

I. General information	
Name of faculty	Medical faculty № 1
Educational programme (branch, specialty, level of high education, form of education)	22 Health care Specialty 222 "Medicine" second (master's) level of higher education, full-time
Academic year	2023-2024
Name of the discipline, code (e-mail on the Danylo Halytsky LNMU web-site)	Radiation medicine, OK 24.2 kaf_radiology@meduniv.lviv.ua
Department (name, address, phone number, e-mail)	Radiology and radiation medicine Communal Noncommercial Enterprise of Lviv Regional Council "Lviv Regional Clinical Hospital" 79010, Lviv, Nekrasova str., 4, phone: (032) 276-78-06 e-mail: kaf_radiology@meduniv.lviv.ua Municipal Non-Commercial Enterprise of Lviv Regional Council "Western Ukrainian Specialized Children's Medical Center" 79035, Lviv, Dnisterska st., 27 phone: (032) 270-22-07, fax: +38(032)2702679 e-mail: zusdmc@ukr.net
Head of the department (e-mail)	Igor DATS – PhD, associate professor, datsigor57@gmail.com
Year of study (year when realizing of disciplines` study takes place)	5 year
Semester	IX / X
Type of discipline	Obligatory
Teachers (names, surnames, scientific degrees and titles of teachers who teach the discipline, contact e-mail)	Yulian MYTSYK - doctor of medical sciences, professor, mytsyk.yulian@i.ua Bohdana VERVEHA – doctor of medical sciences, associate professor, danaverveha@gmail.com
Erasmus yes/no (availability of discipline for students in programme Erasmus)	No
The person responsible for the syllabus (person to whom comments regarding the syllabus should be provided, contact e-mail)	Bohdana VERVEHA – doctor of medical sciences, associate professor, danaverveha@gmail.com
Amount of credits ECTS	1,0
Amount of hours (lectures/practical classes/independent work of students)	Number of hours: total - 30 lectures - 4 practical classes - 11 independent work of students - 15
Language of studying	English
Information about consultations	According to the schedule

Address, phone number, and hours of operation of the clinical department	Communal Noncommercial Enterprise of Lviv Regional Council “Lviv Regional Clinical Hospital” 79010, Lviv, Chernihivska st., 7 (24/7); phone: (032) 275-50-20, (032) 278-62-10 (around the clock) Municipal Non-Commercial Enterprise of Lviv Regional Council “Western Ukrainian Specialized Children's Medical Center”; 79035, Lviv, Dnisterska st., 27 phone: (032) 270-22-07 (around the clock)
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2. Brief anotation to the discipline

Radiation medicine is one of the fundamental natural sciences in the system of higher medical education, the knowledge of which is necessary for the high-quality training of specialists in the field of health care. The constant expansion of the sphere of human contact with sources of ionizing radiation, the possibility of emergency situations, accompanied by excessive exposure of professionals and the population, made it urgent to study the effect of this factor on human health. Analysis of the consequences of the accident at the Chernobyl nuclear power plant revealed a number of deficiencies in the knowledge of doctors, which led to errors in the provision of medical care and prevention to victims of the nuclear disaster.

In recent decades, radiation medicine has been replenished with new approaches in the diagnosis and treatment of radiation pathology. In this regard, the standards of higher medical education require a graduate of a higher medical educational institution to be able to carry out diagnostic and treatment measures in a timely manner and in sufficient quantity in case of accidental human exposure. Higher medical education also requires that a clinician should be able to predict the course of the acute period of radiation damage, as well as assess the risk of various remote consequences of radiation exposure.

Knowledge of radiation medicine allows the future specialist to understand the processes that occur in the human body under the influence of ionizing radiation.

Types of educational activities of students according to the curriculum are lectures, practical classes and independent work.

Systematic assessment of academic performance and enrollment of individual components of the discipline includes the following elements: current academic performance, independent work and semester credit. Current educational activity of students is monitored in practical classes. The following methods of checking the level of students' training are used: oral survey, situational tasks, written tasks. During the evaluation of the mastery of each topic for the current educational activity, the student is given grades on a four-point scale. A student must receive a grade for each class.

Independent work of students is evaluated during the current control of the topic in the corresponding lesson. The learning of topics that are assigned only to independent extracurricular work is monitored during the final examination.

Semester assessment is a form of final control, which consists in assessing the student's learning of the educational material based solely on the results of his performance of certain types of work in practical classes. Semester assessment of subjects is carried out after the end of its study, before the beginning of the examination session.

3. Purpose and tasks of discipline

1. The purpose of teaching the academic discipline "Radiation Medicine" is to form students' complex of knowledge, abilities and skills in radiation medicine.

2. The main tasks of studying the discipline "Radiation Medicine": According to the requirements of the educational and professional program, students must:

To know:

1. the nature and properties of ionizing radiation (alpha, beta, gamma, neutrons, X-ray);
2. the dosimetry of ionizing radiation;
3. the biological effect of ionizing radiation;
4. the etiology, pathogenesis, clinic and pathomorphology of radiation lesions;
5. diagnostic methods in radiation medicine;
6. the clinical course of acute and chronic radiation lesions;
7. the principles of radiation damage treatment;
8. radiotoxicology I ¹³¹, Cs ¹³⁷, Sg ⁹⁰, Ry ²³⁹;
9. the diagnosis, clinic and principles of treatment with the incorporation of radionuclides;
10. the impact of ionizing radiation on various organs and body systems;
11. the delayed effects of ionizing radiation;
12. the effect of small doses of ionizing radiation on the human body;
13. the principles of radiation damage prevention and their consequences;
14. the medical, psychological and social aspects of large-scale accidents at nuclear plants;
15. the principles of dispensation of persons who have been excessively exposed to ionizing radiation;
16. the national register of Ukraine of persons who suffered as a result of the Chernobyl disaster.

To be able:

1. to choose adequate diagnostic methods for determining radiation damage to various organs and body systems;
2. to conduct ionizing radiation dosimetry;
3. to diagnose radiation damage (degree of severity, period of clinical course, etc.) on the basis of dosimetry data, laboratory test results, and clinical signs;
4. to choose the necessary medical means for the treatment of victims of external irradiation or internal intake of radionuclides;
5. provide emergency aid to victims of ionizing radiation;
6. to sort the victims according to the severity of the injury, choose the means and place of evacuation;
7. to prevent radiation damage;
8. to diagnose acute and chronic radiation damage;
9. to carry out sanitary and educational work with the population, based on knowledge of the impact factors that arise during accidents at nuclear plants;
10. to carry out dispensation of persons who have been excessively exposed to ionizing radiation;
11. to use the national register of Ukraine of persons who suffered as a result of the Chernobyl disaster.

3. Competencies and learning outcomes, the formation of which is facilitated by the discipline (general competencies and special competencies).

– integral competence

The ability to solve complex problems, including those of a research and innovation nature in the field of medicine.

The ability to continue learning with a high degree of autonomy.

According to the requirements of the Higher Education Standard, the discipline ensures that students acquire the following **competencies**:

- general competencies (GC):

- GC1.** Ability to abstract thinking, analysis and synthesis;
- GC2.** Ability to learn and master modern knowledge;
- 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
- GC12.** Determination and persistence in relation to assigned tasks and assumed responsibilities;
- GC13.** Awareness of equal opportunities and tender issues;
- C14.** The ability to realize one's 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, the rights and freedoms of a person and a citizen in Ukraine;
- GC15.** The 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 and society and in the development of society, technology and technology, use different types and forms of motor activities for active recreation and leading a healthy lifestyle.

- special (professional, subject) competencies (PC):

- PC1.** Ability to collect medical information about the patient and analyze clinical data;
- PC2.** Ability to determine the necessary list of laboratory and instrumental studies and evaluate their results;
- PC3.** Ability to establish a preliminary and clinical diagnosis of the disease;
- PC4.** Ability to determine the necessary regime of work and rest in the treatment and prevention of diseases;
- PC5.** Ability to determine the nature of nutrition in the treatment and prevention of diseases;
- PC6.** Ability to determine the principles and nature of treatment and prevention of diseases;
- PC7.** Ability to diagnose emergency conditions;
- PC8.** Ability to determine the tactics of providing emergency medical care;
- PC9.** Ability to conduct medical evacuation measures;
- PC10.** Ability to perform medical manipulations;
- PC11.** Ability to solve medical problems in new or unfamiliar environments in the presence of incomplete or limited information, taking into account aspects of social and ethical responsibility;
- PC15.** Ability to conduct an examination of working capacity;
- PC16.** Ability to maintain medical documentation, including electronic forms;
- PC17.** Ability to assess the impact of the environment, socio-economic and biological determinants on the state of health of an individual, family, population;
- PC20.** Ability to conduct epidemiological and medical-statistical research on the health of the population; processing of social, economic and medical information;
- PC21.** It is clear and unambiguous to convey one's own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists, in particular to persons who are studying;
- PC24.** Adherence to ethical principles when working with patients and laboratory animals;
- PC25.** Adherence to professional and academic integrity, to be responsible for the reliability of the obtained scientific results.

Detailing of competencies in accordance with the NQF descriptors in the form of the "Competence Matrix".

4. Prerequisites of discipline

The study of the discipline "Radiation Medicine" is provided for in the 5th year in the 9th/10th semesters, when the student has acquired relevant knowledge of the main basic disciplines with which the program of the educational discipline is integrated.

For successful learning and mastering of competencies in this discipline, it is advisable to acquire knowledge in such disciplines as: medical biology, parasitology and genetics, medical physics, biological chemistry, bioorganic chemistry, bioinorganic and physicolloid chemistry, human anatomy, normal physiology, pathological anatomy, pathological physiology, which students receive in parallel with studying radiology. It lays the foundations for the study of propaedeutics of internal diseases with patient care, general surgery with anesthesiology and patient care, propaedeutics of pediatrics with child care, which involves the integration of teaching with these disciplines and the formation of skills to apply knowledge of radiation medicine in the process of further education and in professional activity.

5. Programme learning outcomes

List of learning outcomes

Results of study	Code of programmatic result of study	Code of competencies
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.	PRS 1	GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, GC10, GC11, GC12, GC13, GC14, GC15.
Understanding and knowledge of basic and clinical biomedical sciences, at a level sufficient for solving professional tasks in the field of health care.	PRS 2	GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, GC10, GC11, GC12, GC13, GC14, GC15.
Specialized conceptual knowledge that includes scientific achievements in the field of health care and is the basis for conducting research, critical understanding of problems in the field of medicine and related interdisciplinary problems.	PRS 3	GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, GC10, GC11, GC12, GC13, GC14, GC15.
To isolate and identify the leading clinical symptoms and syndromes according to standard methods, using the previous data of the patient's history, the data of the patient's examination, knowledge about the person, his organs and systems, to establish a preliminary clinical diagnosis of the disease.	PRS 4	GC1, GC2, GC3, GC6, GC7, GC8; PC1, PC2, PC3, PC24, PC25
To collect complaints, anamnesis of life and diseases, evaluate the psychomotor and physical development of the patient, the state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluate information about the diagnosis, taking into account the age of the patient.	PRS 5	GC1, GC, GC3, GC6, GC, GC8; PC1, PC2, PC24, PC25
To establish the final clinical diagnosis by making a reasoned decision and analyzing the received subjective and objective data of clinical, additional examination, differential diagnosis, observing the relevant ethical and legal norms, under the control of the head physician in the conditions of the health care institution.	PRS 6	GC1, 3K2, 3K3, 3K6, 3K7, 3K8; PC1, PC2, PC3, PC24.

<p>To assign and analyze additional (mandatory and optional) examination methods (laboratory, functional and/or instrumental) of patients with diseases of organs and body systems for differential diagnosis of diseases.</p>	<p>PRS7</p>	<p>GC1, GC2, GC3, GC4, GC6, PC2.</p>
<p>To determine the main clinical syndrome or what causes the severity of the victim/victim's condition (according to list 3) by making a reasoned decision and assessing the person's condition under any circumstances (in the conditions of a health care facility, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.</p>	<p>PRS8</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC1,PC3, PC7, PC8, PC9, PC10, PC11.</p>
<p>To determine the nature and principles of treatment (conservative, operative) of patients with diseases (according to list 2), taking into account the age of the patient, in the conditions of the health care institution, outside its borders and at the stages of medical evacuation, including in field conditions, on the basis of a preliminary clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes, in case of the need to expand the standard scheme, be able to justify personalized recommendations under the control of the head physician in the conditions of a medical institution.</p>	<p>PRS9</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC1,PC3, PC6, PC7, PC8, PC9, PC10, PC11.</p>
<p>To determine the necessary mode of work, rest and nutrition on the basis of the final clinical diagnosis, observing the relevant ethical and legal norms, by making a reasoned decision according to existing algorithms and standard schemes.</p>	<p>PRS 10</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC1,PC3, PC4, PC6, PC7, PC8, PC9, PC10, PC11, PC24.</p>
<p>To determine tactics and provide emergency medical care in emergency situations (according to list 3) in limited time conditions according to existing clinical protocols and standards of treatment.</p>	<p>PRS 14</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC7, PC8, PC9, PC10.</p>
<p>To organize the provision of medical aid and medical evacuation measures to the population and military personnel in emergency situations and hostilities, including in field conditions.</p>	<p>PRS 15</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC6-PC10.</p>
<p>To form rational medical routes for patients; organize interaction with colleagues in their own and other institutions, organizations and institutions; to apply tools for the promotion of medical services in the market, based on the analysis of the needs of the population, in the conditions of the functioning of the health care institution, its division, in a competitive environment.</p>	<p>PRS 16</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, PC6, PC7, PC8, PC9, PC11, PC17.</p>
<p>To perform medical manipulations (according to list 5) in the conditions of a medical institution, at home or at work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.</p>	<p>PRS 17</p>	<p>GC1, GC2, GC3, GC4, GC5, GC6, PC10, PC24.</p>

To determine the state of functioning and limitations of a person's vital activities and the duration of incapacity for work with the preparation of relevant documents, in the conditions of a health care institution, based on data about the disease and its course, peculiarities of a person's professional activity, etc. Maintain medical documentation regarding the patient and the contingent of the population on the basis of regulatory documents.	PRS 18	GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8,; PC11,PC15,PC16, PC25.
To search for the necessary information in the professional literature and databases of other sources, analyze, evaluate and apply this information.	PRS 21	GC1, GC2, GC3, GC4, GC6, C10;GC11,GC12; PC21, PC25.
To apply modern digital technologies, specialized software, and statistical data analysis methods to solve complex healthcare problems.	PRS 22	GC1, GC2, GC3, GC4, GC5, GC6,GC10; PC21, PC25.
To assess the impact of the environment on human health in order to assess the morbidity of the population.	PRS 23	GC1, GC2, GC3, GC4, GC5, GC6,GC10; PC17, PC21, PC25.
To organize the necessary level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.	PRS 24	GC1, GC2, GC3, GC4, GC5, GC6, GC10,GC12;
It is clear and unambiguous to convey one's own knowledge, conclusions and arguments on health care problems and related issues to specialists and non-specialists.	PRS 25	GC1, GC2, GC3, GC4, GC5, GC6; PC21.
To communicate freely in the national and English languages, both orally and in writing to discuss professional activities, research and projects.	PRS 27	GC1, GC2, GC3, GC5, GC6, GC11, GC12. PC21, PC25.

6. Format and scope of the discipline

Format of discipline	Full-time	
Type of class	Amount of hours	Amount of groups
Lectures	4	
Practical classes	11	
Independent work	15	

7. Topics and content of discipline

Occupation type code	Topic	Content of studying	Code of learning outcome	Teacher
L - 1	The subject of Radiation medicine and its correlation with other medical disciplines. The history of the development of Radiation medicine. Natural background radiation. Artificial sources of ionizing radiation. Biological action of ionizing radiation. Radiosensitivity of different tissues and organs.	To acquire basic knowledge about the subject of Radiation medicine, natural background radiation, artificial sources of ionizing radiation, biological effect of ionizing radiation, radiosensitivity of different tissues and organs.	K – 1-3, 7 A – 1, 15 C – 2, 4	Ass. Prof. Verveha B.M.

L - 2	Types of radiation injuries. Acute radiation syndrome. Acute local radiation injuries. Toxicology of the main radionuclides. Peculiarities of diagnostics, clinical symptoms in case of incorporation of radionuclides.	To acquire basic knowledge about types of radiation damage, acute radiation sickness, acute local radiation damage, toxicology of the main radionuclides. Features of diagnostics and clinics when radionuclides enter the human body.	K - 4, 6, 7, 8 A - 2, 3, 5 C - 1, 2, 3	Ass. Prof. Verveha B.M.
P - 1	Nature, types and properties of radiation. Dosimetry of ionizing radiation. The principle of construction of dosimeters, radiometers, their types.	To acquire basic knowledge about the nature, types and properties of radiation, dosimetry of ionizing radiation, the structure of dosimeters, radiometers, and their types.	K - 1, 2 A - 1, 15 C - 2, 3	Ass. Prof. Verveha B.M.
P - 2	Assessment of the degree of radionuclide contamination of the environment, soil, water, and food products. Incorporation of radionuclides.	To acquire basic knowledge about radionuclide contamination of the environment, soil, water, food products, incorporation of radionuclides.	K - 5, 7 A - 2, 3 C - 3	Ass. Prof. Verveha B.M.
P - 3	Acute radiation sickness. Etiology, pathogenesis, clinical manifestations, diagnosis, treatment, consequences, medical and social examination.	To acquire basic knowledge about etiology, pathogenesis, clinical manifestations, diagnosis, treatment, consequences of acute radiation sickness, issues of medical and social examination.	K - 6 A - 1, 2 C - 3, 4	Ass. Prof. Verveha B.M.
P - 4	Acute local radiation injuries. Etiology, pathogenesis, clinical manifestations, diagnosis, treatment, consequences, medical and social examination.	To acquire basic knowledge about etiology, pathogenesis, clinical manifestations, diagnosis, treatment, consequences of acute radiation sickness, issues of medical and social examination.	K - 4, 6, 13, 14 A - 2 C - 3, 4, 11	Ass. Prof. Verveha B.M.

P – 5	Delayed effects of ionizing radiation. Stochastic and non-stochastic effects of radiation.	To acquire basic knowledge about the delayed effects of ionizing radiation (stochastic and non-stochastic effects of radiation).	K – 8, 10, 11 A – 8 C – 11	Ass. Prof. Verveha B.M.
P – 6	The effect of low dose of ionizing radiation on the human body.	Master the basic knowledge about effect of low dose of ionizing radiation on the human body.	K – 8, 10, 11 A – 8 C – 11	Ass. Prof. Verveha B.M.
IWS- 1	Artificial sources of ionizing radiation and their use in the national economy. Closed and open sources of ionizing radiation.	To acquire knowledge about artificial sources of ionizing radiation and their use in the national economy, closed and open sources of ionizing radiation	K – 2, 5, 7 A – 1 C – 2, 3, 4	Ass. Prof. Verveha B.M.
IWS – 2	The concept of the risk of effect of ionizing radiation on the human body. The effect of ionizing radiation on different organs and body systems. Radiation syndromes.	To acquire basic knowledge about the impact of ionizing radiation on the human body, radiation syndromes.	K – 9, 10 A – 1, 2, 10 C – 2, 3, 4	Ass. Prof. Verveha B.M.
IWS – 3	Somatic, teratogenic and genetic effects of radiation exposure. Chronic radiation sickness. Etiology, pathogenesis, diagnosis, clinic, treatment.	To acquire basic knowledge about somatic, teratogenic and genetic consequences of radiation exposure, chronic radiation sickness.	K – 9, 10 A – 1, 2, 10 C – 2, 3, 4	Ass. Prof. Verveha B.M.
IWS– 4	Chronic radiation sickness. Etiology, pathogenesis, clinic, diagnosis, treatment.	To acquire basic knowledge about etiology, pathogenesis, clinical manifestations, diagnosis, treatment, consequences of chronic radiation sickness, issues of medical and social examination.	K– 6, 10, 13 A – 3, 4, 5, 7, 8 C – 2-4, 13	Ass. Prof. Verveha B.M.

IWS – 5	Medical, social, ecological and psychological aspects of large-scale accidents at nuclear plants (modeled on the Chernobyl NPP accident). The problem of bone marrow transplantation in acute radiation sickness.	To learn the medical, social, ecological and psychological aspects of large-scale accidents at nuclear plants (according to the model of the accident at the Chernobyl NPP). Master the basic knowledge of bone marrow transplantation in acute radiation sickness.	K – 4, 5, 10, 12 A – 2, 7, 8 C – 1-4	Ass. Prof. Verveha B.M.
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- 1) Sets of tasks for test control of knowledge
- 2) Situational tasks.
- 3) Oral survey and discussion of the topic.
- 4) Multimedia presentations.
- 5) Video materials.

8. Verification of training results

Current control

Learning outcome code	Class type code	Method of verification of learning results	Enrollment criteria
K – 1-16 A – 1-11 C – 1-14	L – 1-2 P – 1-6 IWS – 1-5	<p>Types of educational activities of students according to the curriculum are:</p> <p>a) lectures; b) practical classes; c) independent work of students (IWS)</p> <p>The lecture course consists of 3 lectures. The topics of the lecture course reveal the problematic issues of the relevant sections of radiation medicine. During the lectures, students develop basic theoretical knowledge, provide a motivational component and a generally oriented stage of mastering scientific knowledge during students' independent work. In the lecture course, various didactic tools are used as much as possible.</p> <p>Lectures are the presentation of material necessary for the student to understand the subject while preparing for practical classes. Practical classes are clinical, aimed at monitoring the assimilation of theoretical material and the formation of practical skills and abilities, as well as the ability to</p>	<p>Assessment of knowledge:</p> <p>Excellent ("5") - The student correctly answered 90-100% of tests of format A. Correctly, clearly and logically and completely answers all standardized questions of the current topic, including questions of the lecture course and independent work. Closely connects theory with practice and correctly demonstrates performance (knowledge) of practical skills. Solves situational tasks of increased complexity, knows how to summarize the material. Completed planned individual work.</p> <p>Good ("4") - The student correctly answered 70-89% of tests of format A. Correctly and essentially answers the standardized questions of the current topic, lecture course and independent work. Demonstrates performance (knowledge) of practical skills. Correctly uses theoretical knowledge when</p>

		<p>analyze and apply the acquired knowledge to solve situational tasks, held on the clinical bases of the department.</p> <p>Each lesson begins with a test control in order to assess the initial level of knowledge and determine the degree of readiness of students for the lesson.</p> <p>The next stage of the lesson is the student's practical work in the lesson. Control is carried out by assessing the student's performance of practical skills, the ability to solve typical situational tasks.</p> <p>At the final stage for assessment of the student's mastery of the topic, he is asked to answer situational problems.</p> <p>The duration of one practical lesson of the topic and taking into account the norms of the weekly classroom load is 2.0 academic hours.</p>	<p>solving practical tasks. Able to solve situational tasks of easy and medium complexity.</p> <p>Possesses the necessary practical skills and methods of their implementation in an amount that exceeds the required minimum.</p> <p>Satisfactory ("3") - The student correctly answered 50-69% of tests of format A. Incompletely, with the help of additional questions, answers standardized questions of the current topic, lecture course and independent work. The student cannot independently construct a clear, logical answer. During the answer and demonstration of practical skills, the student makes mistakes. The student solves only the easiest tasks.</p> <p>Unsatisfactory ("2") - The student answered less than 50% of the tests of form A. The student does not know the material of the current topic, cannot construct a logical answer, does not answer additional questions, does not understand the content of the material. During the answer and demonstration of practical skills, he makes significant, gross mistakes.</p>
		Final control	
General system of assesment	Participation in work during the semester/semester credit - 60%/40% on a 200-point scale		
Scales of assesment	traditional 4-point scale, multi-point (200-point) scale, ECTS rating scale		
Conditions of admission to the final control	The student attended all practical classes and received at least 120 points for the current performance		
Type of final control	Методика проведення підсумкового контролю	Enrollment criteria	
Semester assessment	All topics submitted for current control must be included. Grades from a 4-point scale are converted into points on a multi-point (200-point) scale in accordance with the Regulation "Criteria, rules and procedures for evaluating the results of students' educational activities"		The maximum number of points is 200. The minimum number of points is 120.

Evaluation criteria for the semester credit

Semester credit

The form of the final control is standardized, includes the control of theoretical and practical training and is conducted at the last lesson based on the results of the training.

Current control is carried out during training sessions and is aimed at checking students' assimilation of educational material.

At each practical session, the student's knowledge is evaluated according to the four-point system "5".

Control of solving situational tasks is carried out during practical class by assessing the quality and completeness of their implementation, the ability to interpret the obtained results. For the practical part of the lesson, the student can gain:

4 points if the work is completed in full and the student freely and correctly explains the situational task and gives an assessment;

2 points if the work is completed with some errors, the student cannot fully explain the situational task and give an assessment;

0 points if the work is not completed or the student cannot explain the situational task and give an assessment.

The final grade for the class is determined by the sum of the results of the test control and the performance of practical work as follows:

Sum of points
Score out of 4 point scale
from 22 to 26 points - 5
from 17 to 21 points - 4
from 11 to 16 points - 3
< 9 points for the test control or
0 points for practical part - 2

The grade in the discipline, which ends with a semester credit, is determined as the sum of points for the current educational activity (at least 120 points).

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

From 170 to 200 points -

excellent;

From 140 to 169 points is

good;

From 139 points to the minimum number of points that the student must score -

satisfactory;

Below the minimum number of points that a student must score (<50) is

unsatisfactory.

	<p>Forms of assessment of current educational activities are standardized and include control of theoretical and practical training.</p> <p>The maximum number of points that a student can score for the current educational activity in the discipline is 200 points.</p> <p>The minimum number of points that a student must score for the current educational activity in the discipline is 120 points.</p>	
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The calculation of the number of points is carried out on the basis of the grades received by the student on a 4-point (national) scale during the study of the discipline, by calculating the arithmetic mean (CA), rounded to two decimal places. The obtained value is converted into points on a multi-point scale as follows:

$$X = \frac{AM \times 200}{5}$$

9. Politics of discipline

The policy of the academic discipline is determined by the system of requirements for the student when studying the discipline "Radiation Medicine" and is based on the principles of academic integrity.

Students are explained the value of acquiring new knowledge, academic norms that must be followed, why they are important, what academic integrity is, what its values and functions are, how students can contribute to its development by their actions; the essence, peculiarities and reasons for the inadmissibility of academic plagiarism are explained, students of higher education are encouraged to independently complete educational tasks, correctly refer to sources of information in case of borrowing ideas, statements, and information.

The policy of the academic discipline is:

in mandatory observance of academic integrity by students, namely:

- independent performance of all types of jobs, tasks, forms of control provided for by the work schedule the program of this academic discipline;
- references to sources of information in the case of using ideas, developments, statements, information;
- compliance with the legislation on copyright and international rights;
- provision of reliable information about the results of one's own educational (scientific) activity, used research methods and sources of information.

compliance with the principles and norms of ethics and deontology by students of higher education:

- actions in professional and educational situations from the standpoint of academic integrity and professional ethics and deontology;
- compliance with the internal rules of the clinical base of the department, to be tolerant, friendly and balanced in communication with students and teachers, patients, medical personnel of health care institutions;
- awareness of the significance of examples of human behavior in accordance with academic standards integrity and medical ethics.

attendance of classes by students of higher education:

- attendance at all classes is mandatory for the purpose of current and final assessment knowledge (except for good reason).

revision of topics and practice of missed classes by students of higher education:

- missed classes are made up according to the schedule
- rewriting the topic of the lesson for which the student received a negative grade is held at convenient time for the teacher and the student outside of classes, the maximum grade is "good";
- rewriting the topic during ongoing training and final control for the purpose of promotion assessment is not allowed

10.Literature

Basic

1. Means of protection of the body against the action of ionizing radiation [Text]: training manual. for students higher education Institutions of the Ministry of Health of Ukraine/L. M. Vasko, V. F. Pocherniaeva, V. P. Bashtan. - K. : VSV "Medicine", 2019.-112 p.
2. Medicine of emergency situations [Text]: Textbook / B. D. Khalmuradov, P. B. Volyanskyi. - K. : Center for Educational Literature, 2018.-256 p.
3. Radiology. Radiation therapy. Radiation diagnostics [Text]: Textbook for students. higher medical studies institution. IV year of accreditation / O. V. Kovalskyi, D. S. Mechev, V. P. Danylevich. - 2nd ed. - Vinnytsia: Nova Kniga, 2017. - 512 p.
4. I.M. Hudkov. Radiobiology: Textbook for higher education. educational institutions. -K.: NUBiP of Ukraine, 2017.-485p.; table 50. Ill. 105. Bibliography: 30 titles.
5. Bebeshko V.G., Kovalenko O.M., Bily D.O. Acute radiation syndrome and its consequences. Ternopil: TDMU, 2016. - 424 p.
6. Chernobyl disaster. See ed. V.G. Baryakhtar. - K.: Science. dumka, 1995. - 575p.
7. Radio-biophysical and medical-hygienic consequences of the Chernobyl disaster: ways of understanding and overcoming. Practical guide for a family doctor / V.G. Bebeshko, B.S. Proster, M.I. Omelyanets - Uzhgorod: TDV "Patent", 2017. - 504 p.

Additional

1. Study of the frequency and doses of irradiation due to x-ray diagnostic procedures / A.V. Kutsak, A.I. Sevalnev, M.I. Kostenetskyi et al. Herald of problems of biology and medicine. 2017. Issue 2 (136). P. 70–74.
2. Research on the content of cesium137 and strontium90 in food products with an assessment of population exposure doses and possible negative health consequences. / A. V. Kutsak, A. I. Sevalnev, M. I. Kostenetsky and others. Herald of problems of biology and medicine. 2017. Issue 1(135). P. 75–78.
3. Kostenetskyi M. I., Sevalnev A. I., Kutsak A. V. Radioecology of the living environment of the population of the Zaporizhia region. Zaporizhzhia: ZDMU Publishing House, 2017. 151 p.
4. Atomic Radiation Is More Harmful to Women. <https://www.genderandraradiation.org/wp-content/uploads/2017/05/corrected-radiationwomenfnal.pdf>.
5. Fukushima Catastrophe at 6: Normalizing Radiation Exposure Demeans Women and Kids and Risks Their Health. <https://www.counterpunch.org/2017/03/06/ukushima-catastrophe-at-6-normalizing-radiation-expo-sure-demeans-women-and-kids-and-risks-thei>
6. 20 years of the Chernobyl disaster. A look into the future. National report of Ukraine. - K.: "Atika", 2006. - 224 p.
7. Standards of radiation safety of Ukraine. Supplement: Radiation protection from sources of potential exposure (NRSU-97/D-2000). Kyiv, 2000. - 80 p.

Information resources

When studying the discipline, due to the use of local and global computer networks, students use the following information resources and knowledge bases:

1. Ministry of Health - <http://www.moz.gov.ua/ua/portal/>
2. Wikipedia - <http://uk.wikipedia.org>
3. UpToDate - <http://www.uptodate.com/home>
4. Access Medicine - <http://accessmedicine.mhmedical.com>
5. PubMed - <https://www.ncbi.nlm.nih.gov/pmc/>

Electronic versions of educational and methodological support:

Methodological recommendations for practical classes and independent work on radiation

medicine for students of the 5th year of the Faculty of Medicine in the specialty: 222 - "Medicine", field of knowledge 22 "Health Care" are posted on the MISA distance learning service and are freely available to students.

Access method: <http://misa.meduniv.lviv.ua/course/index.php?categoryid=635>

11. Equipment, logistical and software support of the discipline

Methodological support of the lecture course:

1. Abstracts of lectures.
2. Methodical recommendations for lectures.
3. Lecture presentations.
4. Educational video materials on the topic of the lecture.

Methodical provision of practical classes:

1. Methodical recommendations for practical classes for teachers.

2. Methodical recommendations for practical classes for students.
3. Variants of test tasks to check the initial level of knowledge on each topic.
4. Variants of situational tasks to check mastery of topics.
5. Variants of tasks (theoretical and practical) for final control.

Material and technical support:

1. Multimedia projector.

12. Additional information

Department page

https://new.meduniv.lviv.ua/uploads/repository/kaf/kaf_radiology/03.%D0%A1%D0%B8%D0%BB%D0%B0%D0%B1%D1%83%D1%81%D0%B8/Sylabus_Radiologiya_3_medychnyj.pdf

Complier of the syllabus:

Bohdana VERVEHA,

doctor of medical sciences, associate professor

(Signature)

Head of the Department

Igor DATS, PhD, associate professor

(Signature)