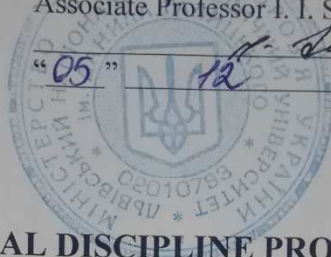


DANYLO HALYTSKY LVIV NATIONAL MEDICAL UNIVERSITY
Department of Social Medicine, Economics and Organization of Health Care

«APPROVED»

First Vice-Rector for Research and Pedagogical Work
Associate Professor I. I. SOLONYNKO

“05” 12 2023




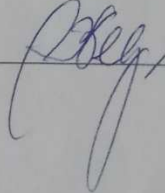
EDUCATIONAL DISCIPLINE PROGRAM

"THE METHODOLOGY OF THE EVIDENCE-BASED MEDICINE" VB1.49

for the training of second-level (master's) higher education professionals
in the field of knowledge 22 "Healthcare" specialty 222 "Medicine"



Discussed and approved
at the methodical meeting of the department
of Social medicine, economics and
organization of Health care
Danylo Halytsky LNMU
(minute No 8 dated 13 June 2023)
Head of the department
Associate Professor  T. G. GUTOR

Approved by
the Specialized methodical commission
of Preventive medicine
Danylo Halytsky LNMU
(minute No 4 dated 15 June 2023)
Head of methodical commission of Preventive
medicine
Professor  V. I. FEDORENKO



THE PROGRAM IS DESIGNED BY: The Head of the Department of Social Medicine, Economics and Organization of Health Care, Ph.D., Associate Professor T. H. GUTOR, Assistant N.F. TIMCHENKO, assistant Z. S. MYSAK

REVIEWERS:

FEDORENKO V.I. – Professor, Doctor of Medical Sciences (MD), Professor of the Department of General Hygiene with Ecology at the Danylo Halytsky National Medical University

LIUBINETS O.V. – Professor, Doctor of Medical Sciences (MD), Head of the Department of the Public Health at the Danylo Halytsky National Medical University

INTRODUCTION

The program of the elective course «**The Methodology of the Evidence-based Medicine**» is worked out according to the Educational and professional program " *Medicine* " Standard of higher education of the *second (master's) level* field of knowledge 22 "*Health*" specialty 222 "*Medicine* "

DESCRIPTION OF THE ELECTIVE COURSE

The elective course «The methodology of the evidence-based medicine» envisages the mastering:

- the information concerning the problems of evidence approach in the health care field;
- potential disclosure of evidence-based medicine as a technology for maintaining good health and increasing the quality of life.

Structure of academic discipline	Number of credits, hours, out them			Self-independent study	Year of study semester/term	Form of control
	Total	Classroom hours				
		lectures (hours)	Practical classes (hours)			
Name of the academic discipline “The Methodology of the evidence-based medicine”	2 credits / 60 hours	—	26	34	4-year (VII/VIII term)	credit

The subject of studies of the elective course is modern principles of evidence-based medicine, levels of evidence and degrees of recommendations, key notions of clinical epidemiology, and rules of carrying out the clinical trials.

Interdisciplinary connections

The choice/elective course «The Methodology of the evidence-based medicine» as the academic discipline:

- is based on the studies of academic disciplines by students: history of medicine, medical informatics, ethics, hygiene and ecology, epidemiology, sociology, and medical sociology;
- lays the foundations of studies on the scientifically-evident practice in Ukraine and world experience;
- promotes the formation of skills using the database of evidence-based medicine in doctors' practical activities.

1. THE AIM AND TASKS OF THE ELECTIVE COURSE

1.1 **The aim** of studies of the elective course «The Methodology of the evidence-based medicine» is to form in students the knowledge of the evidence-based medicine as the foundations of the state health care policy and medical provision as well as the acquisition of practical skills and experience by the future doctors for critical evaluation of the medical information to use it rationally and effectively in further practical activity.

1.2 **The main tasks** of studies of the elective course «The Methodology of the evidence-based medicine» are:

- ✓ to provide the students with knowledge as to the main terms of evidence-based medicine;
- ✓ to teach the students to distinguish the main types of clinical trials;
- ✓ to teach the students skills of database usage of the evidence-based medicine;
- ✓ to teach the students to evaluate the medical information critically by using the filters of the evidence-based medicine;
- ✓ to teach the students to evaluate the clinical instructions critically.

1.3 **Competences and the results of studies**, the formation of which is promoted by a discipline.

According to the Standard demands, it is the discipline that helps the students to become **competent**:

General competences (GC)

- GC-1 – Ability to abstract thinking, analysis and synthesis.
- GC-2 – Ability to learn and master modern knowledge.
- GC-3 – Ability to apply knowledge in practical situations.
- GC-4 – Knowledge and understanding of the subject area and understanding of professional activity.
- GC-5 – Ability to adapt and act in a new situation.
- GC-6 – Ability to make informed decisions.
- GC-7 – Ability to work in a team.
- GC-8 – Ability to interpersonal interaction.
- GC-9 – Ability to communicate in a foreign language.
- GC-10 – Ability to use information and communication technologies.
- GC-11 – Ability to search, process and analyze information from various sources.
- GC-12 – Definiteness and perseverance in terms of tasks and responsibilities.
- GC-13 – Awareness of equal opportunities and gender issues.
- GC-14 – The ability to exercise their rights and responsibilities as a member of society, to be aware of the values of civil (free democratic) society and the need for its sustainable development, the rule of law, human and civil rights and freedoms in Ukraine.
- GC-15 – Ability to preserve and multiply 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, society and in the development of society, techniques and technologies. active recreation and leading a healthy lifestyle, use different types and forms of physical activity for active recreation and a healthy lifestyle-

- Special (professional, subject) competences (PC)

- PC-1 – Ability to collect medical information about the patient and analyze clinical data.
- PC-11 – Ability to solve medical problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility.
- PC-13 – Ability to carry out sanitary and hygienic, preventive measures.
- PC-14 – Ability to plan and carry out preventive and anti-epidemic measures against infectious diseases.
- PC-15 – Ability to conduct an examination of working capacity.
- PC-16 – Ability to keep medical records, including electronic forms.
- PC-17 – Ability to assess the impact of the environment, socio-economic and biological determinants on the health state of the individual, family, population.
- PC-18 – Ability to analyze the activities of a doctor, subdivision, health care institution, ensure the quality of medical care and improve the efficiency of the use of medical resources.
- PC-19 – Ability to organize and integrate the provision of medical care to the population and the marketing of medical services.
- PC-20 – Ability to conduct epidemiological and medical-statistical studies of public health; processing of social, economic and medical information.
- PC-21 – Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to specialists and non-specialists, in particular to students.
- PC-22 – Ability to manage workflows, in the field of health care, which are complex, unpredictable and require new strategic approaches
- PC-23 – Ability to develop and implement scientific and applied projects in the field of health care.
- PC-24 – Adherence to ethical principles when working with patients, laboratory animals.
- PC-25 – Adherence to professional and academic integrity, to be responsible for the accuracy of the obtained scientific results

Detailing of competencies according to NQF descriptors in the form of "Competence Matrix"

Matrix of competences

№	Competence	Knowledge	Skills	Communication	Autonomy and responsibility
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		Kn1 - Critical understanding of problems in the field and on the border of fields of knowledge	S1 - Ability to solve problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects	C1 - Use of foreign languages in professional activity	AR1 - Responsibility for contributing to professional knowledge and practice and / or evaluating the results of activity of teams and collectives
		Kn2 - Specialized conceptual knowledge, which includes modern scientific achievements in the field of professional activity or field of knowledge and is the basis for original thinking and conducting research	S2 - Ability to integrate knowledge and solve complex problems in broad or multidisciplinary contexts	C2 - Clear and unambiguous communication of own knowledge, conclusions and arguments to specialists and non-specialists, in particular to students	AR2 - Managing work or learning processes, which are complex, unpredictable and require new strategic approaches
			S3 - Specialized problem-solving skills/abilities required for conducting researches and / or innovative activity in order to develop new knowledge and procedures		AR3 - Ability to continue studies with a high degree of autonomy
1	Ability to collect medical information about the patient and analyze clinical data.	Kn1	S1	C1	AR1
2	Ability to solve medical problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility	Kn1	S1	C2	AR1
3	Ability to carry out sanitary and hygienic, preventive measures	Kn1	S2	C2	AR1
4	Ability to plan and carry out preventive and anti-epidemic measures against infectious diseases.	Kn1	S1	C2	AR1
5	Ability to conduct an examination of working capacity	Kn1	S3	C2	AR2
6	Ability to keep medical records, including electronic forms	Kn1	S3	C2	AR2
7	Ability to assess the impact of the environment, socio-economic and biological determinants on the health state of the individual, family, population.	Kn1	S1	C2	AR2
8	Ability to analyze the activities of a doctor, subdivision, health care institution, ensure the quality of medical care and improve the efficiency of the use of medical	Kn1	S1	C2	AR2

	resources				
9	Ability to organize and integrate the provision of medical care to the population and the marketing of medical services	Kn1	S2	C2	AR2
10	Ability to conduct epidemiological and medical-statistical studies of public health; processing of social, economic and medical information	Kn1	S2	C2	AR1
11	Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to specialists and non-specialists, in particular to students.	Kn1	S1	C1	AR1
12	Ability to manage workflows, in the field of health care, which are complex, unpredictable and require new strategic approaches	Kn1	S1	C2	AR1
13	Ability to develop and implement scientific and applied projects in the field of health care	Kn1	S1	C1	AR3
14	Adherence to ethical principles when working with patients, laboratory animals.	Kn2	S2	C2	AR2
15	Adherence to professional and academic integrity, to be responsible for the accuracy of the obtained scientific results	Kn1	S2	C1	AR3

Results of studies:

Program learning outcomes (PLO), the formation of which is facilitated by the discipline:

PLO-1 – Have a thorough knowledge of the structure of professional activity. Be able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, ability to further professional training with a high level of autonomy.

PLO-2 – Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient to solve professional problems in the field of health care.

PLO-3 – Specialized conceptual knowledge, which includes scientific achievements in the field of health care and is the basis for researches, critical understanding of problems in the field of medicine and related interdisciplinary problems.

PLO-15 – Organize the provision of medical care, medical and evacuation measures to the population and servicemen in the conditions of emergency situations and military operations, taking into account the field conditions.

PLO-16 – To form rational medical routes of patients; to organize interaction with colleagues in their own and other institutions, the organizations and establishments; to apply tools for the promotion of medical services on the market, based on the analysis of the needs of the population, in the conditions of functioning of the health care institution, its subdivision, in a competitive environment.

PLO-18 – Determine the state of functioning and limitations of a person's life and duration of incapacity for work with the execution of the relevant documents, in the conditions of the health care facility on the basis of data on the disease and its course, features of professional activity of a person, etc. Maintain medical records of the patient and the population on the basis of regulatory documents.

PLO-19 – Plan and implement a system of anti-epidemic and preventive measures for the occurrence and spread of diseases among the population.

PLO-20 – Analyze the epidemiological state and carry out measures of mass and individual, general and

local prevention of infectious diseases.

PLO-21 – Search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.

PLO-22 – Apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex health care problems.

PLO-23 – Assess the impact of the environment on state of human health to assess the incidence state of the population.

PLO-24 – Organize the necessary level of individual safety (own and persons cared for) in case of typical dangerous situations in the individual field of activity.

PLO-25 – Clearly and unambiguously convey their own knowledge, conclusions and arguments on health care issues and related issues to professionals and non-specialists.

PLO-26 – Manage workflows in the field of health care, which are complex, unpredictable and require new strategic approaches, organize the work and professional development of staff based on acquired skills of effective teamwork, leadership positions, proper quality, accessibility and fairness, ensuring the provision of integrated health care assistance.

PLO-27 – Communicate fluently in the state and English languages, both orally and in writing to discuss professional activities, researches and projects.

PLO-28 – Make effective decisions on health care issues, assess resources, take into account social, economic and ethical implications.

PLO-29 – Plan, organize and conduct activities for the specific prevention of infectious diseases, in accordance with the National Calendar of preventive vaccinations, both mandatory and recommended. Manage vaccine residues, organize additional vaccination campaigns, including immunoprophylaxis measures.

Results of studies for the academic discipline:

- In future doctors, to form the practical skills to adhere to the principles of the evident practice.
- The acquisition of skills concerning the information resources of evidence-based medicine in decision-making as to diagnosis, treatment, and prevention of diseases.
- To master the basics of carrying out the statistical analysis of medical data.
- To know the ethical-organizational principles of carrying out the clinical trials.
- Be able to evaluate the effectiveness of screening programs and interpret the obtained results.

2. THE INFORMATION VOLUME OF THE ACADEMIC DISCIPLINE

To study the academic discipline, 2 credits ECTS 60 hours are stipulated. The academic discipline is being studied by the 4-year students in the form of the choice/elective course.

Theme 1. The history of development and the international experience of the evidence-based medicine

The notion of evidence-based medicine. The prerequisites of origin and foundation of evidence-based medicine. The aim and tasks of evidence-based medicine. The history of the development of evidence-based medicine. The evidence-based medicine in the clinical practice of Ukraine and countries of the world. The international experience of usage of evidence-based medicine.

Theme 2. The basics of the statistical analysis of the medical data

The requirements for statistical data. The methods of research in evidence-based medicine. The statistical processing of data (the calculation of the average and relative values, criteria of their reliability). The statistical research. The main stages of the statistical research.

Theme 3. The key notions of the clinical epidemiology

The term «clinical epidemiology». The regulations of clinical epidemiology. The essence of clinical epidemiology. Death. Disease. Discomfort. Disability. Dissatisfaction. The Methodology of the evidence-based medicine. The epidemiological method. The interconnection between evidence-based medicine and clinical epidemiology and biological statistics.

Theme 4. The ethical problems in epidemiology

The ethical standards in epidemiology. The regulations of research ethics. The ethical consider-

ation in the study. The phenomenon of accidental discovery. The ethical problems of the placebo application in clinical trials. The International guides the ethical expert examination in epidemiological research.

Theme 5. The design of the epidemiological research

The types of the design and their characteristics. The aim and tasks of the epidemiological research. The peculiarities of carrying out epidemiological research. Continuous research. The sample (randomized) studies. The representativeness of a sample. The principles of randomization. The mechanical selection. The typological (typical) selection. The serial (cluster) selection. The method of the directed selection. Accident-control. The supervisory study. The experimental study. The scientific (special) research. The routine research. The synchronous (transverse/diametrical) research. The dynamic research. The field researches.

Theme 6. The epidemiological research in the health care system, their classification

The experimental research. The descriptive (estimated, uncontrolled). The analytical (controlled). The description of separate cases. The description of a series of cases. Retrospective research. Prospective research.

Theme 7. The stages of the evidence-based medicine

The formulation of the clinical question. The systematic search of the evidence-based data. The reliability assessment of the evidence-based data, and their clinical significance. The application of the obtained results in practice.

Theme 8. The 4-component PICO system

The types of clinical questions, the formulation of questions. The components of PICO: a patient, intervention, comparison, and result. The matrix for the formulation of the clinical questions. The assessment criteria of the results.

Theme 9. The randomized controlled trial

The analysis of articles and their critical assessment. The randomized controlled investigation/trial (PCI). The double-blind trial. The drawback of the randomized controlled investigation. The systematized review and meta-analysis.

Theme 10. ROC analysis in medicine.

The model of choice on ROC curves of decisive rules for diagnostic tests and optimum values of diagnostic indicators of medical and biological information is offered and proved. Standard criteria were used to assess the quality of diagnostic test prediction: sensitivity and specificity. To assess the significance of factor characteristics and compare the prognostic characteristics of the models used the method of constructing ROC curves and mathematical modeling. The definition of the optimal value of the diagnostic indicator based on the sensitivity of the test, which corresponds to its features, was found. The model was adapted to solve the situation when the level of sensitivity of the test is greater than its feature.

Theme 11. The formulation of the clinical problem by using the PICO principle

The sphere of the clinical problem. The types of the formulated questions. The composing of the clinical questions. The shortcomings (drawbacks) of the formulated clinical question. The factors necessary for the effective solution of the clinical problem.

Theme 12. The advantages and disadvantages of different sources of the medical information

The content of the scientific medical literature. The search of information on the Internet by using the filters of evidence-based medicine. The structure and content of the scientific publication. The main sections of the scientific publication. The database of the public health status (the European and domestic databases «Health for all»): design, filling, potentialities.

Theme 13. Multiple regression analysis as an element of predicting the impact of risk factors

Regression analysis to predict risk factors. Types of regression analysis. Methods for verifying the reliability of the forecasting model. Factor and effective features. Graphic image of the analysis.

Theme 14. Modern programs for statistical analysis of medical research

Use of modern statistical programs in the field of health care. The role of official statistics in the analysis of public health, its advantages and disadvantages. The Statistica program as an open system. The SPSS program. The package of statistical programs R. Comparison of calculations and methods of graphic image in programs.

Theme 15. The use of the obtained data in clinical practice

The use of the obtained data in practice. The introduction to the guide of the clinical practice. The definition, the need for development, and implementation. The obstacles to changing the practice. The standards of medical care to the population. The clinical recommendations are based on data from evidence-based medicine. The clinical protocols.

Theme 16. The principles and practice of carrying out an audit

The medical audit: the definition, purpose, and appointment. The principles and practice. The process of planning and conducting the audit. The clinical audit. The audit of the effectiveness of medical care. The analysis of mistakes.

Theme 17. The International Cocraine cooperation, its role in the efficiency of the medico-social intervention

The organization of the activity of the Cocraine cooperation. The logotype of the Cocraine cooperation. The basis of evidence-based medicine - randomized controlled clinical investigations - is the gold standard. The centers (groups) of the Cocraine reviews. The electronic publications of the Cocraine library. The principles of the Cocraine cooperation, the concept of three «E».

Theme 18. The evidence-based prophylactics

The definition of the term «evidence-based prophylactics». The notion of dynamic observation. The system of prevention is based on the principles of evidence-based medicine. The instructions for the working group as to USPSTF prophylactics. The register of the medico-technological documents as to standardization of the medical care in the health care system (HC) of Ukraine.

Theme 19. The role of patients in the scientific research

The adherence to the principles in carrying out the medico-biological experiment. The clinical investigations as the processing stage of the administrative decisions. The types of clinical investigations. The design of the clinical investigations. The duration of the clinical investigations.

Theme 20. The rights of patients in the scientific research

How to participate in the clinical trials. The ethics of the clinical trials. The obligations of the parties. Accidents. The Helsinki declaration of the World medical association «The ethical principles of the medical investigations with human participation as the object of study».

Theme 21. The screening - the source of information as to the public health status in epidemiological research

The screening. The assessment of screening results. The screening test requirements. The sensitivity and specificity of the screening test. The sensitivity and specificity of communication. The detection of risk factors in research «accident-control». The absolute, relative, and additional population risk: the calculation method and rating. The concept of chances in epidemiology. The detection of the ratio indicator of chances in the cohort study: the calculation method and rating.

Theme 22. The evidence-based medicine and marketing

The evidence-based medicine means promotion of the medical preparations. The signs of the incorrect advertising of medicines. The information that misleads the consumer. The unfair competition.

The notion of the endpoint surrogate point. The development of the National medical (pharmaceutical) policy.

Theme 23. The critical assessment of the evidence found its reliability and usefulness

The critical assessment of the evidence found (literature data), its reliability (proximity to truth), and usefulness of (clinical application). The main approaches in critical assessment of publications in the medical journals and other sources of information. The hierarchy of evidence in medicine. The systematic mistake. The types of systematic mistakes. The qualitative characteristics of evidence: the total/summary indicator of the methodological quality of the all-available research. The quantitative characteristics of the evidence (volume), the size of the effect, the number of investigations, and the summary size of the selection of patients. The levels of reliability of evidence. The size of selection (power), the duration of observation, and the completeness of observation. The consistency of evidence: the degree of coincidence of results of different research.

3. THE STRUCTURE OF THE DISCIPLINE

No	Themes	Lectures	Practical classes	Self-independent study	Individual tasks
1.	The history of development and the international experience of the evidence-based medicine	-	2	-	-
2.	The basics of the statistical analysis of the medical data	-	2	-	-
3.	The key concepts of the clinical epidemiology	-	-	3	-
4.	The ethical problems in epidemiology	-	-	3	-
5.	The design of the epidemiological trials	-	2	-	-
6.	The epidemiological trials in the health care system, their classification	-	2	-	-
7.	The stages of the evidence-based medicine	-	-	3	-
8.	The 4-component PICO system	-	-	3	-
9.	Randomized controlled studies	-	2	-	-
10.	ROC analysis in medicine	-	2	-	-
11.	The formulation of a clinical problem by applying the PICO principle	-	-	3	-
12.	The advantages and disadvantages of different sources of the medical information	-	-	3	-
13.	Multiple regression analysis as an element of predicting the impact of risk factors	-	2	-	-
14.	Modern programs for statistical analysis of medical research	-	2	-	-
15.	The usage of the obtained data in the clinical practice	-	-	4	-
16.	The principles and practice of carrying out an audit	-	-	4	-
17.	The International Cocraine cooperation, its role in the efficiency of the medico-social intervention	-	2	-	-
18.	The evidence-based prophylactics	-	2	-	-
19.	The role of patients in the scientific research	-	-	4	-
20.	The rights of patients in the scientific research	-	-	4	-
21.	The screening - the source of information as to the public health status in epidemiological research	-	2	-	-
22.	The evidence-based medicine and marketing	-	2	-	-
23.	The critical assessment of the evidence found its reliability and usefulness	-	2	-	-
Total hours 60 / 2,0 credits ECTS		0	26	34	0
Final control		Credit			

4. THEMATIC PLAN OF LECTURES – not provided

5. THE THEMATIC PLAN OF PRACTICAL CLASSES

No	Theme	Number of hours
1.	The history of development and the international experience of the evidence-based medicine	2
2.	The basics of the statistical analysis of the medical data	2
3.	The design of the epidemiological trials	2
4.	The epidemiological trials in the health care system, their classification	2
5.	Randomized controlled studies	2
6.	ROC analysis in medicine	2
7.	Multiple regression analysis as an element of predicting the impact of risk factors	2
8.	Modern programs for statistical analysis of medical research	2
9.	The International Cocraine cooperation, its role in the efficiency of the medico-social intervention	2
10.	The evidence-based prophylactics	2
11.	The screening - the source of information as to the public health status in epidemiological research	2
12.	The evidence-based medicine and marketing	2
13.	The critical assessment of the evidence found its reliability and usefulness	2
	Total	26

6. THE THEMATIC PLAN OF THE SELF-INDEPENDENT WORK

No	Theme	Number of hours	Type of control
1.	The key concepts of the clinical epidemiology	3	Current control on practical classes
2.	The ethical problems in epidemiology	3	Current control on practical classes
3.	The stages of the evidence-based medicine	3	Current control on practical classes
4.	The 4-component PICO system	3	Current control on practical classes
5.	The formulation of a clinical problem by applying the PICO principle	3	Current control on practical classes
6.	The advantages and disadvantages of different sources of the medical information	3	Current control on practical classes
7.	The usage of the obtained data in the clinical practice	4	Current control on practical classes
8.	The principles and practice of carrying out an audit	4	Current control on practical classes
9.	The role of patients in the scientific research	4	Current control on practical classes
10.	The rights of patients in the scientific research	4	Current control on practical classes
	Total	34	

7. INDIVIDUAL TASKS

The execution of the individual situational task which is stipulated for every theme of practical lesson and the theme of self-independent study must be provided.

The evaluation of the SIS (self-independent study) is made by a lecturer in the format « credited» or «not credited».

1. Verbal/oral methods: conversation, narration, explanation, work with literature.
2. Visual methods: illustration, demonstration, observation.
3. Practical methods: situational tasks, individual work, research work.
4. Interactive methods: discussion, work in small groups, brainstorming, case-method, business game.

8. TEACHING METHODS

1. Verbal methods: conversation, story, explanation, work with literature.
2. Visual methods: illustration, demonstration, observation.
3. Practical methods: situational tasks, independent work, research work.
4. Interactive methods: discussion, work in small groups, brainstorming, case method, business game.

9. METHODS OF CONTROL

1. Types of control - current and final.
2. The form of final control in accordance with the curriculum - credit
3. Evaluation criteria.

10. CURRENT CONTROL is carried out during the training sessions and aims to check the students' mastering of the training material (it is necessary to describe the forms of the current control during the training sessions on a 4-point (national) scale). Forms of assessment of current educational activities should be standardized and include control of theoretical and practical training.

10.1. Evaluation of current educational activities. During the assessment of mastering each topic for the current educational activity of the student, grades are given on 4 points (national). This takes into account all types of work provided by the program of the discipline. The student must receive a grade from each topic for further conversion of grades into points on a multi-point (200-point) scale.

11. THE FORM OF FINAL CONTROL is a credit test according to the curriculum.

12. SCHEME OF CALCULATION AND DISTRIBUTION OF POINTS RECEIVED BY STUDENTS:

For disciplines whose form of final control is credit:

The maximum number of grades for the student's current educational activity, during the term for the discipline that can be accepted, is equal to 200 grades.

The minimal number of grades for the student's current educational activity, during the term for the discipline that can be accepted, is equal to 120 grades.

$$x = \frac{CA \times 200}{5}$$

The calculation of grades number is done based on the marks received by a student (on the traditional scale) while his/her studying of the discipline, per arithmetic, means (AM), rounded off to two designations after coma. The resulting value is converted into grades according to the multigrade scale, ending with the credit test.

For the convenience, recalculation (conversion) of the average mark for current activity into a multigrade scale (200-grade) on discipline is provided:

Recalculation of the average score for current activities on a multi-point scale for disciplines that end with a credit test

4-grade scale	200-grade scale
5	200
4.97	199
4.95	198
4.92	197
4.9	196
4.87	195
4.85	194
4.82	193
4.8	192
4.77	191
4.75	190
4.72	189
4.7	188
4.67	187
4.65	186
4.62	185
4.6	184
4.57	183
4.52	181
4.5	180
4.47	179

4-grade scale	200-grade scale
4.45	178
4.42	177
4.4	176
4.37	175
4.35	174
4.32	173
4.3	172
4.27	171
4.24	170
4.22	169
4.19	168
4.17	167
4.14	166
4.12	165
4.09	164
4.07	163
4.04	162
4.02	161
3.99	160
3.97	159
3.94	158

4-grade scale	200-grade scale
3.92	157
3.89	156
3.87	155
3.84	154
3.82	153
3.79	152
3.77	151
3.74	150
3.72	149
3.7	148
3.67	147
3.65	146
3.62	145
3.57	143
3.55	142
3.52	141
3.5	140
3.47	139
3.45	138
3.42	137
3.4	136

4-grade scale	200-grade scale
3.37	135
3.35	134
3.32	133
3.3	132
3.27	131
3.25	130
3.22	129
3.2	128
3.17	127
3.15	126
3.12	125
3.1	124
3.07	123
3.02	121
3	120
<3	Insufficient

Students' self-independent work is assessed during the current control of the topic in the relevant lesson. Assimilation of topics that are submitted only for self-independent work is controlled during the final control.

The grade for the discipline, which ends with a differentiated test, is defined as the sum of points for current educational activities (not less than 72) and points for individual test tasks in the last lesson (not less than 50).

Scores in the discipline are independently converted into both the ECTS scale and the 4-point (national) scale. ECTS scores are not converted to a 4-point scale and vice versa.

The scores of students studying in one specialty, taking into account the number of scores earned in the discipline are ranked on the ECTS scale as follows:

ECTS scale	Statistical indicator
A	The best 10 % of students
B	The next 25 % of students
C	The next 30 % of students
D	The next 25 % of students
E	The last 10 % of students

Ranking with assignments of grades "A", "B", "C", "D", and "E" is conducted for students of this course who study in one specialty and have completed the discipline. Students who receive grades FX, F ("2") are not included in the list of students ranked. Students with an FX grade automatically receive an "E" score after retaking.

Discipline scores for students who have completed the program are converted into a traditional 4-point scale according to the absolute criteria listed below:

Grades for the discipline	Mark after the 4-grade scale
From 170 to 200 grades	5
from 140 to 169 grades	4
from 139 to 120 (the minimum number of grades, that a student must receive)	3
Below is the minimum number of grades, that a student must receive	2

The ECTS grades are not converted into the traditional scale, because the ECTS scale and the 4-grade scale are independent.

The objectivity of the evaluation of the students' educational activity is checked by statistical methods (correlation coefficient between the ECTS mark and the traditional mark).

13. THE METHODOLOGICAL SUPPORT

- The theoretical questions to themes of practical classes
- The theoretical questions for the final control
- The tasks for current knowledge control
- The tasks for final knowledge control
- The list of tasks for self-independent study
- The methodological guides/instructions for the practical classes
- The methodological guides/instructions for the self-independent study

14. REFERENCES

Basic

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2. The public health: textbook for students of higher educational establishments. Vinnytsia: «New book/Nova Knyha », pub. 3. 2013. 560 p.

3. Workshop for preparation for practical classes in the academic discipline "Public Health". Lviv, 2020.

4. Jekel's Epidemiology, Biostatistics, Preventive Medicine, and Public Health: With Student Consult. Joann G. Elmore, Dorothea Wild, Heidi D. Nelson, David L. Katz. Elsevier; 5th edition. 2020. 464 p.

5. Oxford Textbook of Global Public Health, 6 edition. / Edited by Roges Detels, Martin Gulliford, Quarraisha Abdool Karim and Chorh Chuan Tan. Oxford University Press, 2018. 1728 p.

Additional

1. Brigitte Baldi, David S. Moore Practice of Statistics in the Life Sciences Fourth Edition. W. H. Freeman; Fourth edition. 2018. 768 p.

2. Board Review in Preventive Medicine and Public Health. Gregory Schwaid. Elsevier, 2017. 450 p.

3. Liam J. Donaldson, Paul Rutter. Donaldson's Essential Public Health, Fourth Edition. CRC Press, Taylor&Francis Group, 2017. 374 p.

15. INFORMATION RESOURCES

The Legislation of Ukraine. The electronic resource: zakon.rada.gov.ua/

The medical legislation of Ukraine. The electronic resource: <http://mozdocs.kiev.ua/>

The statistical data of Ukraine. The electronic resource: <http://www.ukrstat.gov.ua/>

The statistical data of the Lviv region. The electronic resource: <https://www.lv.ukrstat.gov.ua/>

The center of public health WHC of Ukraine (Ministry of Health of Ukraine): <https://phc.org.ua/>

The Ukrainian database of medico-statistical information «Health for all»: <http://med-stat.gov.ua/ukr/news.html?id=203>

The World Health Organization www.who.int

The European Regional Bureau of WHO www.euro.who.int/ru/home

The Kokhranivsky centre of evidence-based medicine www.cebm.net

The Kokhranivsky library www.cochrane.org

The National medical library of the USA – MEDLINE PubMed www.ncbi.nlm.nih.gov/PubMed

The Canadian evidence-based centre of public care www.cche.net

The Centre of control and disease prevention www.cdc.gov

The Journal British Medical Journal www.bmj.com

The Journal Evidence-Based Medicine www.evidence-basedmedicine.com