FEDERAL STATE BUDGETARY
EDUCATIONAL INSTITUTION OF HIGHER EDUCATION
"AMUR STATE MEDICAL ACADEMY"
MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION

AGREED
Vice-Rector for Academic Affairs,

_____N.V. Loskutova

April17, 2025

Decision of the CCMC
April17, 2025

ProtocolNo. 7

APPROVED
by decision of the Academic Council of the FSBEI HE Amur SMA of the Ministry of Health of the Russian Federation
April 22, 2025

Protocol No. 15

Acting Rector of the FSBEI HEAmur SMA of the Ministry of Health of the Russian Federation

_____I.V. Zhukovets

April 22, 2025

ДОКУМЕНТ ПОДПИСАН
ЭЛЕКТРОННОЙ ПОДПИСЬЮ

Сертификат: 50AB2242604E64520B52614FA420034A
Владелец: Жуковец Ирина Валентиновна
Действителен: с 15.04.2025 до 09.07.2026

EDUCATIONAL PROGRAM

discipline "Radiation diagnostics"

Specialty: 31.05.01 General Medicine
Course: 3
Semester: 6
Total hours: 72 hrs.
Total credits: 2 credit units
Control form: credit-test, 6semester

Blagoveshchensk, 2025

The educational program of the discipline is designed in accordance with the requirements of the Federal State Educational Standard of Higher Education - specialist in specialty 31.05.01 General Medicine, approved by the order of the Ministry of Education and Science of Russia dated 08.12.2020 No. 988 (registered with the Ministry of Justice of Russia on 08.26.2020 No. 59493), BPEP HE (2021).

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Chief oncologist of the Ministry of Health of the Amur Region T.N.Korobkova

APPROVED at the meeting of the Department of Radiation Diagnostics, Radiation Therapy with a Course in Oncology,
Protocol No. 8 dated March 24, 2025

Head of the Department, Holder of an Advanced Doctorate in Medical Sciences, Professor _____ V.P. Gordienko

Conclusion of the Expert Commission on the review of the Educational Programs:
Protocol No. 2 dated April 10, 2025

Expert of the expert commission,
Head of the Department of Otolaryngology and Ophthalmology, Holder of the Advanced Doctorate in Medical Sciences,Professor _____ A.A. Blotskii

APPROVED at the meeting of the CMC No. 4:
Protocol No.2 dated April 15, 2025

Chairman of the CMC No.4
Head of the Department of Traumatology with a course in disaster medicine
Holder of the Advanced Doctorate in Medical Sciences,
Professor _____ I.V. Borozda
AGREED: Dean of the Faculty of Medicine,
Ph.D. ofMedical Sciences _____ N.G. Brush
April 17, 2025

CONTENTS

1. EXPLANATORY NOTE

1.1. Characteristics of the Discipline

Radiation diagnostics is a branch of modern medical practice, the content of which is the application of various radiations for the purpose of recognizing pathological changes in organs and tissues to study the morphology and function of normal and pathological human organs and systems. Radiation diagnostics includes: X-ray diagnostics, including computed tomography (CT), radionuclide diagnostics, magnetic resonance imaging (MRI), medical thermography, ultrasound diagnostics, and interventional radiology, which involves performing diagnostic and therapeutic procedures under the control of radiation methods.

A significant feature of the subject is the absence of an unambiguous interpretation of results obtained by various radiation methods, since each organism is unique, and a single norm does not exist for everyone. It is necessary to conduct studies using different radiation methods and compare the results of repeated examinations of one person, taking into account all the factors that can influence the functions being studied. This requires a sufficiently large amount of knowledge and skills.

The work program of the discipline "Radiation Diagnostics" is aimed at studying the radiation anatomy of the cardiovascular, respiratory and musculoskeletal systems, the gastrointestinal tract, performing various radiation diagnostic methods and studying the interpretation of the results obtained.

1.2. Aim and Objectives of the Discipline.

The **aim** of teaching the discipline: to form systemic theoretical knowledge and practical skills in students, logical thinking based on the natural science character of the material being studied, professional medical qualities, to teach students the basics of X-ray diagnostics, to introduce them to the fundamental capabilities of ultrasound, computed tomography, magnetic resonance imaging, radioisotope diagnostics, and to the rules of radiation safety for use in practical work.

Objectives of the discipline:

Objectives of the discipline – providing students with the necessary information to master knowledge in the field of radiation diagnostics: emergency conditions, diseases, and pathological conditions in children and adolescents based on the mastery of clinical and laboratory-instrumental research methods:

1. To form a holistic understanding among students of the formation of radiation symptoms and syndromes in pathological changes of organs from the point of view of objectivity and completeness of information obtained using various radiation diagnostic methods, taking into account the full scope of their use.
2. To form a stable motivation in students for an in-depth study of the radiation manifestations of various diseases, with the aim of further applying the acquired knowledge in the subsequent study of other clinical disciplines (therapeutics, surgery, pediatrics, oncology, orthopedics and traumatology, etc.), as well as in the real practical activity of a doctor.
3. As a result of mastering the discipline, students should acquire theoretical knowledge and practical skills in radiation diagnostics, differential diagnosis of diseases and injuries of internal organs and the musculoskeletal system.

1.3. Place of the discipline in the structure of the main professional educational program of higher education.

1. Students must understand the indications and contraindications, advantages and disadvantages of various radiation methods and techniques in clinical practice for the most frequently encountered pathological conditions.
2. Students must have an understanding of the organization of X-ray examinations in medical and preventive institutions, and also be familiar with the latest achievements and prospects for the development of radiation diagnostics.

In accordance with the Federal State Educational Standard of Higher Education – specialty 31.05.01 General Medicine (2020), the discipline "Radiation Diagnostics" belongs to the basic part, Block 1. The total workload is 2 credit units (72 hours), taught in the 6th semester of the 3rd year. Form of control – credit.

Main sections of the studied discipline:

1. Basic methods of radiation diagnostics
2. Radiation diagnostics of the musculoskeletal system
3. Radiation diagnostics of diseases of the chest organs and mediastinum
4. Radiation diagnostics of diseases of the gastrointestinal tract
5. Radiation diagnostics of diseases of the biliary and urinary systems

1.4. Requirements for students

For studying the discipline "Radiation Diagnostics", knowledge, skills and abilities formed by previous disciplines are required:

Latin Language

- Knowledge: basic medical and pharmaceutical terminology in Latin.
- Skills: ability to apply knowledge for communication and obtaining information from medical literature, medical documentation.
- Abilities: work with methodological and scientific literature considering the studied issues.

Human Anatomy

- Knowledge: Anatomical structure of human organs and systems.
- Skills: apply knowledge to study radiation images of human organs.
- Abilities: perform X-ray examination considering anatomical knowledge.

Histology, Embryology, Cytology

- Knowledge: histological structure of tissues, embryogenesis of human organs and systems. Structure, development of organs and systems.
- Skills: analyze the results of histophysiological research of human organs and systems.
- Abilities: work with methodological and scientific literature considering the studied issues.

Physics, Mathematics. Medical Informatics. Medical Biophysics

- Knowledge: types of electromagnetic and corpuscular radiation, ultrasound waves used in radiation diagnostics. Physical foundations of radiation diagnostic methods: X-ray, radionuclide, magnetic resonance, ultrasound. Technical foundations of radiation diagnostics.
- Skills: use educational, scientific, popular science literature, the Internet for professional activity, work with equipment considering safety rules.
- Abilities: work with a negatoscope and other electrical appliances.

Biology

- Knowledge: laws of genetics, their importance for medicine; patterns of heredity and variability in individual development as a basis for correct diagnosis, understanding of the pathogenesis and etiology of hereditary and multifactorial diseases (II-III level).
- Skills: analyze the role of heredity and variability in the development of diseases of human organs and systems.
- Abilities: work with methodological and scientific literature considering the studied issues.

Normal Physiology

- Knowledge: physiology of respiration, circulation, digestion, genitourinary system. Physiological foundations of musculoskeletal system activity.
- Skills: analyze the importance of regulating biological processes in the human body for the functioning of the cardiovascular, respiratory, and digestive systems.
- Abilities: independent work with documents presented on various medical information carriers.

Pathophysiology, Clinical Pathophysiology

- Knowledge: morphological changes in body tissues in pathology of cardiovascular, respiratory systems, gastrointestinal tract, biliary and urinary systems, and musculoskeletal system.

- Skills: determine the contribution of pathophysiological processes to the development of cardiological and pulmonological diseases.
- Abilities: interpret the results of human physiological constants research.

Professional Foreign Language

- Knowledge: basic medical and pharmaceutical terminology in a foreign language (II-III level).
- Skills: ability to apply knowledge for communication and obtaining information from foreign sources.
- Abilities: apply medical and pharmaceutical terminology in a foreign language in professional activity.

1.5. Interdisciplinary connections of the discipline with subsequent disciplines

For studying this academic discipline, knowledge, skills and abilities formed by previous disciplines are necessary:

- in the cycle of humanities and natural sciences, including: biology, Latin language, history of medicine, philosophy.
- in the cycle of mathematical and natural sciences, including: anatomy, histology, normal physiology, pathological anatomy, informatics, modern methods of medical visualization. - the discipline is prerequisite for studying disciplines: internal diseases, surgical diseases, pediatrics, urology, traumatology, phthisiopulmonology, oncology, infectious diseases.

Name of Subsequent Disciplines and Numbers of sections of this discipline necessary for studying subsequent disciplines

No.	Name of Subsequent Disciplines	Numbers of sections of this discipline necessary for studying subsequent disciplines				
		1	2	3	4	5
1	Therapy	+	+	+	+	+
2	Surgery	+	+	+	+	+
3	Oncology	+	+	+	+	+
4	Neurology and Neurosurgery			+	+	+

Name of Subsequent Disciplines and Numbers of sections of this discipline necessary for studying subsequent disciplines

No.	Name of Subsequent Disciplines	Numbers of sections of this discipline necessary for studying subsequent disciplines				
		1	2	3	4	5
5	Traumatology and Orthopedics	+	+	+	+	+
6	Phthisiology			+	+	+

1.6. Requirements for learning outcomes

The study of the discipline "Radiation Diagnostics" is aimed at the formation of the following competencies: universal (UC), general professional (GPC) and professional (PC): UC-1; GPC-1; PC-1, 2, 11.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	Be able to	Possess (Master)
Universal Competencies					
1	UC-1. Capable of performing critical analysis of problematic situations based on a systemic approach, developing a strategy for action.	UC ID-1.1. Analyzes a problematic situation as a system, identifying its components and connections between them. UC ID-1.2. Identifies gaps in information	Main historical stages of development of radiation diagnostics, subject and tasks of the discipline, connection with other medical and biological disciplines; basic concepts used in	Characterize the stages of development of radiation diagnostics as a science and its role at the current stage; assess the levels in modern stage of diagnostics of organs and human systems.	Ability to analyze the significance of various methods of radiation diagnostics at the current stage.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
		necessary for solving problematic situations and designs processes to eliminate them.	radiation diagnostics.		
General Professional Competencies					
2	GPC-1. Capable of implementing moral and legal norms, ethical and deontological principles in professional activity.	GPC ID-1.1. Carries out professional activity in accordance with ethical norms and moral-n-moral principles. GPC ID-1.2. Organizes professional activity, guided by legislation in the field of healthcare, knowledge of medical ethics and deontology. GPC ID-1.3. Has skills in presenting an	Ethical norms and moral-n-moral principles, questions of ethics and deontology, basic legislative articles in the healthcare field; principles of using information, bibliographic resources, information and communication technologies, taking into account the main requirements of information security, medico-biological terminology.	Use information, bibliographic resources, information and communication technologies, taking into account the main requirements of information security.	Methods of solving standard tasks of professional activity using information, bibliographic resources, medico-biological terminology, information and communication.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
		independent point of view, analysis and logical thinking, public speaking, moral and ethical argumentation, conducting discussions and round tables, principles of medical deontology and medical ethics.			

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
Professional Competencies					
3	PC-1. Ability to collect and analyze complaints, life history, and disease	PC ID-1.1. Collects complaints, disease history, and life history of a patient with a	Radiation anatomical-physiological age-sex and individual structural	Independently recognize images of all human organs and indicate their main anatomical	Medical-anatomical conceptual apparatus with various thematic terminology (in

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
	history of a patient to establish a diagnosis and/or condition according to the "therapy" profile.	disease and/or condition according to the "therapy" profile (or their legal representative). PC ID-1.2. Interprets and analyzes information obtained from a patient with a disease and/or condition according to the "therapy" profile (or their legal representative).	features of a healthy body, as well as changes in organs in various diseases; X-ray, ultrasound and other radiation symptoms of certain diseases, taking into account the stage of pathological process development, modern diagnostic methods, diagnostic capabilities of radiation research methods, patient examination techniques for basic X-ray methods; evaluation of research results, objective status of the patient, history collection	structures on X-rays, angiograms, CT and MRI, ultrasound with the identification of pathological symptoms; outline the scope of additional research in accordance with the prognosis of the disease, for clarifying the diagnosis and obtaining reliable results. Determine by radiation methods.	Russian, Latin and Greek languages); methods of general clinical examination (correctly assess and determine the degree of abnormalities according to radiation studies); skills in compiling protocols for radiation studies in norm and in pathology, as well as conclusions for individual clinical cases, taking into account the analysis of the obtained data, in accordance with international qualification based on the obtained scientific and medical information.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
			technique, analyze clinical and laboratory data for the purpose of conducting an X-ray examination. The amount of preliminary information for decision making; assess health status; make a preliminary diagnosis.		
4	PC-2. Ability to conduct a physical examination of the patient, analyze the results of additional examination methods to establish a diagnosis and/or condition according to the "therapy" profile.	PC ID-2.1. Conducts physical examination of the patient (inspection, palpation, percussion, auscultation) and interprets its results. PC ID-2.4. Interprets the results of laboratory and instrumental examinations of patients. PC ID-2.6. Interprets	Basics of organization and conduct of radiation screening methods (preclinical diagnostics) of socially significant diseases. Determine the volume and sequence of radiation studies; competently build an algorithm for	Document diagnostic information, describe the results of X-ray examination with protocol registration and conclusions; attribute the obtained data to a certain class of diseases; professionally draw up a medical conclusion; give recommendations to the attending	Modern methods of traditional X-ray, CT, MRI, ultrasound examination of human organs and systems, different age periods, use archival data.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
		conclusions obtained from specialist doctors.	patient radiation examination (determine indications and expediency of the study, choose adequate research methods and considering deontology problems when making decisions).	physician on further patient examination plan.	
5	PC-11. Ability to manage medical documentation and control its quality.	PC ID-11.1. Fills medical documentation, including in electronic form, controls the quality of its maintenance. PC ID-11.2. Uses personal patient data and information constituting medical secrecy in their work. PC ID-11.3. Uses medical information systems and the	Terminology of radiation diagnostic methods used to identify symptoms and syndromes of diseases and emergency conditions in clinical medicine.	Independently formulate protocols for X-rays and sonograms, using medical terminology and necessary algorithms.	Ability to use medical information and telecommunication systems in professional activity.

No.	Competency Code and Name of Competency	Name of Competence Achievement Indicator	As a result of studying the academic discipline, the student must:		
			Know	**Be able to**	**Possess (Master)**
		information and telecommunication network "Internet" in their professional activities.			

Modules of the discipline and code of formed competencies

No.	Section Name	Code of formed competencies
1.	Basic methods of radiation diagnostics	UC-1; GPC-1; PC-1; PC-2; PC-11.
2.	Radiation diagnostics of the musculoskeletal system	UC-1; GPC-1; PC-1; PC-2; PC-11.
3.	Radiation diagnostics of diseases of the chest organs and mediastinum	UC-1; GPC-1; PC-1; PC-2; PC-11.
4	Radiation diagnostics of diseases of the gastrointestinal tract	UC-1; GPC-1; PC-1; PC-2; PC-11.
5	Radiation diagnostics of diseases of the biliary and urinary systems	UC-1; GPC-1; PC-1; PC-2; PC-11.

1.7. Stages of competence formation and description of assessment scales

Competency Code

UC-1

GPC-1

PC-1

PC-2

PC-11

Stages of Competence Formation

Stage I
Mastery of theoretical knowledge

Stage II
Ability to apply knowledge in practice

Stage III
Proficiency in skills in a specific situation

Assessment Scale

According to the criteria for assessing learning outcomes:

Binary scale
"Credit" - mastered the competence
"No Credit" - did not master the competence

1.8 Forms of learning organization and types of control

Form of student learning organization	**Brief characteristic**
Lectures	Lecture material contains key and most problematic issues of the discipline, most significant in specialist training.
Practical classes	**Designed for analysis (consolidation) of theoretical provisions and control over their assimilation with subsequent application of the acquired knowledge during the study of the topic.**
Interactive forms of learning	• solving situational problems and exercises with subsequent discussion; • interactive survey; • performing creative tasks; • small group method; • discussions; • online course of the discipline in the Moodle system; • testing in the Moodle system.

Practical classes	**Designed for analysis (consolidation) of theoretical provisions and control over their assimilation with subsequent application of the acquired knowledge during the study of the topic.**
Participation in research work of the department, student club and conferences	• preparation of oral messages and poster presentations for speaking at a student club or scientific conference; • writing abstracts and essays on the chosen scientific direction; • preparation of a literature review using educational, scientific, reference literature and Internet sources.

Types of Control

Type of control	**Brief characteristic**
Entrance control	Checking theoretical knowledge and practical skills. Entrance knowledge control includes: • testing in the Moodle system (entrance knowledge control test), • solving clinical and situational problems and exercises. The results of entrance control are systematized, analyzed and used by the department's teaching staff to develop measures for improving and updating the methods of teaching the discipline.
Current control	Current knowledge control includes: • checking the solution of clinical and situational problems and exercises performed independently (extracurricular independent work); • assessment of theoretical material assimilation (oral questioning and computer testing); • control over the technique of performing experiments in practical classes and protocol registration; • testing in the Moodle system on all topics of the discipline (tests include theoretical and practical questions);

Type of control	Brief characteristic
	• individual assignments (practical and theoretical) for each studied topic of the discipline.
Intermediate certification	Intermediate certification is presented by a credit exam, which students take at the end of the cycle. The credit exam includes the following stages: • assessment of theoretical material knowledge (oral questioning and interview); • testing in the Moodle system (intermediate certification test); • checking the assimilation of practical skills and abilities; • solving clinical and situational problems and exercises for each studied topic of the discipline.

2. STRUCTURE AND CONTENT OF THE DISCIPLINE

2.1 Scope of the discipline and types of academic work

No.	Types of academic work	Total hours	Semester VI
1	Lectures	14	14
2	Practical classes	34	34
3	Independent work of students	24	24
	Total workload in hours	72	72
	Total workload in credit units	2	2

Explanation: The curriculum for the "Radiation Diagnostics" discipline for medical faculty students includes theoretical (lecture course) and practical training (practical classes).

Training is conducted during the VI semester and includes: 14 hours of lectures, 34 hours of clinical practical classes, type of final control - credit (in VI semester).

2.2 Thematic plan of lectures and their brief content

No.	Lecture Title	Lecture Content	Competency Codes	Workload (hours)
1.	Principles and methods of radiation diagnostics. Introduction to X-ray diagnostics.	Brief data on the history of X-ray and radiation diagnostics. Main private and special methods of X-ray examination. Technical progress in X-ray equipment. X-ray method of research (physical and technical foundations).	UC-1 GPC-1 PC-1 PC-2 PC-11	2
2.	Modern methods of medical visualization.	X-ray computed tomography. Ultrasound examination method. Magnetic resonance imaging. Radionuclide diagnostics. Physical foundations of methods, principles of equipment arrangement.	UC-1 GPC-1 PC-1 PC-2 PC-11	2
3	Radiation diagnostics of injuries and diseases of the musculoskeletal system.	Limits and possibilities of medical visualization methods in diagnosing injuries and diseases of the musculoskeletal system. Radiation methods of examination, CT, MRI diagnostics of the musculoskeletal system. X-ray symptomatology of bone and joint diseases.	UC-1 GPC-1 PC-1 PC-2 PC-11	2
4.	Radiation diagnostics of pathological changes in respiratory organs. Emergency conditions of the respiratory system in radiation images.	Limits and possibilities of medical visualization methods in diagnosing pathological changes in respiratory organs. Emergency conditions of the respiratory system in radiation images.	UC-1 GPC-1 PC-1 PC-2 PC-11	2

No.	Lecture Title	Lecture Content	Competency Codes	Workload (hours)
5.	Radiation diagnostics of heart and blood vessel diseases.	Possibilities and disadvantages of X-ray and ultrasound examination of the heart and blood vessels. Modern CT. Angiography and interventional diagnostic methods in angiology.	UC-1 GPC-1 PC-1 PC-2 PC-11	2
6.	Radiation diagnostics of digestive organ diseases.	Methodological aspects of radiation examination in diseases of the esophagus, stomach, intestines. Differential diagnosis of "acute abdomen" syndrome. Possibilities of radiation studies in the diagnosis of diseases of parenchymal organs of the abdominal cavity and biliary tracts. Diagnostic signs and radiation criteria for emergency conditions (biliary, pancreatic, portal hypertension, trauma and acute diseases of the liver, spleen, pancreas).	UC-1 GPC-1 PC-1 PC-2 PC-11	2
7.	Radiation diagnostics of genitourinary system diseases.	Radiation diagnostics of urgent diseases of the genitourinary system, semiotics of main diseases.	UC-1 GPC-1 PC-1 PC-2 PC-11	2
Total hours				**14**

2.3. Thematic plan of practical classes and their content.

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
1	Principles and methods of traditional X-ray diagnostics	Equipment and organization of an X-ray room (department). Basic and special methods of X-ray examination. Organization and technology of X-ray examinations, ensuring their safety. Office setup. Basic X-ray diagnostic methods: fluorography, fluoroscopy, and special examination techniques. Natural contrast. Methods of artificial contrast in X-ray diagnostics. General method of X-ray image analysis. Artificial contrast method in X-ray diagnostics. Types of contrast agents and requirements for them. Contrast of organ cavities and glandular ducts. General method of X-ray image analysis.	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4
2	Principles and methods of modern radiation diagnostics.	Modern methods of radiation diagnostics - physical principles and indications for	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3.	Solving situational problems and exercises,	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		clinical use. Basic methods of radiation diagnostics, their place in the general algorithm of radiation examination, the principle of obtaining diagnostic information. Reception of patients in specialized diagnostic rooms. Foundations and clinical application of ultrasound diagnostics. Foundations and clinical application of X-ray computed tomography. Foundations and clinical application of magnetic resonance imaging. Foundations and clinical application of radionuclide diagnostics.	PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	description of X-rays, testing in Moodle system.	
3	Radiation diagnostics of injuries and diseases of the musculoskeletal system.	Methods of radiation examination. X-ray method. RKT. Ultrasound. MRI. Radionuclide method. Normal radiation anatomy of organs of support and movement. Age-	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID:	Solving situational problems and exercises, description of X-rays, testing in	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		related features of changes in organs of support and movement. General radiation semiotics of pathological changes in organs of support and movement. General X-ray semiotics. General ultrasound semiotics. General MRI semiotics. General semiotics of pathological changes in radionuclide examination. Radiation semiotics of musculoskeletal system injuries: bone fractures, dislocations, soft tissue injuries.	11.1., 11.2., 11.3.	Moodle system.	

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
4	Radiation diagnostics of injuries and diseases of the musculoskeletal system.	Radiation semiotics of musculoskeletal system diseases. Acute hematogenous osteomyelitis. Panaritium. Bone and joint tuberculosis. Acute infectious purulent arthritis. Rheumatoid	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		arthritis. Bone tumors. Congenital dysplasias. Degenerative-dystrophic diseases. Endocrine and metabolic diseases. Endocrine intoxications. Radiation semiotics of soft tissue diseases.		Moodle system.	
5.	Radiation diagnostics of lung and diaphragm diseases.	X-ray normal anatomy of the lungs, method of analyzing X-rays of the chest, general symptoms and syndromes of respiratory organ diseases and injuries in traditional X-ray and CT examination.	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4
6	Radiation diagnostics of lung and diaphragm diseases	Radiation semiotics of main inflammatory and neoplastic diseases of the lungs. Acute pneumonia, acute lung abscess, bronchiectasis, emphysema. Pneumosclerosis localized. Diffuse interstitial disseminated lung diseases. Pneumoconioses. Pulmonary artery thromboembolism. Pulmonary edema. Central lung cancer. Peripheral lung cancer. Hematogenous metastases of malignant	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		tumors in the lung. Lung tuberculosis. Exudative pleurisy. Spontaneous pneumothorax. Mediastinal neoplasms. Radiation semiotics of lung and pleural injuries: pneumothorax, hemothorax, hemopneumothorax, lung contusion, lung rupture.			
7	Radiation diagnostics of cardiovascular system diseases.	Normal radiation anatomy of the heart and blood vessels. X-ray methods for heart and blood vessel examination. Scheme for analyzing cardiac shadow in basic projections. X-ray symptoms and syndromes in heart and blood vessel diseases: congenital, acquired heart defects, hypertension and ischemic heart disease, aneurysms and thrombosis of blood vessels, pericarditis. Comparative possibilities of ultrasound (ECG) and MRI in diagnostics of heart pathology.	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
8	Radiation diagnostics of digestive organ diseases	Normal X-ray anatomy of the esophagus, stomach, intestines. Methods of gastrointestinal tract examination, scheme for X-ray analysis. X-ray signs of main diseases of the gastrointestinal tract (diverticula, cicatricial, neoplastic, strictures, inflammation, ulcers). X-ray semiotics of hollow organ perforation, abdominal abscesses, intestinal obstruction. Methods of examination. Normal X-ray, CT, MRI, ultrasound anatomy of the liver, pancreas and biliary tracts. Ultrasound and magnetic	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2.	Solving situational problems and exercises, description of X-rays	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		resonance semiotics of liver and biliary tract diseases, especially in emergency conditions.			
9	Radiation diagnostics of biliary system diseases.	Radiation diagnostics of diseases and injuries of parenchymal organs of the digestive system. Liver: normal X-ray anatomy, methods of radiation examination. Radiation semiotics of liver and biliary tract diseases. Radiation semiotics of liver and biliary tract injuries. Pancreas and spleen: methods of radiation examination. Radiation semiotics of diseases and	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4

No.	Practical Class Title	Content of practical classes	Codes of formed competencies and indicators of their achievement	Types of control	Workload (hours)
		injuries of the pancreas and spleen.			
10	Radiation diagnostics of genitourinary system. Final credit control for the cycle.	Methods of radiation studies in urology, normal radiation anatomy of kidneys, urinary tracts. X-ray, ultrasound and magnetic resonance semiotics of urinary organs, urinary system, signs of main emergency conditions. Radiation diagnostics of diseases and injuries of sex organs.	UC-1. ID: 1.1., 1.2. GPC-1. ID: 1.1., 1.2., 1.3. PC-1. ID: 1.1., 1.2. PC-2. ID: 2.1., 2.4., 2.6. PC-11. ID: 11.1., 11.2., 11.3.	Solving situational problems and exercises, description of X-rays, testing in Moodle system.	3,4
Total					**34 hours**

2.4. Interactive forms of learning

To enhance students' cognitive activity in practical classes, interactive teaching methods are widely used (discussions, interactive surveys, computer simulations, discussions, analysis of a medical history, etc.), participation in the immunological laboratory, educational-research and research work of the department.

No.	Practical Class Topic	Workload in hours	Interactive learning form	Workload in hours, in % of class
1	Principles and methods of traditional X-ray diagnostics	3,4	Computer simulations Brainstorming Small group method	45 minutes (0.75 hours) / 14.7%
2	Principles and methods of modern radiation diagnostics.	3,4	Interactive survey. Small group method Business game	45 minutes (0.75 hours) / 14.7%
3	Radiation diagnostics of injuries and diseases of the musculoskeletal system	3,4	Business game Peer review of notes	45 minutes (0.75 hours) / 14.7%
4	Radiation diagnostics of injuries and diseases of the musculoskeletal system	3,4	Interactive survey. Peer review of essays	45 minutes (0.75 hours) / 14.7%
5	Radiation diagnostics of lung and diaphragm diseases.	3,4	Multimedia presentation	45 minutes (0.75 hours) / 14.7%
6	Radiation diagnostics of lung and diaphragm diseases	3,4	Interactive survey. Computer simulations Business game	45 minutes (0.75 hours) / 14.7%
7	Radiation diagnostics of cardiovascular system diseases.	3,4	Small group method Business game	45 minutes (0.75 hours) / 14.7%
8	Radiation diagnostics of digestive organ diseases	3,4	Working out practical skills of patient resuscitation	45 minutes (0.75 hours) / 14.7%

No.	Practical Class Topic	Workload in hours	Interactive learning form	Workload in hours, in % of class
9	Radiation diagnostics of biliary system diseases.	3,4	Interactive survey with multimedia presentation	45 minutes (0.75 hours) / 14.7%
10	Radiation diagnostics of genitourinary system. Final credit control for the cycle.	3,4	Multimedia presentation Small group method	45 minutes / (0.75 hours) 14.7%

2.5 Criteria for assessing learning outcomes

Assessment of learning outcomes is carried out in accordance with the "Regulations on the system for assessing student learning outcomes of Amur State Medical Academy of the Ministry of Health of Russia."

The basis for determining the level of knowledge, skills, and abilities are assessment criteria - completeness and correctness:

- correct, precise answer;
- correct, but incomplete or imprecise answer;
- incorrect answer; no answer.

When assigning grades, the classification of errors and their quality are taken into account:

- gross errors;
- repetitive errors;
- minor errors; shortcomings.

The success of students in mastering the topics of the "Radiation Diagnostics" discipline is determined by the quality of mastering knowledge, skills and practical abilities; the grade is assigned according to a five-point system: "5" - excellent, "4" - good, "3" - satisfactory, "2" - unsatisfactory.

Distribution of grades in practical classes of the semester

No.	Practical Class Topic	Theoretical part	Practical part	Overall grade
1	Principles and methods of traditional X-ray diagnostics	2-5	2-5	2-5

No.	Practical Class Topic	Theoretical part	Practical part	Overall grade
2	Principles and methods of modern methods of radiation diagnostics.	2-5	2-5	2-5
3	Radiation diagnostics of injuries and diseases of the musculoskeletal system	2-5	2-5	2-5
4	Radiation diagnostics of injuries and diseases of the musculoskeletal system	2-5	2-5	2-5
5	Radiation diagnostics of lung and diaphragm diseases.	2-5	2-5	2-5
6	Radiation diagnostics of lung and diaphragm diseases	2-5	2-5	2-5
7	Radiation diagnostics of cardiovascular system diseases.	2-5	2-5	2-5
8	Radiation diagnostics of digestive organ diseases	2-5	2-5	2-5
9	Radiation diagnostics of biliary system diseases.	2-5	2-5	2-5
10	Radiation diagnostics of genitourinary system. Final credit control for the cycle.	2-5	2-5	2-5

Assessment scales for current knowledge control

The success of students in mastering the discipline's practical skills and abilities is characterized by a qualitative assessment and is evaluated on a 5-point system: "5" - excellent, "4" - good, "3" - satisfactory, "2" - unsatisfactory. The conversion of the grade to a point scale is carried out according to the following scheme:

Quality of mastery	Grade on a 5-point scale
90-100%	"5"
80-89%	"4"
70-79%	"3"
less than 70%	"2"

Entrance control

Conducted at the first lesson, includes: problem and exercise solving; testing in the Moodle system **https://educ-amursma.ru/local/crw/course.php?id=596**.

Current control

Current control includes initial and final knowledge control.

Initial control - performed by the teacher at the beginning of each lesson in the form of a frontal survey, problem and exercise solving.

Final control - includes control of the technical performance of experiments and protocol drafting, written work on variants, testing in the Moodle system (**https://educ-amursma.ru/local/crw/course.php?id=596.**).

The final grade for current knowledge control is given on the day of the lesson, as the arithmetic mean result for all types of activities provided by the discipline's work program for that lesson.

Criteria for assessing oral answers

- "5" (excellent) – the student demonstrates deep and complete knowledge of the study material, makes no inaccuracies or distortions of facts in the presentation, presents the material in a logical sequence, is well-oriented in the material presented, and can reasonably justify their judgments.
- "4" (good) – the student has fully mastered the study material, is well-oriented in the study material, presents the material in a logical sequence, but makes some inaccuracies in the answer.
- "3" (satisfactory) – the student has mastered the main provisions of the practical lesson topic, but makes inaccuracies in the presentation of the study material, presents it incompletely and inconsistently, needs leading questions from the teacher for presentation, experiences difficulties in justifying expressed judgments.
- "2" (unsatisfactory) – the student has fragmented and unsystematic knowledge of the study material, cannot identify the main and secondary points, makes mistakes in defining basic concepts, distorts their meaning, cannot independently present the material.

Criteria for assessing the practical part

- "5" (excellent) – the student has fully mastered the practical skills and abilities provided by the work program of the discipline.
- "4" (good) – the student has fully mastered the practical skills and abilities provided by the work program of the discipline, but makes some inaccuracies.
- "3" (satisfactory) – the student possesses only some practical skills and abilities.
- "2" (unsatisfactory) – the student demonstrates the performance of practical skills and abilities with gross errors.

Criteria for assessing out-of-class independent work:

- level of student's mastery of the study material;
- completeness and depth of general educational concepts, knowledge and skills on the studied topic, to which this independent work belongs;
- formed universal, general professional and professional competencies (ability to apply theoretical knowledge in practice).
- problems and exercises are solved correctly, precise answers are given to test questions — "credit".
- problems and exercises are not solved correctly, imprecise answers are given to test questions — "no credit".

Criteria for assessing the essay:

- "5" (excellent) – the student has prepared a full, detailed essay on the chosen topic, formatted according to the requirements, presented their work in the form of a report with a computer presentation, and answered questions on the report topic;
- "4" (good) – the student has prepared a full, detailed essay, formatted according to the requirements, but poorly presented;
- "3" (satisfactory) – the essay contains information on the studied topic not in full, is formatted with errors, poorly presented;
- "2" (unsatisfactory) – the essay is not written, or written with gross errors, the report and computer presentation are not prepared, or their content does not correspond to the essay topic.

Working off absences for the discipline.

1. If a student missed a class for a valid reason, they have the right to make it up and receive the maximum grade provided by the discipline's work program for that class. The valid reason must be documented.
2. If a student missed a class for an invalid reason or received a "2" for all types of activities in the class, they are obligated to make it up. In this case, the grade received for all types of activities is multiplied by 0.8.

3. If a student is excused from a class by the dean's office (participation in sports, cultural-mass and other events), they receive a "5" for this class, provided they submit a report on the completion of the mandatory out-of-class independent work on the topic of the missed class.

Criteria for assessing intermediate certification.

Intermediate certification (credit exam) is intended to assess the degree of achievement of planned learning outcomes upon completion of the discipline and allows evaluating the level and quality of its assimilation by students.

The success of students in mastering the discipline is assessed on a 5-point system: "5" - excellent, "4" - good, "3" - satisfactory, "2" - unsatisfactory.

Criteria for assessing intermediate certification

Stages	**Grade on a 5-point scale**	**Binary scale**
Test control in Moodle system	3-5	credit
Full completion of the practical part of the discipline	3-5	
Completion of practical skills (control of competence formation)	3-5	
Test control in Moodle system	2	no credit
Full completion of the practical part of the discipline	2	
Completion of practical skills (control of competence formation)	2	

2.6. Independent work of students: classroom, extracurricular.

The organization of students' classroom independent work is carried out with the help of methodological guidelines for students, which contain learning objectives, a list of main theoretical questions for study, a list of practical works and their methodology, instructions for registering obtained results, discussing them and drawing conclusions, self-control tasks with answer standards, and a list of recommended literature.

From 1/4 to 1/2 of the practical class time is allocated for students' independent work: conducting research, recording results, discussing them, formulating conclusions, performing individual assignments. The preparatory stage, or the formation of the approximate basis of actions, begins with students in extracurricular time when preparing for a practical class, and ends in the class.

All subsequent stages are carried out in the class. The stage of materialized actions (solving problems according to an algorithm or without an algorithm, with a previously unknown answer) is carried out independently. The teacher, if necessary, provides consultations, assists, and at the same time controls the quality of students' knowledge and their ability to apply existing knowledge to solve assigned tasks.

Extracurricular independent work of students

No.	Topic	Time for preparation	Forms of extracurricular independent work of students
1	Principles and methods of traditional X-ray diagnostics	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation
2	Principles and methods of modern radiation diagnostics.	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation
3	Radiation diagnostics of injuries and diseases of the musculoskeletal system	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions;

No.	Topic	Time for preparation	Forms of extracurricular independent work of students
			• performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation

No.	Topic	Time for preparation	Forms of extracurricular independent work of students
4	Radiation diagnostics of injuries and diseases of the musculoskeletal system	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation
5	Radiation diagnostics of lung and diaphragm diseases.	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation

No.	Topic	Time for preparation	Forms of extracurricular independent work of students
6	Radiation diagnostics of lung and diaphragm diseases	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation
7	Radiation diagnostics of cardiovascular system diseases.	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • message • essay • presentation
8	Radiation diagnostics of digestive organ diseases	2 hours	• performing a practical task for control of topic assimilation • solving situational problems. • preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation

No.	Topic	Time for preparation	Forms of extracurricular independent work of students
9	Radiation diagnostics of biliary system diseases.	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • performing a practical task for control of topic assimilation • solving situational problems. • message • essay • presentation
10	Radiation diagnostics of genitourinary system. Final credit control for the cycle.	2 hours	• preparation for practical class (reading lectures, main and additional literature); • drawing up an answer plan for questions; • message • essay • presentation

Workload in hours	**20 hours**	**20 hours**	**4 hours**
Total workload in hours			
24 hours			

Mandatory schematic drawings and tables for practical classes preparation

Topics
1 Schematic projections of lobes and segments on direct and lateral lung X-rays. Normal CT of the lungs (median slice) with anatomical structures indicated.
2 Shadow occupying the entire 3rd segment of the lung. Shadow in atelectasis of the upper lobe of the right lung.

Topics
Ring-shaped shadow in the middle lobe of the lung in two projections. List the functional symptoms of lung diseases determined on a plain X-ray.
3 Focal pneumonia in the left lung. Lobar (croupous) pneumonia in the upper lobe of the right lung, 1st and 2nd stages (in 2 projections). Lung abscess, 2nd stage, in the middle lobe. Interlobar pleurisy in an accessory interlobar fissure in 2 projections. Hydrothorax in the right lung (plain X-ray). Total pneumosclerosis in the right lung.
4 Primary tuberculosis complex. Focal tuberculosis in the right lung. Fibrocavitary tuberculosis in the left lung. Classification of lung tuberculosis forms. Pneumoconiosis of the lungs (3 stages).
5 Exobronchial central lung cancer. Endobronchial cancer of the right lung. Stages of bronchial patency impairment. Peripheral lung cancer, 2nd stage: a) plain X-ray, b) computed tomography. Malignant mediastinal tumor. Echinococcosis of the lung (with pathognomonic symptom).
6 List the methods of radiation diagnostics for heart and blood vessel diseases. Mitral stenosis (with changes in the lungs). Mitral valve insufficiency. Aortic defect.
7 Aortic coarctation. Exudative pericarditis. Aneurysm of the thoracic aorta.
8 Scheme of the gastrointestinal tract with indications of anatomical sections. Esophageal diverticula. Achalasia of the esophagus. Esophageal cancer. Cicatricial stricture of the esophagus (chemical burn).

9 Acute gastric ulcer. Penetrating ulcer of the gastric body. Benign gastric tumor. Gastric cancer (exophytic, saucer-shaped). Acute mechanical intestinal obstruction. Colon cancer.
10 Liver scintigraphy in chronic hepatitis. Liver metastases - CT. Benign liver tumor - Ultrasound. Gallstones - Ultrasound. Kidney cancer - Ultrasound. Radionuclide renography in ureteral stone obstruction.
11 Scheme of a long bone in an adult and child (note features). Types of periostitis. Types of displacement of fragments in fractures (scheme). Table of symptoms in bone pathology. Acute osteomyelitis of the femur. Chronic osteomyelitis of the tibia. Tuberculosis of the knee joint (2nd stage). Tuberculosis of the spine (2nd stage). Osteochondroma. Osteogenic sarcoma. Multiple myeloma.
12 Table of radiation diagnostic methods for skull and brain pathology. Ischemic stroke - CT (with HU values). Intracerebral hemorrhage - CT (with HU values). Intracerebral cyst. Spinal osteochondrosis.
13 Units of dose and radioactivity measurement. Table of contraindications for radiation therapy of malignant tumors. Methods of radiation therapy - table.
14 Advantages and disadvantages of distant and close-range radiation therapy - table. Methods of radiation diagnostics in dentistry - table. Chronic periodontitis: a) granulomatous, b) granulomatous, c) fibrous.

Acute odontogenic osteomyelitis of the mandible. Follicular cyst.
15 Adamantinoma of the mandible. Malignant tumor of the mandible. Pneumothorax in the left lung. Perforation of a gastric ulcer.

2.7. Research (project) work

Research (project) work of students is an obligatory section of the discipline study and is aimed at the comprehensive formation of universal, general professional and professional competencies of students. Research (project) work involves studying special literature and other scientific and technical information about the achievements of domestic and foreign science and technology in the relevant field of knowledge, participating in research, etc. The topic is determined by students independently or in consultation with the teacher.

Research (project) work of students includes:

1. Independent study of additional literature on the chosen topic.
2. Compilation of literature reviews and Internet resources on the chosen topic.
3. Reports and presentations on the history of the issue.
4. Mastering radiation diagnostic methods: ultrasound, X-ray, magnetic resonance imaging, radionuclide.
5. Analysis of X-ray and magnetic resonance imaging methods for various pathologies.
6. Work with archival documents, analysis of clinical data, examination results, etc.
7. Collection and analysis of clinical data for specific pathologies, analysis of treatment methods.
8. Preparation of thematic meetings of the student club with essay presentations and results of independent work.
9. Preparation of reports for the final student conference.

List of recommended topics for research (project) work:

1. Assessment of the possibilities of radiation diagnostics of various types of pleurisy.
2. Radiation diagnostics of gastric ulcer.
3. Radiation diagnostics of diaphragmatic hernia with esophageal opening.
4. Radiation diagnostics of hematogenous osteomyelitis.

Criteria for assessing students' research (project) work:

- the material on research results in the report is presented in detail, specialized literature is thoroughly studied, scientific and technical information on the achievements of domestic and foreign science and technology in the relevant field of knowledge is studied - "credit".
- the material on research results in the report is presented insufficiently correctly, specialized literature is poorly studied, scientific and technical information on the achievements of domestic and foreign science and technology in the relevant field of knowledge is not studied - "no credit".

3. EDUCATIONAL-METHODOLOGICAL, MATERIAL-TECHNICAL AND INFORMATION SUPPORT OF THE DISCIPLINE

Electronic and digital technologies:

1. Online course on the discipline "Radiation Diagnostics" in the EIS of Amur State Medical Academy (**https://educ-amursma.ru/local/crw/course.php?id=596.**).

Characteristics of modules in the electronic information and educational course

Teaching	Controlling
Theoretical (lecture) material, video experiments, scientific-cognitive and educational films	Methodological recommendations for students on extracurricular independent work.
Methodological recommendations for students for practical classes.	List of recommended essay topics and regulations for essay writing.
Methodological recommendations for solving problems and exercises on discipline topics.	
Reference material, tables of standard values.	Tests: entrance, current and final knowledge control.

2. Multimedia presentations (Microsoft PowerPoint 2016), for lecture-type classes, (**https://educ-amursma.ru/local/crw/course.php?id=596**) according to the thematic plan of lectures:

Electronic slides

1. Outstanding domestic and foreign radiologists.
2. Principle of operation of a gas-discharge counter
3. Radioactive decay of P32, Co60, Tc99

Lectures (CD):

1. Principles and methods of traditional X-ray diagnostics.
2. Principles and methods of modern radiation diagnostic techniques.

3. Radiation diagnostics of injuries and diseases of the musculoskeletal system
4. Radiation diagnostics of lung and diaphragm diseases
5. Radiation diagnostics of cardiovascular system diseases.
6. Radiation diagnostics of digestive organ diseases
7. Radiation diagnostics of genitourinary system diseases.

Video films, photo materials, used in student training (prepared by department staff)

Video films (DVD)

1. X-ray diagnostics of gastrointestinal tract diseases.
2. Ultrasound diagnostics of heart diseases
3. Diagnosis of esophageal cancer

Photo materials: sets of educational X-rays, sonograms, scintigrams to each practical class

3.4. Equipment used for the educational process

No.	Name	Quantity
1	Head of department's office	
	Personal computer	1
	Set of electronic educational programs	1
	Set of educational films	1
	Set of multimedia presentations for the course of lectures	1
	Archive of photo materials on various topics	1
2	Assistant's office	
	Diaprojector	1
	Computer	1
	Tables	20

No.	Name	Quantity
	Set of X-rays, tomograms, computed tomograms, magnetic resonance tomograms	400
3	X-ray room AOOOD	3
4	CT room AOOOD	1
5	MRI room AOOOD	1
6	SPECT room AOOOD	1
7.	Ultrasound room	2
8.	Classroom 1-2	
	Negatoscope	4
	Stands	10
	Laptop	1
	Tables	20
	Set of X-rays, tomograms, computed tomograms, magnetic resonance tomograms	500
9	Associate professor's office	
	Computer	1
	Laptop	1
	Multimedia projector	1
10	Corridor	
	Stands	6

3.5. Professional databases, information and reference systems, electronic educational resources.

Resource Name	Resource Description	Access	Resource Address
Electronic Library Systems			
"Student Consultant" Electronic library of a medical university	For students and teachers of medical and pharmaceutical universities. Provides access to electronic versions of textbooks, manuals and periodicals.	Remote access, after registration under the university profile	**https://www.studentlibrary.ru/**
Reference and information system "MedBaseGeotar".	The reference and information system "MedBaseGeotar" is intended for practicing medical specialists, researchers, teachers, graduate students, residents, senior students, healthcare managers for quick search, selection and reading of medical literature from a single data source.	Remote access, after registration under the university profile	**https://mbasegeotar.ru/pages/index.html**
EBS "Bookup"	Large medical library-	Remote access,	**https://www.books-up.ru/**

Resource Name	Resource Description	Access	Resource Address
	information-educational platform for joint use of electronic textbooks, educational and methodological publications of medical universities in Russia and CIS countries	after registration under the university profile	
EBS "Lan"	Network electronic library of medical universities - electronic database of works of educational and scientific character in medical topics, created with the aim of implementing network forms of professional educational programs, open access to educational materials for partner universities	Remote access, after registration under the university profile	**https://e.lanbook.com/**
Scientific electronic library "CyberLeninka"	CyberLeninka is a scientific electronic library built on the paradigm of open	Free access	**https://cyberleninka.ru/**

Resource Name	Resource Description	Access	Resource Address
	science (Open Science), whose main tasks are to popularize science and scientific activity, public control over the quality of scientific publications, develop interdisciplinary research, a modern institute of scientific peer review, increase the citation of Russian science and build a knowledge infrastructure. Contains over 2.3 million scientific articles.		
Oxford Medicine Online	A collection of publications from Oxford University Press on medical topics, bringing together over 350 titles in a common resource with cross-search capabilities. Publications include The Oxford Handbook of Clinical Medicine and The Oxford Textbook	Free access	**http://www.oxfordmedicine.com**

Resource Name	Resource Description	Access	Resource Address
	of Medicine, whose electronic versions are constantly updated.		
Human Biology Knowledge Base	Reference information on physiology, cell biology, genetics, biochemistry, immunology, pathology. (Resource of the Institute of Molecular Genetics of the Russian Academy of Sciences.)	Free access	**http://humbio.ru/**
Medical online library	Free reference books, encyclopedias, books, monographs, abstracts, English literature, tests.	Free access	**https://www.medlib.ru/library/library/books**
Information systems			
Rubricator of clinical guidelines	Resource of the Ministry of Health of Russia, which publishes clinical guidelines developed and approved by medical non-profit organizations of the Russian	Link to download application	**https://cr.minzdrav.gov.ru/#!/**

Resource Name	Resource Description	Access	Resource Address
	Federation, as well as methodological guidelines, nomenclatures and other reference materials.		
Federal electronic medical library (FEMB)	The Federal electronic medical library is part of a unified state information system in the field of healthcare as a reference system. FEMB was created on the basis of the funds of the Central Scientific Medical Library named after I.M. Sechenov.	Free access	**https://femb.ru/**
Russian Medical Association	Professional internet resource. Goal: to promote effective professional activity of medical personnel. Contains charter, personalities, structure, rules of admission, information about the Russian Medical Union.	Free access	**http://www.rmass.ru/**

Resource Name	Resource Description	Access	Resource Address
Web-medicine	The site presents a catalog of professional medical resources, including links to the most authoritative thematic sites, journals, societies, as well as useful documents and programs. The site is intended for doctors, students, employees of medical universities and research institutions.	Free access	**http://webmed.irkutsk.ru/**

Databases			
World Health Organization	The site contains news, statistical data by country, included in the World Health Organization, information bulletins, reports, WHO publications and much more.	Free access	**http://www.who.int/ru/**
Ministry of Science and Higher Education of the Russian Federation	The site of the Ministry of Science and Higher Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**http://www.minobrnauki.gov.ru**
Ministry of Education of the Russian Federation	The site of the Ministry of Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**https://edu.gov.ru/**
Federal portal "Russian Education"	Single window of access to educational resources. This portal provides access to textbooks on all branches of medicine and healthcare.	Free access	**http://www.edu.ru/**
Polpred.com	Electronic library system Business media. Media review.	Free access	**https://polpred.com/news**
Bibliographic databases			
DB "Russian Medicine"	Created at the Central Scientific Medical Library, covers the entire fund starting from 1988. The database contains bibliographic descriptions of articles from domestic journals and collections, dissertations and their abstracts, as well as domestic and foreign books,	Free access	**https://rucml.ru/**

	collections of works by institutes, conference materials, etc. Thematically, the database covers all areas of medicine and related areas of biology, biophysics, biochemistry, psychology, etc.		
PubMed	Text database of medical and biological publications in English. The PubMed database is an electronic search system with free access to 30 million publications from 4800 indexed medical journals. The database contains articles published from 1960 to the present day, including information from MEDLINE, PreMEDLINE, NLM. Each year, the portal is updated with more than 500 thousand new works.	Free access	**https://pubmed.ncbi.nlm.nih.gov/**
eLIBRARY.RU	Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 13 million scientific articles and publications. Electronic versions of more than 2000 Russian scientific and technical journals are available on the eLIBRARY.RU platform, including more than 1000 journals in open access.	Full site functionality available after registration	**http://elibrary.ru/defaultx.asp**
Electronic library of dissertations (RSL)	Currently, the Electronic library of dissertations of the Russian State Library contains over 919,000 full texts of dissertations and abstracts.	Free access	**http://diss.rsl.ru/?menu=disscatalog/**

Medline.ru	Medical and biological portal for specialists. Biomedical journal.	Free access	**https://journal.scbmt.ru/jour/index**
Official internet portal of legal information	Unified official state information and legal resource in Russia	Free access	**http://pravo.gov.ru/**

3.6. Licensed and freely distributed software used in the educational process.

List of software (commercial software products)

No.	List of software (commercial software products)	Supporting documents
1.	Operating system MS Windows 7 Pro	License number 48381779
2.	Operating system MS Windows 10 Pro	AGREEMENT No. UT-368 dated 21.09.2021
3.	MS Office	License number: 43234783, 67810502, 67580703, 64399692, 62795141, 61350919
4.	Kaspersky Endpoint Security for Business – Standard Russian Edition. 50-99 Node 1 year Educational Renewal License	Agreement No. 7 AA dated 07.02.2025
5.	1C Accounting and 1C Payroll	LICENSE AGREEMENT 612/L dated 02.02.2022 (add. license)
6.	1C: University PROF	LICENSE AGREEMENT No. KrTsB-004537 dated 19.12.2023
7.	1C: Library PROF	LICENSE AGREEMENT No. 2281 dated 11.11.2020
8.	Consultant Plus	Contract No. 41AA dated 27.12.2024
9.	Contour.Talk	Agreement No. K213753/24 dated 13.08.2024

No.	List of software (commercial software products)	Supporting documents
10.	Electronic learning environment 3KL (Russian Moodle)	Agreement No. 1362.5 dated 20.11.2024
11.	Astra Linux Common Edition	Agreement No. 142 A dated 21.09.2021
12.	Information system "Plans"	Agreement No. 2873-24 dated 28.06.2024
13.	1C: Document Management	Agreement No. 2191 dated 15.10.2020
14.	R7-Office	Agreement No. 2 KS dated 18.12.2020
15.	License "OS ROSA HROME workstation"	Agreement No. 884 dated 22.08.2024
16.	Alt Server Virtualization 10 (for secondary vocational and higher professional education)	Agreement No. 14AK dated 27.09.2024
17.	Dr.Web Desktop Security Suite Comprehensive protection + Control Center for 12 months.	Agreement No. 8 dated 21.10.2024
18.	Software "Schedule for educational institutions"	Agreement No. 82A dated 30.07.2024

List of freely distributed software

No.	List of freely distributed software	Links to license agreement
1.	Yandex Browser	Free distribution License agreement for the use of Yandex Browser programs **https://yandex.ru/legal/browser_agreement/**
2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/telemost_mobile_agreement/**

No.	List of freely distributed software	Links to license agreement
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

3.1 Main Literature (Actualized with 2025-2026 data)

Radiation diagnostics

- Radiation diagnostics: textbook / edited by G. E. Trufanov. - 3rd ed., revised and supplemented. - Moscow: GEOTAR-Media, 2023. - 484 p. - ISBN 978-5-9704-7916-2. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970479162.html** (accessed: 30.10.2024). - Access mode: by subscription.
- Shamov, I. A. Propaedeutics of internal diseases with elements of radiation diagnostics: textbook / I. A. Shamov. - Moscow: GEOTAR-Media, 2019. - 512 p. - 512 p. - ISBN 978-5-9704-5182-3. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970451823.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Fundamentals of radiation diagnostics: textbook / D. A. Lezhnev, I. V. Ivanova, E. A. Egorova [et al.]. - 2nd ed., supplemented. - Moscow: GEOTAR-Media, 2022. - 128 p. - ISBN 978-5-9704-7267-5. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970472675.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Ilyasova, E. B. Radiation diagnostics: textbook / E. B. Ilyasova, M. L. Chekhonatskaya, V. N. Priezzheva. - 2nd ed., revised and supplemented. - Moscow: GEOTAR-Media, 2021. - 432 p. - ISBN 978-5-9704-5877-8. - Text: electronic // EBS "Student Consultant": [site]. -

URL: **https://www.studentlibrary.ru/book/ISBN9785970458778.html** (accessed: 07.11.2024). - Access mode: by subscription.

3.2 Additional Literature (Actualized with 2025-2026 data)

- Radiation diagnostics of non-specific purulent-inflammatory diseases of the spine: a guide for doctors / edited by V. A. Manukovsky, V. E. Savello, I. S. Afanasyeva. - Moscow: GEOTAR-Media, 2024. - 128 p. - ISBN 978-5-9704-8418-0, DOI: 10.33029/9704-8418-0-MSA-2024-1-128. - Electronic version available on the EBS "Student Consultant" website: [site]. URL: **https://www.studentlibrary.ru/book/ISBN9785970484180.html** (accessed: 30.10.2024). - Access mode: by subscription. - Text: electronic
- Trufanov, G. E. Computed tomography in the diagnosis of pneumonia. Atlas / edited by G. E. Trufanov, A. S. Grishchenkova. - Moscow: GEOTAR-Media, 2021. - 304 p. - ISBN 978-5-9704-5946-1. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970459461.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Aleksandrovich A.S. Radiation diagnostics and radiation therapy: textbook for students / A.S. Aleksandrovich, T.V. Semenyuk, E.S. Zaretskaya. - Grodno: GrGMU, 2022. - 428 p. - ISBN 9789855956717. - Text: electronic // EBS "Bookup": [site]. - URL: **https://www.books-up.ru/ru/book/luchevaya-diagnostika-i-luchevaya-terapiya-15716625** Access mode: by subscription.

3.7. Resources of the information and telecommunication network "Internet" (Actualized with 2025-2026 data)

- Electronic address of the Amur State Medical Academy library: **https://amurgma.ru/obuchenie/biblioteki/biblioteka-amurskoy-gma/**
- Electronic address of the Electronic library system "Student Consultant": **https://www.studentlibrary.ru**
- Electronic library of medical literature: **https://www.books-up.ru/ru/entrance/97977feab00ecfbf9e15ca660ec129c0/**

4. FUND OF ASSESSMENT TOOLS

4.1. Current test control (entrance, initial, milestone, exit), final.

4.1.1 Examples of entrance control test tasks (with answer standards)

Test tasks are located in the Moodle system. Access mode: **https://educ-amursma.ru/local/crw/course.php?id=596**
Total number of tests — 100.

4.1.2 Examples of initial control test tasks (with answer standards)

Test tasks are located in the Moodle system. Access mode: **https://educ-amursma.ru/local/crw/course.php?id=596**
Total number of tests — 200.

1. FOR ARTIFICIAL CONTRASTING, THE FOLLOWING ARE USED

1. barium sulfate
2. gases (oxygen, nitrous oxide)
3. organic iodine compounds
4. all of the above

2. PRINCIPLES OF PROTECTION AGAINST IONIZING RADIATION
    1. shielding
    2. distancing
    3. time protection
    4. all of the above
3. FOR ARTIFICIAL CONTRASTING, THE FOLLOWING ARE USED
    1. barium sulfate
    2. gases (oxygen, nitrous oxide)
3. organic iodine compounds
4. all of the above

Answer: 1-4, 2-4, 3-4

4.1.3 Examples of exit control test tasks (with answer standards)

Test tasks are located in the Moodle system. Access mode: **https://educ-amursma.ru/local/crw/course.php?id=596**
Total number of tests — 200.

1. ORGANIC PROTRUSION ON THE ESOPHAGEAL CONTOUR CAN BE OBSERVED IN:
    1. diverticulum
    2. esophagitis
    3. cancer
    4. chemical burn of the esophagus
2. ESOPHAGEAL LUMEN WIDENING IS OBSERVED IN:
    1. achalasia of the cardia
    2. esophageal displacement by surrounding organs
    3. esophageal cancer
    4. chemical burn
3. A SIGN OF PERFORATION OF A HOLLOW ORGAN IS:

1. pneumoperitoneum
2. meteorism
3. Kloiber's cup
4. absence of gas bubble in the stomach

Answers: 1-1, 2-1, 3-1

4.1.4. Examples of final control test tasks (with answer standards)

Test tasks are located in the Moodle system. Access mode: **https://educ-amursma.ru/local/crw/course.php?id=596**
Total number of tests — 200.

1. SUMMATION OF X-RAY IMAGE
    1. facilitates the detection of pathological changes
    2. hinders the detection of pathological changes
    3. does not affect the detectability of pathological changes
    4. increases image contrast
2. GREATEST RADIATION LOAD OCCURS DURING
    1. radiography
    2. fluoroscopy
    3. fluorography
    4. thermography
3. TOMOGRAPHY ALLOWS TO
    1. study the structure of a pathological object
    2. its form
    3. relationship with surrounding organs and tissues
4. all answers are correct

Answer: 1-2, 2-2, 3-2

4.2. Clinical situational tasks

Situational tasks for the class on radiation diagnostics of musculoskeletal system diseases.

Task №1. Patient B., 46 years old. Complaints of pain and limited movement in the left hand. Fell on the left hand yesterday. Objectively, swelling in the area of the left wrist joint. Your tactics? Write a referral for examination.

Task №2. Patient A., 30 years old. Complaints of severe pain in the left hip joint, increasing with load. Objective: shortening of the left leg, limited movements in the joint. Body temperature - 37.6.

What disease can be suspected? What X-ray picture is characteristic of this disease? With what diseases should it be differentiated?

Task №3. Patient K., 36 years old. Complains of sudden pain in the upper third of the lower leg, pain increases, chills appeared. From anamnesis: frequent exacerbations of chronic tonsillitis. Objective: lower leg on examination has local swelling, hyperemia, on palpation - local temperature increase of the lower leg and tenderness. Question: doctor's tactics? What disease did you think of?

Task №4. Patient Zh., 55 years old. Complains of pain in the knee joints. On examination, slight swelling, skin is not hyperemic, movements are full, painful. What disease can be suspected? What symptoms will you note on X-rays of the knee joints? With what diseases should it be differentiated and how to conduct differential diagnosis?

Task №5. Patient G., 19 years old. Complains of pain in the lower third of the right thigh. From anamnesis: thigh trauma 5 months ago. Objective: swelling of the lower third of the thigh. Body temperature is normal, locally elevated, no skin hyperemia. Question: what are your tactics?

Situational tasks for the class on radiation diagnostics of chest organ diseases

Task №1. A 2-year-old child was delivered to the emergency hospital with severe shortness of breath, rapid breathing and heart palpitations. According to the mother, the child was left unattended and ate seeds, was found in a severe condition. Is X-ray assistance possible in diagnosing a foreign body in the respiratory tract and what kind?

Task №2. Patient 65 years old, has had pneumonia twice in the last six months. Complains of cough with sputum, increased fatigue, subfebrile temperature. Objective: Shortened percussion sound below the left scapula, weakened breathing. Write a referral for X-ray examination.

Task №3. A medical institute student underwent a prophylactic fluorographic examination and a localized darkening was found in the right lung. Your actions for further examination.

Task №4. Patient Sh., 45 years old, no complaints. During fluorographic examination, a round shadow was found in the right upper lobe. Your X-ray methods are necessary for further examination? Conduct differential diagnosis.

Task №5. Patient I., 45 years old. Complaints of elevated temperature, poor well-being, cough with a large amount of purulent sputum. Often suffers from colds.

What X-ray methods should be performed? Possible X-ray picture.

Situational tasks for the class on radiation diagnostics of cardiovascular system diseases

Task №1. Patient 35 years old, complains of shortness of breath, often suffered from angina in childhood. Objective: expansion of cardiac dullness on percussion, especially the left border of the heart, systolic murmur on auscultation. Write a referral for examination. What pathological symptoms can be seen in this patient?

Task №2. During a prophylactic fluorographic examination of a 25-year-old male, expansion of lung roots, increased heart size, flattening of the "waist" of the heart were found. Your actions for further examination.

Task №3. Child 8 years old, lags behind peers in physical development. X-ray of the chest shows an increase in heart size, a change in the shape of the cardiovascular bundle. Your tactics.

Task №4. Patient 40 years old, complains of shortness of breath, weakness, rapid heart rate, swelling in the legs, evening temperature rise to 37.5. Objective: expansion of heart borders, muffled tones. What diseases can be thought of? What further examination methods are needed and what will be revealed?

Task №5. Patient 40 years old, no complaints. X-ray shows sharply expanded upper mediastinum. Heart borders are not enlarged. No murmurs on auscultation. Your tactics for examining the patient.

Situational tasks for the class on radiation diagnostics of digestive organ diseases

Task №1. Patient 30 years old. Complains of acute pain in the right iliac region for a day. 3 days ago accidentally swallowed a nail. Your presumptive diagnosis? Write a referral for examination.

Task №2. Patient 45 years old, for 2 months has difficulty swallowing solid food. Dysphagia is increasing. Pain in the epigastrium appeared. Your examination tactics. **Task №3.** Patient 50 years old, complains of poor appetite, nausea, sometimes vomiting. Lost 3 kg in 2 months. Make an examination plan, write a referral.

Task №4. A 55-year-old patient suffering from chronic constipation, during abdominal palpation, an movable painless tumor-like formation of dense elastic consistency was found in the left iliac region. What X-ray methods can be used in the diagnosis of the disease?

Task №5. A 40-year-old patient developed acute abdominal pain 1 hour after eating. After 2 hours, delivered by ambulance to the emergency department of the hospital with a diagnosis of "acute abdomen". Your actions as the duty doctor.

Task №6. A one-year-old child was brought to the hospital with severe abdominal pain, vomiting, stool and gas retention for a day. Objective: abdomen distended, tense. What diagnostic methods will you use and what information do you expect to receive?

4.3. List of practical skills a student must possess after mastering the discipline

1. Correct placement of X-ray images on a negatoscope
2. Differentiation of direct, lateral, and oblique projections on chest X-rays
3. Differentiation of darkening and clearing in the lung
4. Determination of the size and shape of darkening in the lung
5. Assessment of the structure and condition of the contours of darkening
6. Determination of the shape (configuration) of the heart
7. Differentiation of the heart's border-forming arcs
8. Diagnosis of mitral, aortic heart defects, and aortic diseases
9. Determination of the shape and location of the esophagus, stomach, and large intestine
10. Detection of X-ray symptoms of gastrointestinal diseases
11. Differentiation of signs of inflammatory and neoplastic gastric diseases (ulcer, cancer) and their complications.
12. Detection of symptoms of musculoskeletal system diseases

13. Adequate placement of bone X-rays taking into account the location of their proximal and distal parts relative to the skeleton
14. Diagnosis of fractures of long tubular bones
15. Detection of differences between neoplastic and inflammatory diseases of the musculoskeletal system.

4.4. List of questions for the credit exam

1. What types of radiation diagnostics do you know?
2. What methods of radiation diagnostics are ionizing?
3. What measures contribute to reducing patient exposure during X-ray examination?
4. Name the main methods of X-ray examination of respiratory organs. List the indications for their use.
5. List additional (special) X-ray methods used in the examination of respiratory organs. Name the indications for them.
6. List the sequence of analysis of a direct chest X-ray.
7. Determine the projection of the upper, middle, and lower lobes of the lung on direct and lateral chest X-rays.
8. Indicate the level of location of the right and left diaphragmatic domes on a direct chest X-ray.
9. What are the age-related features of the X-ray image of the chest organs?
10. Are unchanged intrathoracic lymph nodes visible on X-rays?
11. Where are the main groups of intrathoracic lymph nodes located? Name them.
12. Name the main X-ray symptoms of inflammatory lung diseases?
13. What diseases of the respiratory organs feature the symptom of pulmonary pattern deformation?
14. List the main X-ray signs of lung abscess?
15. What types of pleurisy should be distinguished in X-ray examination?
16. In what cases, if there is fluid in the pleural cavity, does its upper level have a horizontal direction?
17. What are the main X-ray signs of unilateral total pleurisy?
18. List the leading X-ray symptoms of pneumothorax?
19. What is seen on X-rays in atelectasis of the upper lobe on the right and left?
20. What is revealed on X-rays in atelectasis of the entire lung? With what diseases should this picture be differentiated?
21. In what lung diseases is the "round shadow" symptom detected?

22. What are the age-related features of heart position?
23. How does the configuration and size of the heart change with age in children, and what distinguishes it?
24. In what projections are the shape of the heart and the size of its individual chambers studied?
25. What does artificial contrasting of the esophagus give in X-ray examination of the heart?
26. For studying which parts of the heart is an X-ray in the first oblique projection most appropriate?
27. Name the main and additional X-ray methods for examining the heart and large vessels?
28. What are the diagnostic capabilities of probing and angiocardiography in heart examination?
29. What are the signs of left atrial enlargement?
30. What sign in the X-ray picture is the basis for the classification of congenital heart defects?
31. List congenital heart defects with unchanged pulmonary blood flow. What are their X-ray signs?
32. What changes in the bony skeleton of the chest are observed in coarctation of the aorta?
33. Name congenital heart defects with reduced heart blood flow?
34. Name congenital heart defects that occur with increased pulmonary blood flow?
35. How does the X-ray picture of an atrial septal defect differ from a ventricular septal defect?
36. Is diagnosis of patent ductus arteriosus possible without angiocardiography?
37. What signs are characteristic of patent ductus arteriosus?
38. What is the X-ray picture of mitral stenosis?
39. What characterizes the skiagraphic picture of mitral valve insufficiency?
40. Name the X-ray symptoms of aortic valve defects?
41. What characterizes the X-ray picture in myocardial and pericardial lesions?
42. Name the main and additional methods of X-ray examination of bones and joints?
43. What X-ray signs are direct evidence of continued bone growth?
44. List the bones in which epiphyseal ossification nuclei are formed in utero. Which of these ossification nuclei can be used to determine fetal maturity?
45. What are the main skiagraphic signs that characterize changes in bones and joints?
46. Indicate the main and secondary signs of osteoporosis?
47. Name different variants of diffuse osteoporosis?
48. What characterizes the main and additional signs of osteosclerosis?

49. List the main X-ray signs of bone tissue destruction. How do destruction areas differ from focal osteoporosis?
50. In what parts of long tubular bones do spongy and compact bone sequestra occur? Name their signs.
51. What is the typical location of compact sequestra in tubular bones?
52. List variants of periosteal changes in the X-ray image?
53. What are the typical skiagraphic manifestations of congenital skeletal malformations?
54. What types of bone fractures are most typical for childhood? List their symptoms.
55. What characterizes the picture of congenital hip dislocation?
56. List the signs characteristic of epiphyseal localization of hematogenous osteomyelitis.
57. What skiagraphic symptoms correspond to diaphyseal localization of chronic hematogenous osteomyelitis?
58. What benign bone tumors are most common in children? Name their symptoms.
59. What characterizes the typical X-ray manifestations of malignant bone tumors?
60. What are the indications for X-ray examination of digestive organs in children?
61. What is characteristic of the skiagraphic picture of the abdominal cavity in young children?
62. Name the age-related features of the stomach revealed during X-ray examination?
63. What distinguishes the method of X-ray examination of the stomach in children?
64. What contrast agents are used for X-ray examination of digestive organs in childhood?
65. Name the methods of X-ray examination of the rectum. What are their features in children?
66. List the morphological and functional symptoms of gastrointestinal diseases?
67. In what processes and diseases is diffuse and localized narrowing of the lumen of the digestive tube encountered?
68. For what processes and diseases is localized and diffuse expansion of the lumen of the digestive tube characteristic?
69. What is the place of functional symptoms in the recognition of digestive organ diseases?
70. List the main malformations of the digestive organs and their most characteristic X-ray symptoms?
71. What types of esophageal atresia can be detected?
72. Name the signs of congenital pyloric stenosis?
73. How does congenital pyloric stenosis differ radiographically from pylorospasm?
74. How are congenital atresia of the intestines and rectum detected radiographically?
75. List the possibilities of X-ray examination of foreign bodies in the gastrointestinal tract?

76. Name the X-ray signs of esophageal burns?

77. What are the X-ray symptoms of peptic ulcer and gastritis in childhood?

78. List the X-ray symptoms characteristic of acute intestinal obstruction.

79. What X-ray symptoms are observed in intestinal invagination?

80. What is characteristic of the X-ray picture of Hirschsprung's disease?

81. Name the X-ray signs of diaphragmatic hernias?

APPROVED

at the meeting of the Department of Radiation Diagnostics,
Radiation Therapy with an Oncology Course

Protocol No. 9 dated May 26, 2023

Head of Department, Professor, Doctor of Medical Sciences
Gordienko V.P.

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

FOR THE DISCIPLINE "RADIATION DIAGNOSTICS"

SPECIALTY 31.05.01 GENERAL MEDICINE

FOR THE 2023 – 2024 ACADEMIC YEAR

The work program has been supplemented with new software:

1. Make changes on page 39, actualize the table in the section "Licensed and freely distributed software used in the educational process."

List of software (commercial software products)

No.	List of software (commercial software products)	Supporting documents
1.	Operating system MS Windows 7 Pro	License number 48381779
2.	Operating system MS Windows 10 Pro	AGREEMENT No. UT-368 dated 21.09.2021
3.	MS Office	License number: 43234783, 67810502, 67580703, 64399692, 62795141, 61350919
4.	Kaspersky Endpoint Security for Business Expanded	Agreement 165A dated 25.11.2022

No.	List of software (commercial software products)	Supporting documents
5.	1C Accounting and 1C Payroll	LICENSE AGREEMENT 612/L dated 02.02.2022
6.	1C: University PROF	LICENSE AGREEMENT No. TsB-1151 dated 01.14.2022
7.	1C: Library PROF	LICENSE AGREEMENT No. 2281 dated 11.11.2020
8.	Consultant Plus	Agreement No. 37/S dated 25.02.2022
9.	Action 360	Agreement No. 574 dated 16.11.2021
10.	Electronic learning environment 3KL (Russian Moodle)	Agreement No. 1362.2 dated 15.11.2021
11.	Astra Linux Common Edition	Agreement No. 142 A dated 21.09.2021
12.	Information system "Plans"	Agreement No. 8245 dated 07.06.2021
13.	1C: Document Management	Agreement No. 2191 dated 15.10.2020
14.	R7-Office	Agreement No. 2 KS dated 18.12.2020

List of freely distributed software

No.	List of freely distributed software	Links to license agreement
1.	Yandex Browser	Free distribution License agreement for the use of Yandex Browser programs **https://yandex.ru/legal/browser_agreement/**
2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/telemost_mobile_agreement/**

No.	List of freely distributed software	Links to license agreement
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

APPROVED

at the meeting of the Department of Radiation Diagnostics,
Radiation Therapy with an Oncology Course

Protocol No. 9 dated 06.05.2024

Head of Department, Professor, Doctor of Medical Sciences
V.P. Gordienko

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

"RADIATION DIAGNOSTICS"

SPECIALTY General Medicine

FOR THE 2024 – 2025 ACADEMIC YEAR

1. Make changes and actualize the table in the section "Professional databases, information and reference systems, electronic educational resources."

Electronic Library Systems

Resource Name	Resource Description	Access	Resource Address
"Student Consultant" Electronic library of a medical university.	For students and teachers of medical and pharmaceutical universities. Provides access to electronic versions of textbooks, manuals and periodicals.	Remote access, after registration under the university profile	**http://www.studmedlib.ru/**
"Doctor Consultant" Electronic medical library.	Materials placed in the library are developed by leading Russian specialists based on modern scientific knowledge (evidence-based medicine). Information is prepared taking into account the position of the scientific and practical medical society (global, European and Russian) in the relevant specialty. All materials undergo mandatory independent peer review.	Remote access, after registration under the university profile	**http://www.rosmedlib.ru/cgi-bin/mb4x**
EBS "Bookup"	Large medical library-information-educational platform for joint use of electronic textbooks, educational and methodological publications of medical universities in Russia and CIS countries	Remote access, after registration under the university profile	**https://www.books-up.ru/**
EBS "Lan"	Network electronic library of medical universities - electronic database of works of educational and scientific character in medical topics, created with the aim of implementing network forms of	Remote access, after registration under the university profile	**https://e.lanbook.com/**

Resource Name	Resource Description	Access	Resource Address
	professional educational programs, open access to educational materials for partner universities		
Scientific electronic library "CyberLeninka"	CyberLeninka is a scientific electronic library built on the paradigm of open science (Open Science), whose main tasks are to popularize science and scientific activity, public control over the quality of scientific publications, develop interdisciplinary research, a modern institute of scientific peer review, increase the citation of Russian science and build a knowledge infrastructure. Contains over 2.3 million scientific articles.	Free access	**https://cyberleninka.ru/**
Oxford Medicine Online	A collection of publications from Oxford University Press on medical topics, bringing together over 350 titles in a common resource with cross-search capabilities. Publications include The Oxford Handbook of Clinical Medicine and The Oxford Textbook of Medicine, whose electronic versions are constantly updated.	Free access	**http://www.oxfordmedicine.com**
Human Biology Knowledge Base	Reference information on physiology, cell biology, genetics, biochemistry, immunology, pathology.	Free access	**http://humbio.ru/**

Resource Name	Resource Description	Access	Resource Address
	(Resource of the Institute of Molecular Genetics of the Russian Academy of Sciences.)		
Medical online library	Free reference books, encyclopedias, books, monographs, abstracts, English literature, tests.	Free access	**https://www.medlib.ru/library/library/bool**
Information systems			
Rubricator of clinical guidelines	Resource of the Ministry of Health of Russia, which publishes clinical guidelines developed and approved by medical non-profit organizations of the Russian Federation, as well as methodological guidelines, nomenclatures and other reference materials.	Link to download application	**https://cr.minzdrav.gov.ru/#!/**
Federal electronic medical library (FEMB)	The Federal electronic medical library is part of a unified state information system in the field of healthcare as a reference system. FEMB was created on the basis of the funds of the Central Scientific Medical Library named after I.M. Sechenov.	Free access	**https://femb.ru/**
Russian Medical Association	Professional internet resource. Goal: to promote effective professional activity of medical personnel. Contains charter,	Free access	**http://www.rmass.ru/**

Resource Name	Resource Description	Access	Resource Address
	personalities, structure, rules of admission, information about the Russian Medical Union.		
Web-medicine	The site presents a catalog of professional medical resources, including links to the most authoritative thematic sites, journals, societies, as well as useful documents and programs. The site is intended for doctors, students, employees of medical universities and research institutions.	Free access	**http://webmed.irkutsk.ru/**
Databases			
World Health Organization	The site contains news, statistical data by country, included in the World Health Organization, information bulletins, reports, WHO publications and much more.	Free access	**http://www.who.int/ru/**
Ministry of Science and Higher Education of the Russian Federation	The site of the Ministry of Science and Higher Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**http://www.minobrnauki.gov.ru**

Ministry of Education of the Russian Federation	The site of the Ministry of Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**https://edu.gov.ru/**
Federal portal "Russian Education"	Single window of access to educational resources. This portal provides access to textbooks on all branches of medicine and healthcare.	Free access	**http://www.edu.ru/**
Polpred.com	Electronic library system Business media. Media review.	Free access	**https://polpred.com/news**
Bibliographic databases			
DB "Russian Medicine"	Created at the Central Scientific Medical Library, covers the entire fund starting from 1988. The database contains bibliographic descriptions of articles from domestic journals and collections, dissertations and their abstracts, as well as domestic and foreign books, collections of works by institutes, conference materials, etc. Thematically, the database covers all areas of medicine and related areas of biology, biophysics, biochemistry, psychology, etc.	Free access	**https://rucml.ru/**

PubMed	Text database of medical and biological publications in English. The PubMed database is an electronic search system with free access to 30 million publications from 4800 indexed medical journals. The database contains articles published from 1960 to the present day, including information from MEDLINE, PreMEDLINE, NLM. Each year, the portal is updated with more than 500 thousand new works.	Free access	**https://pubmed.ncbi.nlm.nih.gov/**
eLIBRARY.RU	Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 13 million scientific articles and publications. Electronic versions of more than 2000 Russian scientific and technical journals are available on the eLIBRARY.RU platform, including more than 1000 journals in open access.	Full site functionality available after registration	**http://elibrary.ru/defaultx.asp**
Electronic library of dissertations (RSL)	Currently, the Electronic library of dissertations of the Russian State Library contains over 919,000 full texts of dissertations and abstracts.	Free access	**http://diss.rsl.ru/?menu=disscatalog/**

Medline.ru	Medical and biological portal for specialists. Biomedical journal.	Free access	**https://journal.scbmt.ru/jour/index**
Official internet portal of legal information	Unified official state information and legal resource in Russia	Free access	**http://pravo.gov.ru/**

3.6. Licensed and freely distributed software used in the educational process.

List of software (commercial software products)

No.	List of software (commercial software products)	Supporting documents
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2.	Operating system MS Windows 10 Pro	AGREEMENT No. UT-368 dated 21.09.2021
3.	MS Office	License number: 43234783, 67810502, 67580703, 64399692, 62795141, 61350919
4.	Kaspersky Endpoint Security for Business – Standard Russian Edition. 50-99 Node 1 year Educational Renewal License	Agreement No. 7 AA dated 07.02.2025
5.	1C Accounting and 1C Payroll	LICENSE AGREEMENT 612/L dated 02.02.2022 (add. license)
6.	1C: University PROF	LICENSE AGREEMENT No. KrTsB-004537 dated 19.12.2023
7.	1C: Library PROF	LICENSE AGREEMENT No. 2281 dated 11.11.2020
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No.	List of freely distributed software	Links to license agreement
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2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/telemost_mobile_agreement/**

No.	List of freely distributed software	Links to license agreement
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

APPROVED

at the meeting of the Department of Radiation Diagnostics,
Radiation Therapy with an Oncology Course

Protocol No. 9 dated May 26, 2023

Head of Department, Professor, Doctor of Medical Sciences
Gordienko V.P.

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

FOR THE DISCIPLINE "RADIATION DIAGNOSTICS"

SPECIALTY 31.05.01 GENERAL MEDICINE

FOR THE 2023 – 2024 ACADEMIC YEAR

The work program has been supplemented with new software:

1. Make changes on page 39, actualize the table in the section "Licensed and freely distributed software used in the educational process."

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2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/telemost_mobile_agreement/**
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

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V.P. Gordienko

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

"RADIATION DIAGNOSTICS"

SPECIALTY General Medicine

FOR THE 2024 – 2025 ACADEMIC YEAR

1. Make changes and actualize the table in the section "Professional databases, information and reference systems, electronic educational resources."

Electronic Library Systems

Resource Name	Resource Description	Access	Resource Address
"Student Consultant" Electronic library of a medical university.	For students and teachers of medical and pharmaceutical universities. Provides access to electronic versions of textbooks, manuals and periodicals.	Remote access, after registration under the university profile	**http://www.studmedlib.ru/**
"Doctor Consultant" Electronic medical library.	Materials placed in the library are developed by leading Russian specialists based on modern scientific knowledge (evidence-based medicine). Information is prepared taking into account the position of the scientific and practical medical society (global, European and Russian) in the relevant specialty. All materials undergo mandatory independent peer review.	Remote access, after registration under the university profile	**http://www.rosmedlib.ru/cgi-bin/mb4x**
EBS "Bookup"	Large medical library-information-educational platform for joint use of electronic textbooks, educational and methodological	Remote access, after registration under the university profile	**https://www.books-up.ru/**

Resource Name	Resource Description	Access	Resource Address
	publications of medical universities in Russia and CIS countries		
EBS "Lan"	Network electronic library of medical universities - electronic database of works of educational and scientific character in medical topics, created with the aim of implementing network forms of professional educational programs, open access to educational materials for partner universities	Remote access, after registration under the university profile	**https://e.lanbook.com/**
Scientific electronic library "CyberLeninka"	CyberLeninka is a scientific electronic library built on the paradigm of open science (Open Science), whose main tasks are to popularize science and scientific activity, public control over the quality of scientific publications, develop interdisciplinary research, a modern institute of scientific peer review, increase the citation of Russian science and build a knowledge infrastructure.	Free access	**https://cyberleninka.ru/**

Resource Name	Resource Description	Access	Resource Address
	Contains over 2.3 million scientific articles.		
Oxford Medicine Online	A collection of publications from Oxford University Press on medical topics, bringing together over 350 titles in a common resource with cross-search capabilities. Publications include The Oxford Handbook of Clinical Medicine and The Oxford Textbook of Medicine, whose electronic versions are constantly updated.	Free access	**http://www.oxfordmedicine.com**
Human Biology Knowledge Base	Reference information on physiology, cell biology, genetics, biochemistry, immunology, pathology. (Resource of the Institute of Molecular Genetics of the Russian Academy of Sciences.)	Free access	**http://humbio.ru/**
Medical online library	Free reference books, encyclopedias, books, monographs, abstracts, English literature, tests.	Free access	**https://www.medlib.ru/library/library/boo**
Information systems			

Resource Name	Resource Description	Access	Resource Address
Rubricator of clinical guidelines	Resource of the Ministry of Health of Russia, which publishes clinical guidelines developed and approved by medical non-profit organizations of the Russian Federation, as well as methodological guidelines, nomenclatures and other reference materials.	Link to download application	**https://cr.minzdrav.gov.ru/#!/**
Federal electronic medical library (FEMB)	The Federal electronic medical library is part of a unified state information system in the field of healthcare as a reference system. FEMB was created on the basis of the funds of the Central Scientific Medical Library named after I.M. Sechenov.	Free access	**https://femb.ru/**
Russian Medical Association	Professional internet resource. Goal: to promote effective professional activity of medical personnel. Contains charter, personalities, structure, rules of admission, information about the Russian Medical Union.	Free access	**http://www.rmass.ru/**

Resource Name	Resource Description	Access	Resource Address
Web-medicine	The site presents a catalog of professional medical resources, including links to the most authoritative thematic sites, journals, societies, as well as useful documents and programs. The site is intended for doctors, students, employees of medical universities and research institutions.	Free access	**http://webmed.irkutsk.ru/**
Databases			
World Health Organization	The site contains news, statistical data by country, included in the World Health Organization, information bulletins, reports, WHO publications and much more.	Free access	**http://www.who.int/ru/**
Ministry of Science and Higher Education of the Russian Federation	The site of the Ministry of Science and Higher Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**http://www.minobrnauki.gov.ru**
Ministry of Education of the Russian Federation	The site of the Ministry of Education of the Russian Federation contains news, information bulletins,	Free access	**https://edu.gov.ru/**

	reports, publications and much more.		
Federal portal "Russian Education"	Single window of access to educational resources. This portal provides access to textbooks on all branches of medicine and healthcare.	Free access	**http://www.edu.ru/**
Polpred.com	Electronic library system Business media. Media review.	Free access	**https://polpred.com/news**
Bibliographic databases			
DB "Russian Medicine"	Created at the Central Scientific Medical Library, covers the entire fund starting from 1988. The database contains bibliographic descriptions of articles from domestic journals and collections, dissertations and their abstracts, as well as domestic and foreign books, collections of works by institutes, conference materials, etc. Thematically, the database covers all areas of medicine and related areas of biology, biophysics, biochemistry, psychology, etc.	Free access	**https://rucml.ru/**
PubMed	Text database of medical and biological publications in English. The PubMed database is an electronic search system with free access to	Free access	**https://pubmed.ncbi.nlm.nih.gov/**

	30 million publications from 4800 indexed medical journals. The database contains articles published from 1960 to the present day, including information from MEDLINE, PreMEDLINE, NLM. Each year, the portal is updated with more than 500 thousand new works.		
eLIBRARY.RU	Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 13 million scientific articles and publications. Electronic versions of more than 2000 Russian scientific and technical journals are available on the eLIBRARY.RU platform, including more than 1000 journals in open access.	Full site functionality available after registration	**http://elibrary.ru/defaultx.asp**
Electronic library of dissertations (RSL)	Currently, the Electronic library of dissertations of the Russian State Library contains over 919,000 full texts of dissertations and abstracts.	Free access	**http://diss.rsl.ru/?menu=disscatalog/**
Medline.ru	Medical and biological portal for specialists. Biomedical journal.	Free access	**https://journal.scbmt.ru/jour/index**

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4.	Kaspersky Endpoint Security for Business – Standard Russian Edition. 50-99 Node 1 year Educational Renewal License	Agreement No. 7 AA dated 07.02.2025
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2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/telemost_mobile_agreement/**
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**

No.	List of freely distributed software	Links to license agreement
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

APPROVED

at the meeting of the Department of Radiation Diagnostics,
Radiation Therapy with an Oncology Course

Protocol No. 9 dated May 26, 2023

Head of Department, Professor, Doctor of Medical Sciences
Gordienko V.P.

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

FOR THE DISCIPLINE "RADIATION DIAGNOSTICS"

SPECIALTY 31.05.01 GENERAL MEDICINE

FOR THE 2023 – 2024 ACADEMIC YEAR

The work program has been supplemented with new software:

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3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/license_CureIt_ru.pdf**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win2021/21.16.6.467/english-0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

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"RADIATION DIAGNOSTICS"

SPECIALTY General Medicine

FOR THE 2024 – 2025 ACADEMIC YEAR

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Electronic Library Systems

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"Student Consultant" Electronic library of a medical university.	For students and teachers of medical and pharmaceutical universities. Provides access to electronic versions of textbooks, manuals and periodicals.	Remote access, after registration under the university profile	**http://www.studmedlib.ru/**
"Doctor Consultant" Electronic medical library.	Materials placed in the library are developed by leading Russian specialists based on modern scientific knowledge (evidence-based medicine). Information is prepared taking into account the position of the scientific and practical medical society (global, European and Russian) in the relevant specialty. All materials undergo mandatory independent peer review.	Remote access, after registration under the university profile	**http://www.rosmedlib.ru/cgi-bin/mb4x**
EBS "Bookup"	Large medical library-information-educational platform for joint use of electronic textbooks, educational and methodological publications of medical universities in Russia and CIS countries	Remote access, after registration under the university profile	**https://www.books-up.ru/**

Resource Name	Resource Description	Access	Resource Address
EBS "Lan"	Network electronic library of medical universities - electronic database of works of educational and scientific character in medical topics, created with the aim of implementing network forms of professional educational programs, open access to educational materials for partner universities	Remote access, after registration under the university profile	**https://e.lanbook.com/**
Scientific electronic library "CyberLeninka"	CyberLeninka is a scientific electronic library built on the paradigm of open science (Open Science), whose main tasks are to popularize science and scientific activity, public control over the quality of scientific publications, develop interdisciplinary research, a modern institute of scientific peer review, increase the citation of Russian science and build a knowledge infrastructure. Contains over 2.3 million scientific articles.	Free access	**https://cyberleninka.ru/**
Oxford Medicine Online	A collection of publications from Oxford University Press on medical topics, bringing together over 350 titles in a common resource with cross-search capabilities. Publications include The Oxford Handbook of Clinical Medicine and The Oxford Textbook of Medicine, whose electronic versions are constantly updated.	Free access	**http://www.oxfordmedicine.com**
Human Biology Knowledge Base	Reference information on physiology, cell biology, genetics, biochemistry, immunology, pathology. (Resource of the Institute of Molecular Genetics of the Russian Academy of Sciences.)	Free access	**http://humbio.ru/**
Medical online library	Free reference books, encyclopedias, books, monographs, abstracts, English literature, tests.	Free access	**https://www.medlib.ru/library/library/books**
Information systems			
Rubricator of clinical	Resource of the Ministry of Health of Russia, which publishes clinical guidelines developed and approved by medical non-profit organizations of the Russian	Link to download application	**https://cr.minzdrav.gov.ru/#!/**

Resource Name	Resource Description	Access	Resource Address
guidelines	Federation, as well as methodological guidelines, nomenclatures and other reference materials.		
Federal electronic medical library (FEMB)	The Federal electronic medical library is part of a unified state information system in the field of healthcare as a reference system. FEMB was created on the basis of the funds of the Central Scientific Medical Library named after I.M. Sechenov.	Free access	**https://femb.ru/**
Russian Medical Association	Professional internet resource. Goal: to promote effective professional activity of medical personnel. Contains charter, personalities, structure, rules of admission, information about the Russian Medical Union.	Free access	**http://www.rmass.ru/**
Web-medicine	The site presents a catalog of professional medical resources, including links to the most authoritative thematic sites, journals, societies, as well as useful documents and programs. The site is intended for doctors, students, employees of medical universities and research institutions.	Free access	**http://webmed.irkutsk.ru/**

Databases			
World Health Organization	The site contains news, statistical data by country, included in the World Health Organization, information bulletins, reports, WHO publications and much more.	Free access	**http://www.who.int/ru/**
Ministry of Science and Higher Education of the Russian Federation	The site of the Ministry of Science and Higher Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**http://www.minobrnauki.gov.ru**
Ministry of Education of the Russian Federation	The site of the Ministry of Education of the Russian Federation contains news, information bulletins, reports, publications and much more.	Free access	**https://edu.gov.ru/**
Federal portal "Russian Education"	Single window of access to educational resources. This portal provides access to textbooks on all branches of medicine and healthcare.	Free access	**http://www.edu.ru/**
Polpred.com	Electronic library system Business media. Media review.	Free access	**https://polpred.com/news**
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	all areas of medicine and related areas of biology, biophysics, biochemistry, psychology, etc.		
PubMed	Text database of medical and biological publications in English. The PubMed database is an electronic search system with free access to 30 million publications from 4800 indexed medical journals. The database contains articles published from 1960 to the present day, including information from MEDLINE, PreMEDLINE, NLM. Each year, the portal is updated with more than 500 thousand new works.	Free access	**https://pubmed.ncbi.nlm.nih.gov/**
eLIBRARY.RU	Russian information portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 13 million scientific articles and publications. Electronic versions of more than 2000 Russian scientific and technical journals are available on the eLIBRARY.RU platform, including more than 1000 journals in open access.	Full site functionality available after registration	**http://elibrary.ru/defaultx.asp**
Electronic library of dissertations (RSL)	Currently, the Electronic library of dissertations of the Russian State Library contains over 919,000 full texts of dissertations and abstracts.	Free access	**http://diss.rsl.ru/?menu=disscatalog/**
Medline.ru	Medical and biological portal for specialists. Biomedical journal.	Free access	**https://journal.scbmt.ru/jour/index**
Official internet portal of legal information	Unified official state information and legal resource in Russia	Free access	**http://pravo.gov.ru/**

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2.	Yandex.Telemost	Free distribution License agreement for the use of programs **https://yandex.ru/legal/te**
3.	Dr.Web CureIt!	Free distribution License agreement: **https://st.drweb.com/static/new-www/files/licen**
4.	OpenOffice	Free distribution License: **http://www.gnu.org/copyleft/lesser.html**
5.	LibreOffice	Free distribution License: **https://ru.libreoffice.org/about-us/license/**
6.	VK Calls	Free distribution **https://vk.com/licence**
7.	Kaspersky Free Antivirus	Free distribution **https://products.s.kaspersky-labs.com/homeuser/Kaspersky4Win 0.207.0/3830343439337c44454c7c4e554c4c/kis_eula_en-in.txt**

APPROVED

at the meeting of the Department of Radiation Diagnostics,
Radiation Therapy with an Oncology Course

Protocol No. ___ dated 10.04.25

Head of Department, Professor, Doctor of Medical Sciences
V.P. Gordienko

ADDITIONS AND AMENDMENTS TO THE WORK PROGRAM

FOR THE DISCIPLINE "RADIATION DIAGNOSTICS"

SPECIALTY GENERAL MEDICINE

FOR THE 2025-2026 ACADEMIC YEAR

3. Update the list of electronic textbooks:

In section 3.1 Main literature:

Radiation diagnostics

- Radiation diagnostics: textbook / edited by G. E. Trufanov. - 3rd ed., revised and supplemented. - Moscow: GEOTAR-Media, 2023. - 484 p. - ISBN 978-5-9704-7916-2. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970479162.html** (accessed: 30.10.2024). - Access mode: by subscription.
- Shamov, I. A. Propaedeutics of internal diseases with elements of radiation diagnostics: textbook / I. A. Shamov. - Moscow: GEOTAR-Media, 2019. - 512 p. - 512 p. - ISBN 978-5-9704-5182-3. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970451823.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Fundamentals of radiation diagnostics: textbook / D. A. Lezhnev, I. V. Ivanova, E. A. Egorova [et al.]. - 2nd ed., supplemented. - Moscow: GEOTAR-Media, 2022. - 128 p. - ISBN 978-5-9704-7267-5. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970472675.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Ilyasova, E. B. Radiation diagnostics: textbook / E. B. Ilyasova, M. L. Chekhonatskaya, V. N. Priezzheva. - 2nd ed., revised and supplemented. - Moscow: GEOTAR-Media, 2021. - 432 p. - ISBN 978-5-9704-5877-8. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970458778.html** (accessed: 07.11.2024). - Access mode: by subscription.

In section 3.2 Additional literature:

- Radiation diagnostics of non-specific purulent-inflammatory diseases of the spine: a guide for doctors / edited by V. A. Manukovsky, V. E. Savello, I. S. Afanasyeva. - Moscow: GEOTAR-Media, 2024. - 128 p. - ISBN 978-5-9704-8418-0, DOI: 10.33029/9704-8418-0-MSA-2024-1-128. - Electronic version available on the EBS "Student Consultant" website: [site]. URL: **https://www.studentlibrary.ru/book/ISBN9785970484180.html** (accessed: 30.10.2024). - Access mode: by subscription. - Text: electronic

- Trufanov, G. E. Computed tomography in the diagnosis of pneumonia. Atlas / edited by G. E. Trufanov, A. S. Grishchenkova. - Moscow: GEOTAR-Media, 2021. - 304 p. - ISBN 978-5-9704-5946-1. - Text: electronic // EBS "Student Consultant": [site]. - URL: **https://www.studentlibrary.ru/book/ISBN9785970459461.html** (accessed: 07.11.2024). - Access mode: by subscription.
- Aleksandrovich A.S. Radiation diagnostics and radiation therapy: textbook for students / A.S. Aleksandrovich, T.V. Semenyuk, E.S. Zaretskaya. - Grodno: GrGMU, 2022. - 428 p. - ISBN 9789855956717. - Text: electronic // EBS "Bookup": [site]. - URL: **https://www.books-up.ru/ru/book/luchevaya-diagnostika-i-luchevaya-terapiya-15716625** Access mode: by subscription.

4. Make changes in section 3.7. Resources of the information and telecommunication network "Internet":

- Electronic address of the Amur State Medical Academy library to be replaced with **https://amurgma.ru/obuchenie/biblioteki/biblioteka-amurskoy-gma/**
- Electronic address of the Electronic library system "Student Consultant" to be replaced with **https://www.studentlibrary.ru**