vaccination reactions, post-vaccination complications, complicated course of the post-vaccination period.
44. Post-vaccination reactions. Types (general, local). Reasons.
45. Post-vaccination complications. Kinds Reasons.
46. Diagnosis of reactions and complications (methods: clinical, laboratory, epidemiological and statistical).
47. Criteria for connection of events in the post-vaccination period with vaccination.
48. Features of diagnosis of PVU, criteria of diff. diagnostics.
49. Clinical criteria for the differential diagnosis of PVC.
50. Treatment of post-vaccination pathology and emergency conditions.
51. Prevention of PVP.
52. Monitoring of PVC and PVR
53. Timing of development of possible adverse events after immunization (reactions and complications).

12. Recommended literature

Main:

1. Immunotherapeutic and Immunoprophylactic Strategies for Infectious Diseases. N.p., Frontiers Media SA, 2020.

Additional:

1. Clinical immunology and allergology: Textbook/ H.M. Dranik, O.S. Prylutskyi, Yu.I. Bazhora et al. ; under the editorship Prof. AHM. Dranika. - K.: Zdrovya, 2006. - 888 p.
3. Kazmirchuk V. E., Kovalchuk L. V. Clinical immunology and allergology. - Vinnytsia: Nova kniga, 2006, 504 p.
4. Andreychyn M.A., Chopyak V.V., Gospodarskyi I.Ya. Clinical immunology and allergology: Textbook - Ternopil: Ukrmedknyga, 2005. - 372 p.

13. Electronic information resources

- World Health Organization www.who.int
- Cochrane Center for Evidence-Based Medicine www.cebm.net
- Cochrane Library www.cochrane.org
- US National Library of Medicine - MEDLINE www.ncbi.nlm.nih.gov/PubMed
- Canadian Center for Evidence in Health Care www.cche.net
- Center for Disease Control and Prevention www.cdc.gov
- Public Health Center of the Ministry of Health of Ukraine www.phc.org.ua
- Ukrainian database of medical and statistical information "Health for all":
<http://medstat.gov.ua/ukr/news.html?id=203>
- British Medical Journal www.bmj.com
- Journal of Evidence-Based Medicine www.evidence-basedmedicine.com