
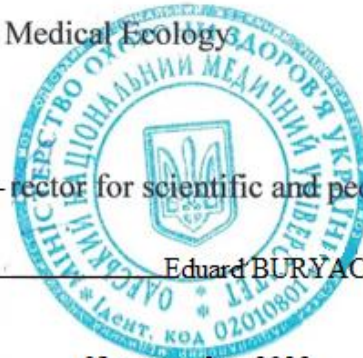


**MINISTRY OF HEALTH PROTECTION OF UKRAINE**

**ODESSA NATIONAL MEDICAL UNIVERSITY**

Department of Hygiene and Medical Ecology

  
\_\_\_\_\_  
Vice-rector for scientific and pedagogical work



**APPROVE**

Eduard BURYACHKIVSKY

01 september 2023

**WORKING PROGRAM OF EDUCATIONAL DISCIPLINE**

**" ENVIRONMENTAL MEDICINE "**

**Level of higher education:** second (master's degree )

**Field 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 ).

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The work program was approved at the meeting of the department of hygiene and medical ecology Protocol No. 1 dated August 30 , 2023.

Head of Department  Volodymyr BABIENKO

Agreed with the OPP guarantor  Valeria MARICHEREDA

Approved by the subject cycle methodical commission for medical and biological disciplines of ONMedU Protocol No. \_\_ from " \_\_ " \_\_\_\_\_ 2023

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 modules: 4	Branch of knowledge 22 "Health care"	<i>Full-time education</i> <i>Elective discipline</i>
	Specialty 222 "Medicine"	<i>Year of training: 4</i>
	Level of higher education second (master's )	<i>Semester VII</i>
		<i>Lectures ( 0 hours)</i>
		<i>Seminars (30 hours)</i>
		<i>Practical ( 0 hours)</i>
		<i>Laboratory (0 hours)</i>
		<i>Independent work (60 hours)</i>
		<i>including individual tasks (0 hours)</i>
		<i>The form of final control is credit</i>

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

**Purpose :** detailed study of the fundamentals of the structure and functioning of natural and man-made systems using quantitative assessment methods.

**Task:**

1. Study of the peculiarities of the organization of life in connection with anthropogenic influence on natural systems.
2. Creation of scientific foundations for rational exploitation of biological resources.
3. Forecasting changes in nature that occur as a result of the influence of human activity.
4. Preservation of human habitat.

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

General ( 3K ):

ZK 1 - Ability to abstract thinking , analysis and synthesis .

ZK 2 - Ability to learn and master modern knowledge .

ZK 3 - Ability to apply knowledge in practical situations .

ZK 4 - Knowledge and understanding of the subject area and understanding of professional activity .

ZK 5 - Ability to adapt and act in a new situation .

ZK 6 - Ability to make informed decisions .

ZK 7 - Ability to work in a team .

ZK 8 - Skills of interpersonal interaction .

ZK 9 - Ability to communicate in the state language both orally and in writing .

ZK 10 - Ability to communicate in a foreign language .

ZK 11 - Skills of using information and communication technologies .

ZK 12 - Determination and perseverance in relation to assigned tasks and assumed duties .

ZK 13 - Ability to act socially responsibly and consciously .

ZK 14 - Efforts to preserve the environment .

**Special (SK):**

SK2 – Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results.

SK 13 - Ability to carry out sanitary and hygienic and preventive measures.

SK14- Ability to plan and carry out preventive and anti-epidemic measures regarding infectious diseases.

**Program learning outcomes (PRL):**

PRN1 To 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.

PRN2 Understanding and knowledge of fundamental and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.

PRN3 Specialized conceptual knowledge, which 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.

PRN19 Plan and implement a system of anti-epidemic and preventive measures regarding the occurrence and spread of diseases among the population.

PRN20 Analyze the epidemiological situation and carry out measures for mass and individual, general and local prevention of infectious diseases.

PRN21 Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.

PRN23 Assess the impact of the environment on the state of human health to assess the state of morbidity in the population.

PRN24 To organize the necessary level of individual safety (own and the persons they care about) in case of typical dangerous situations in the individual field of activity.

PRN25 Clearly and unambiguously communicate own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists.

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

**To know:** methods of researching the state of the environment and the laws of its influence on a person, in particular and society in general, as well as the peculiarities of the reverse reactions of the environment response to human activity

**Be able:**

- To study the state of health of people and establish the features of dynamic changes from its main indicators in natural-historical, socio-economic and physiological-hygienic aspects;
- To study the impact of certain environmental factors on the health and vital activities of certain populations; To study the processes of preservation and restoration of health and social and labor potential of the population;
- To predict the state of health of future generations;
- Analyze global and regional problems of human ecology;
- To develop a way to increase the level of health and social and labor potential of certain sections of the

population;

- Conduct anthropoecological monitoring - introduction of an effective system of monitoring changes in people's life processes in connection with the impact of various environmental factors on them ;
- Compilation of medico-geographical maps reflecting the territorial differentiation of population diseases associated with the deterioration of the environment ;
- The definition is scientifically based and the meaning is marginal permissible man-made loads on the human body, etc

### 3. Content of the academic discipline

#### **Content module 1. Ecology as a science. Biosphere.**

Topic 1 Human ecology. Tasks, global environmental problems, methods of ecology

Topic 2 Biosphere and its structure. Circulation of substances in the biosphere. Functions of the biosphere

Topic 3 Structure, composition and properties, hygienic value of the atmosphere , lithosphere and hydrosphere

#### **Content module 2. Air pollution, their impact on health. Protection against contamination**

Topic 4 Air pollution and its impact on public health

Topic 5 Main chemical pollutants of the atmosphere

Topic 6 Physical pollution of the atmosphere

Topic 7 Atmospheric effects of atmospheric pollution

#### **Content module 3. Pollution of the hydrosphere, their impact on health. Protection against contamination**

Topic 8 Problems of quantity and quality of water in the hydrosphere. Anthropogenic impact on the hydrosphere

Topic 9 Water pollution and its impact on human health.

Topic 10 Drinking water problems in Ukraine. Protective measures and legislative documents.

#### **Content module 4. Pollution of the lithosphere , their impact on health. Protection against pollution**

Topic 11 Pollution of the lithosphere (soil) and its impact on human health

Topic 12 Natural and anthropogenic soil pollution . Classification of soil pollutants .

Topic 13 Exogenous chemical substances of purposeful introduction into the soil

Topic 14 Soil pollutants with household and industrial waste

Topic 15 Industrial atmospheric emissions . Exhaust gases of vehicles . Radioactive soil contamination. Soil protection from pollution

### 4. The structure of the academic discipline

Names of topics	Number of hours				
	That's all	including			
		lectures	seminars	practical	laboratory
<b>Content module 1. Ecology as a science. Biosphere.</b>					

Topic 1 Human ecology. Tasks, global environmental problems, methods of ecology	6		2			4
Topic 2 Biosphere and its structure. Circulation of substances in the biosphere. Functions of the biosphere	6		2			4
Topic 3 Structure, composition and properties, hygienic value of the atmosphere, lithosphere and hydrosphere	6		2			4
<i>Together according to content module 1</i>	<i>18</i>		<i>6</i>			<i>12</i>
<b>Content module 2. Air pollution, their impact on health. Protection against contamination</b>						
Topic 4 Air pollution and its impact on public health	6		2			4
Topic 5 Main chemical pollutants of the atmosphere	6		2			4
Topic 6 Physical pollution of the atmosphere	6		2			4
Topic 7 Atmospheric effects of atmospheric pollution	6		2			4
<i>Together according to content module 2</i>	<i>24</i>		<i>8</i>			<i>16</i>
<b>Content module 3. Pollution of the hydrosphere, their impact on health. Protection against contamination</b>						
Topic 8 Problems of quantity and quality of water in the hydrosphere. Anthropogenic impact on the hydrosphere	6		2			4

Topic 9 Water pollution and its impact on human health.	6		2			4
Topic 10 Drinking water problems in Ukraine. Protective measures and legislative documents.	6		2			4
<i>Together according to content module 3</i>	<i>18</i>		<i>6</i>			<i>12</i>
<b>Content module 4. Pollution of the lithosphere , their impact on health. Protection against contamination</b>						
Topic 11 Pollution of the lithosphere (soil) and its impact on human health	6		2			4
Topic 12 Natural and anthropogenic soil pollution . Classification of soil pollutants .	6		2			4
Topic 13 Exogenous chemical substances of purposeful introduction into the soil	6		2			4
Topic 14 Soil pollutants with household and industrial waste	6		2			4
Topic 15 Industrial atmospheric emissions . Exhaust gases of vehicles . Radioactive soil contamination. Soil protection from pollution	6		2			4
<i>Together according to content module 4</i>	<i>30</i>		<i>10</i>			<i>20</i>
<i>Individual tasks</i>						
<b><i>Together</i></b>	<b>90</b>		<b>30</b>			<b>60</b>

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

### 5.1 Topics of lectures

Lectures are not provided.

### 5.2. Topics of practical classes

Practical classes are not provided.

### 5.3. Topics of seminar classes

No	Topic	Number of hours
1	Human ecology. Tasks, global environmental problems, methods of ecology	2
2	Biosphere and its structure. Circulation of substances in the biosphere. Functions of the biosphere	2
3	Structure, composition and properties, hygienic value of the atmosphere , lithosphere and hydrosphere	2
4	Atmospheric air pollution and its impact on public health	2
5	The main chemical pollutants of the atmosphere	2
6	Physical pollution of the atmosphere	2
7	Atmospheric effects of atmospheric pollution	2
8	Problems of quantity and quality of water in the hydrosphere. Anthropogenic impact on the hydrosphere	2
9	Water pollution and its impact on human health.	2
10	Drinking water problems in Ukraine. Protective measures and legislative documents.	2
11	Pollution of the lithosphere (soil) and its impact on human health	2
12	Natural and anthropogenic soil pollution. Classification of soil pollutants.	2
13	Exogenous chemical substances purposefully introduced into the soil	2
14	Soil pollutants with household and industrial waste	2
15	Industrial atmospheric emissions . Exhaust gases of vehicles . Radioactive soil contamination. Soil protection from pollution	2
<b>Together</b>		<b>30</b>

### 5.4. Topics of laboratory classes



Laboratory classes are not provided .

## 6. Independent work of a student of higher education

No	Title of the topic / types of tasks	How many hours?
	Topic 1. Preparation for practical classes 1	4
	Topic 2. Preparation for practical classes 2	4
	Topic 3. Preparation for practical classes 3	4
	Topic 4. Preparation for practical classes 4	4
	Topic 5. Preparation for practical classes 5	4
	Topic 6. Preparation for practical classes 6	4
	Topic 7. Preparation for practical classes 7	4
	Topic 8. Preparation for practical classes 8	4
	Topic 9. Preparation for practical classes 9	4
	Topic 10. Preparation for practical classes 10	4
	Topic 11. Preparation for practical classes 11	4
	Topic 12. Preparation for practical classes 12	4
	Topic 13. Preparation for practical classes 13	4
	Topic 14. Preparation for practical classes 14	4
	Topic 14. Preparation for practical classes 15	4
	<b>Together</b>	<b>60</b>

## 7. Teaching methods

**Practical classes:** conversation, solving situational problems, practicing skills, filling out protocols on the subject of classes, performing laboratory studies.

**Independent work:** independent work with recommended basic and additional literature, with electronic information resources.

## 8. Forms control and evaluation methods

(in including evaluation criteria results teaching)

**Current control:** oral survey, testing, evaluation of practical performance skills, assessment implementation work with appliances, solution situational tasks, assessment activity on occupation

**Final control :** credit.

### Evaluation of the current educational activity in a practical lesson :

1. 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.
2. Assessment of practical skills on the topic 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 practical 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 evaluation criteria in practical training

Rating	Evaluation criteria
"5"	The student is fluent in the material, takes an active part in discussing and solving the situational problem, confidently demonstrates practical skills, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
"4"	The student has a good command of the material, participates in the discussion and solution of the situational problem, demonstrates practical skills with some errors, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
"3"	The applicant does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational problem, demonstrates practical skills with significant errors.
"2"	The applicant does not possess the material, does not participate in the discussion and solution of the situational problem, does not demonstrate practical skills.

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.

Test is carried out: at the last lesson before the beginning of the examination session - at ribbon system teaching, on to the last occupation - with a cyclical system of education. The credit score is the arithmetic mean of all components on a traditional four-point scale and has a value that is rounded using the statistical method with two decimal places after the decimal point.

### 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
OK ( " 4 " )	151 - 184

Satisfactory ( " 3 " )	120-150 _ _
Unsatisfactory ( " 2 " )	Below 120

Multi-point scale (200-point scale) characterizes the actual success of each applicant in mastering 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 given 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**

<b>Evaluation on the ECTS scale</b>	<b>Statistical indicator</b>
AND	Top 10% achievers
IN	The next 25% of earners
WITH	The next 30% of earners
D	The next 25% of earners
IS	The next 10% of earners

### **10. Methodological support**

- Working program of the academic discipline
- Syllabus
- Methodical developments for practical classes
- Methodical recommendations for independent work of higher education applicants
- Multimedia presentations
- Situational tasks

### **11. Questions for preparing for the final inspection**

- 1 Human ecology, global environmental problems and methods of ecology
- 2 Biosphere and its structure.
- 3 Cycle of substances in the biosphere.
- 4 Functions of the biosphere

- 5 Structure, composition and properties, hygienic value of the atmosphere , lithosphere and hydrosphere
- 6 Atmospheric air pollution and its impact on public health
- 7 Main chemical pollutants of the atmosphere
- 8 Physical pollution of the atmosphere
- 9 Atmospheric effects of atmospheric pollution
- 10 Problems of quantity and quality of water in the hydrosphere.
- 11 Anthropogenic impact on the hydrosphere
- 12 Water pollution and its impact on human health.
- 13 Problems of drinking water in Ukraine.
14. Protective measures of drinking water of Ukraine and legislative documents.
- 15 Pollution of the lithosphere (soil) and its impact on human health
- 16 Natural and anthropogenic soil pollution .
- 17 Classification of soil pollutants .
- 18 Exogenous chemical substances purposefully introduced into the soil
- 19 Soil pollutants with household and industrial waste
- 20 Industrial atmospheric emissions .
- 21 Exhaust gases of vehicles .
- 22 Radioactive soil contamination.
- 23 Soil protection from pollution
- 24 Environmental disasters of Ukraine
- 25 Methods of protection against electromagnetic radiation
- 26 The effect of ultraviolet radiation on the body.
- 27 Methods of protection against ultraviolet radiation
- 28 The effect of infrared radiation on a person
- 29 Methods of protection against infrared radiation
- 30 Itai-itai and Minamata diseases as a consequence of environmental pollution

## 12. Recommended literature

### Main:

1. Hygiene propaedeutics; textbook: in 2 vols. T1/ V.V., Babienko, A.V. Mokiienko - Odesa: Press-courier, 2022. 400p.
2. Hygiene propaedeutics; textbook: in 2 volumes T2/ V.V. Babienko, A.V. Mokiienko - Odesa: Press-courier, 2022. 400p.
3. Water hygiene and water supply of populated areas: a study guide/ Babienko V.V., Mokiienko A.V. – Odesa: Press Courier, 2021, 327 p.
4. Hygiene and ecology: textbook / [V. H. Bardov, S. T. Omelchuk, N. V. Merezhkina and others] ; in general ed. V. G. Bardov. – Vinnytsia: Nova Kniga, 2020. – 472 p. ISBN 978-966-382-830-5

### Additional:

1. Pharmaceutical hygiene.: study guide/ V.V., Babienko, A.V. Mokiienko, O.A. Gruzevskyi - Odesa: Press-courier, 2022. 324 p.
2. "Hygiene in the practice of a dentist"; educational and methodological manual/ Babienko V.V., Mokiienko A.V., Kobolev E.V./ Odesa: Press-courier. 2022 180 p.

## 13. Electronic information resources

1. <http://moz.gov.ua> – Ministry of Health of Ukraine
2. [www.ama-assn.org](http://www.ama-assn.org) - American Medical Association / AmericanMedicalAssociation
3. [www.who.int](http://www.who.int) - World Health Organization
4. [www.dec.gov.ua/mtd/home/](http://www.dec.gov.ua/mtd/home/) - State Expert Center of the Ministry of Health of Ukraine
5. <http://bma.org.uk> - British Medical Association
6. [www.gmc-uk.org](http://www.gmc-uk.org) - General Medical Council ( GMC )
7. [www.bundesaerztekammer.de](http://www.bundesaerztekammer.de) – German Medical Association