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MINISTRY OF EDUCATION AND SCIENCE OF RUSSIA

**Federal State Budgetary Educational Institution
of higher education
«I.N. Ulianov Chuvash State University»**
(FSBEI of HE «I.N. Ulianov Chuvash State University»)

Medical Faculty

Department of Propaedeutics of Internal Diseases with a course of radiation dianostics

«APPROVE»
Vice-rector for Academic Affairs
__________________ I.E. Poverinov

«_13_» _04_______ 2022

Working programs of the discipline (module)
«Лучевая диагностика / Diagnostic Radiology»

Direction of training / specialty 31.05.03 Стоматология / Dentistry
Graduate's qualification Врач-стоматолог / Dental Practitioner

Direction (profile) / specialization «Dentistry»

Form of training – очная / intramural
Course – 3
Term – 5, 6
Total academic hours/credit points – 180/5
The year of beginning the training – 2022

Cheboksary - 2022

The fundamental document for compiling the working program of the discipline (module) Федеральный государственный образовательный стандарт высшего образования - специалитет по специальности 31.05.03 Стоматология (приказ Минобрнауки России от 12.08.2020 г. № 984)

Approved by:
Professor, Doctor of Medical Sciences L.A. Timofeeva

The working program was approved at the meeting of the Department of Propaedeutics of Internal Diseases with a course of radiation dianostics,
25.03.2022, protocol №7
Head of the department V.N. Diomidova

Approved by
Dean of the Medical Faculty V.N. Diomidova
Acting Head of the Educational and Methodological Department E.A. Shirmanova

1. The purpose and objectives of training in the discipline (module)

The purpose of the discipline - have an idea about the physical and biological foundations, patterns and features of obtaining diagnostic images; to teach students to select an algorithm for examining a patient using radiation methods for diagnosing diseases; properly prepare the patient for examination and clinically interpret the results; prepare a future doctor with clinical thinking, a high general culture, able to navigate and work in modern technical conditions.

The objectives of the discipline - to familiarize students with modern methods and equipment for radiation diagnostics (RD);

to form an understanding of reading the conclusions of radiation diagnostic methods;

on the basis of the anamnesis and clinical picture of the disease, determine the indications and contraindications for a particular radiation study;

issue a referral of the patient to a radiation diagnostician or a radiation therapist and prepare the patient for radiation examination or treatment;

to teach how to select the optimal variant of the LD algorithm for making a clinical diagnosis and determining the severity of the pathological process;

together with the doctor - radiation diagnostician, outline the volume and sequence of radiation studies (X-ray, ultrasound, radionuclide, etc.);

independently identify the image of all human organs and indicate their main anatomical structures on radiographs, angiograms, computer x-ray and magnetic resonance tomograms, ultrasound scans, scintigrams;

acquire the necessary amount of theoretical knowledge and skills necessary for a future doctor of any specialty to provide highly qualified assistance.

2. The place of practical training in the structure of the educational program of higher education

The discipline «Лучевая диагностика / Diagnostic Radiology» относится к части учебного плана формируемой участниками образовательных отношений refers to the mandatory part in the curriculum of the educational program of higher education (hereinafter referred to as the EP of HE) in the field of training / specialty 31.05.03 Стоматология, direction (profile) / specialization of the program «Dentistry».

Previous academic disciplines (modules) and (or) practices that form the knowledge, skills and abilities necessary for training in the discipline (module):

Внутренние болезни / Internal Diseases

Пропедевтическая стоматология / Propaedeutic Dentistry

Knowledge, skills and abilities formed as a result of training in a discipline (module) are necessary when teaching in the following disciplines (modules) and (or) practices:

Общая хирургия / General Surgery

Терапевтическая стоматология / Therapeutic Dentistry

Производственная практика (практика по получению профессиональных умений и опыта профессиональной деятельности (по ортопедической стоматологии)) / On-the- job training (practical training in obtaining professional skills and professional experience (in orthopedic dentistry))

Производственная практика (практика по получению профессиональных умений и опыта профессиональной деятельности (по терапевтической стоматологии)) / On-the- job training (practical training in obtaining professional skills and professional experience (in therapeutic dentistry))

Производственная практика (практика по получению профессиональных умений и опыта профессиональной деятельности (по профилактической стоматологии)) / On- the-job training (practical training in obtaining professional skills and professional experience (in surgical dentistry))

Подготовка к сдаче и сдача государственного экзамена / Preparation for passing and passing the state exam

3. Planned learning outcomes in the discipline (module), correlated with the planned learning outcomes

Planned learning outcomes in the discipline (module), correlated with the planned learning outcomes

Code and name of the competence	Code and name of the competence achievement	Descriptors for the indicator of competence achievement (learning)
ПК-1 Способен провести обследования пациента с целью установления диагноза / He/she is able to perform a patient's examination in order to make a diagnosis	ПК-1.1 Способен провести физикальное обследования пациента (сбор жалоб и анамнеза, осмотр, пальпация, перкуссия) / He/she is able to conduct a patient's physical examination (taking a history, inspection, palpation, percussion)	Methodology for collecting and evaluating health data (hereditary and chronic diseases). The method of collecting and evaluating the patient's life history. The methodology for obtaining and evaluating information about past illnesses and surgical interventions (what and at what age). The methodology for collecting and assessing the history of the disease (complaints, the timing of the onset of the disease, the timing of the first and repeated visits, the therapy). The method of assessing the condition and well-being of the patient, examining and evaluating the skin, the severity of subcutaneous fat, nails, hair, visible mucous membranes, lymph nodes, organs and systems of the body. Get information about the presence of hereditary and chronic diseases. Get information about the patient's life history Receive information about complaints, the timing of the onset of the disease, the timing of the first and repeated treatment, the therapy performed. Assess the condition and well- being of the patient, examine and evaluate the skin, the severity of

		subcutaneous fat, nails, hair, visible mucous membranes, lymph nodes, organs and systems of the patient's body. Obtaining patient data. Taking a patient history. Obtaining information about past illnesses and surgical interventions (which ones and at what age). Gathering an anamnesis of the disease.
ПК-1 Способен провести обследования пациента с целью установления диагноза / He/she is able to perform a patient’s examination in order to make a diagnosis	ПК-1.2 Способен анализировать информацию, полученную при проведении физикального обследования, дополнительных методов исследования, сформулировать предварительный диагноз / He/she is able to analyze the information obtained during the physical examination, additional examination methods, formulate a preliminary diagnosis	Conduct physical examinations and interpret their results Interpret the results of the initial examination of patients Justify the need and scope of instrumental research Conduct a general clinical examination of children and adults Justify the need to refer patients for consultation with specialists Basic principles for diagnosing infectious diseases, medical indications for hospitalization of patients with infectious diseases Etiology, pathogenesis, diagnosis of common diseases Establishing a preliminary diagnosis. Referral of patients for instrumental examinations. Referring patients for consultation to specialist doctors. Interpretation of the data of the primary examination of patients. Interpreting the results of collecting information from patients (their relatives/legal representatives)
ПК-1 Способен провести обследования пациента с целью установления диагноза / He/she is able to perform a patient’s examination in order to make a diagnosis	ПК-1.3 Способен сформулировать диагноз на основании полученной информации / He/she is able to formulate a preliminary diagnosis on the basis of information obtained	Interpret the results of re-examination of patients. Analyze the results of the survey. Justify and plan the scope of additional research. Interpret the results of collecting information from patients (their relatives/legal representatives). Interpret the data of instrumental studies. Interpret the data of consultations

		of patients by medical specialists. Interpret according to the international statistical classification of diseases and related health problems Development of an algorithm for making a final diagnosis Making a final diagnosis. Interpretation of laboratory data Interpretation of patient consultation data by medical specialists

4. Structure, scope and content of the discipline (module)

Educational activities in the discipline (module) are carried out:

- in the form of students' face-to-face work with the teaching staff of the organization and (or) persons involved by the organization to implement the educational programs on other terms (hereinafter - contact work);

- in the form of students' independent work.

Face-to-face work can be classroom-based, extramural, as well as it can be conducted in an electronic information and educational environment (EIEE).

Learning sessions in the discipline (module) and interim assessment of students are conducted in the form of face-to-face work and in the form of students' independent work.

During learning sessions in the discipline (module) face-to-face work includes: lecture-type classes, seminar-type classes and (or) group consultations, and (or) individual work of students with the teaching staff of the organization and (or) persons involved by the organization to implement the educational programs on other terms (including individual consultations).

Legend:

Lec – lectures, Lab – laboratory work, Pr – practical classes, ICW – individual face-to-face work, IW – independent work.

4.1. Content of the discipline (module)

Section name	The section's content	Formed competences	Competence achievement indicator
Section 2. Radiation symptoms and lung damage syndromes	Radiation symptoms and lung damage syndromes.	ПК-1	ПК-1.1, ПК-1.2, ПК-1.3
Section 1. General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.	General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.		ПК-1.1, ПК-1.2
Section 3. Radiation diagnostics of diseases of the mediastinal organs.	Radiation diagnostics of diseases of the mediastinal organs.		
Section 4. Radiation	Radiation diagnosis of		

diagnostics of diseases of the mammary glands.	diseases of the mammary glands.		
Section 5. Radiation diagnostics of diseases of the endocrine system	Radiation diagnostics of diseases of the endocrine system.	ПК-1	ПК-1.1, ПК-1.2
Section 6. Radiation diagnostics of the urinary system organs in normal and pathological conditions	Radiation diagnostics of the urinary system organs in normal and pathological conditions		
Section 8. Radiation diagnostics of diseases of the hepatobiliary system and the pancreato–duodenal zone	Complex radiation diagnostics of diseases of the hepatobiliary system and the pancreatoduodenal zone.		
Section 7. Radiation diagnostics of digestive organs in normal and pathological conditions	Radiation diagnostics of digestive organs in normal and pathological conditions		
Section 9. Radiation diagnostics of the osteoarticular system	Radiation diagnostics of injuries and diseases of the osteoarticular system		
	Radiation diagnostics of injuries and diseases of the osteoarticular system		
Section 10. Radiation diagnostics in neurology	Radiation diagnostics in neurology		
Section 11. Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions	Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions.		
	Radiation diagnostics of teeth, maxillofacial		

4.2. Scope of the discipline and types of academic work

Forms of control and types of academic work	Labor intensity of the discipline (module)		
	5	6	total
1. Face-to-face work:	32	32,3	64,3
In-class learning in total, including:	32	32	64

Лекционные занятия (Лек)	16		16
Лабораторные занятия (Лаб)	16	32	48
Индивидуальная контактная работа (ИКР)		0,3	0,3
2. Independent work of the student:	40	39,7	79,7
3. Intermediate certification (exam) (экзамен)		Эк	
Total: academic hours	72	108	180
Total: credit units	2	3	5

№ item	The section's (theme's) name	Face-to face work, including in the electronic information and educational environment, academic hours				IW, academic hours	Total, academic hours
		Lect.	Pr.	Lab.	ICW		
	Section 2. Radiation symptoms and lung damage syndromes						
1	Radiation symptoms and lung damage syndromes.	2		6		6	14
	Section 1. General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.						
2	General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.	4		2		8	14
	Section 3. Radiation diagnostics of diseases of the mediastinal organs.						
3	Radiation diagnostics of diseases of the mediastinal organs.			4		6	10
	Section 4. Radiation diagnostics of diseases of the mammary glands.						
4	Radiation diagnosis of diseases of the mammary glands.					4	4
	Section 5. Radiation diagnostics of diseases of the endocrine system						

5	Radiation diagnostics of diseases of the endocrine system.					4	4
	Section 6. Radiation diagnostics of the urinary system organs in normal and pathological conditions						
6	Radiation diagnostics of the urinary system organs in normal and pathological conditions	2		2		4	8
	Section 8. Radiation diagnostics of diseases of the hepatobiliary system and the pancreato–duodenal zone						
7	Complex radiation diagnostics of diseases of the hepatobiliary system and the pancreatoduodenal zone.					4	4
	Section 7. Radiation diagnostics of digestive organs in normal and pathological conditions						
8	Radiation diagnostics of digestive organs in normal and pathological conditions	2		2		4	8
	Section 9. Radiation diagnostics of the osteoarticular system						
9	Radiation diagnostics of injuries and diseases of the osteoarticular system	2					2
10	Radiation diagnostics of injuries and diseases of the osteoarticular system			8		10	18
	Section 10. Radiation diagnostics in neurology						
11	Radiation diagnostics in neurology			4		9	13
	Section 11. Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions						
12	Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions.	4					4
13	Radiation diagnostics of teeth, maxillofacial			20	0,3	20,7	41

Total academic hours	16		48	0,3	79,7	180

4.3. Summary of the discipline (module), structured by sections (topics)

Раздел 1. Section 2. Radiation symptoms and lung damage syndromes
Тема 1. Radiation symptoms and lung damage syndromes.

Лекционное занятие. Lecture 3

Lungs and heart in the beam image. Methods of radiation examination of the lungs, heart. Radiation anatomy of the lungs, heart (X-ray examination. The use of computer and magnetic resonance imaging, radionuclide studies, ultrasound studies). Multispiral coronarography. Radiation signs of acute pneumonia. Chronic bronchitis. Chronic pneumonia, emphysema of the lungs. Pneumosclerosis, pneumoconiosis, pleurisy. Tuberculosis. . Emergency radiotherapy in intensive care units, blocks and intensive care wards. Radiation diagnostics of foreign bodies. Signs of emergency conditions on radiographs of the thoracic and abdominal cavities (pneumothorax, hydrothorax, acute pneumonia, damage to the trachea and bronchi.

Лабораторное занятие. Laboratory lesson 2.

Radiation diagnosis of lung diseases. Radiation anatomy and physiology of the lungs. Methods of radiation examination of the lungs (radiography and fluorography, X-ray, CT and MRI, sonography, angiopulmonography, scintigraphy). Detailed examination of chest X-rays. The plan of reading the overview and lateral radiographs of the OGK.

Radiation symptoms and lung damage syndromes. Identification of the main indicators of pulmonary pathology: extensive and limited darkening or enlightenment of the pulmonary field or its part. Radiation signs of acute pneumonia. Chronic pneumonia, emphysema of the lungs. Pleurisy. The main forms of tuberculosis, cirrhosis and atelectasis of the lungs. Fibrothorax.

Лабораторное занятие. Laboratory lesson 3.

Radiation symptoms and lung damage syndromes. Radiation diagnosis of lung diseases. Round and ring-shaped shadow syndrome. Radiation signs of central and peripheral cancer. Benign lung tumors. Malignant primary and secondary (metastatic) lung tumors. Radiation pattern of infiltrative lesions of lung tissue. Lung abscess, pleural empyema. An air cyst and a sanitized tuberculous cavity.

Radiation symptoms and syndromes of foci and limited dissemination and diffuse dissemination of lung lesions. Radiation diagnosis of lung diseases. Radiation signs of focal pneumonia, disseminated forms of tuberculosis. Pneumoconiosis, nodular silicosis. Pulmonary edema.

Лабораторное занятие. Laboratory lesson 4.

Radiation diagnosis of syndromes of pathological changes in the pulmonary pattern and changes in the root of the lung, bronchial lymph nodes. Radiation signs of mediastinal lymphadenopathy in inflammatory and tumor lesions and blood diseases. Volumetric formations in the mediastinum. Radiation pattern of bronchial patency disorders, blood circulation and fluid exchange in the lungs.

Analysis and logging of chest X-rays according to the syndrome in normal and pathological conditions.

Раздел 2. Section 1. General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.
Тема 2. General issues of radiation diagnostics. Organization of work of radiology diagnostics departments. Principles of anti-radiation protection.

Лекционное занятие. Lecture 1

Radiation diagnostics. Methods and means of radiation diagnostics. Radiation diagnostics is an integral part of medical radiology. Her role in the system of pre-graduate training of a general practitioner. A brief history of medical radiology, the contribution of Russian scientists to its development.

Methods and means of radiation diagnostics - types of electromagnetic, ultrasonic and corpuscular fields used in radiation diagnostics. Principles of radiation protection and occupational safety measures in the diagnostic use of radiation. Regulation of radiation diagnostic tests.

The main methods of obtaining images for medical diagnostics (X-ray, ultrasound, radionuclide, magnetic resonance, thermographic). Visual image analysis. Computer processing of medical images.

X-ray research method (radiation source, object of study, radiation receiver). Artificial contrast of the object of study. The principle of obtaining images. Oi

Лекционное занятие. Lecture 2

Magnetic resonance imaging. The principle of image acquisition. Contraindications to the use of the method. Diagnostic capabilities of the method. Magnetic resonance spectroscopy.

Principles of ultrasound diagnostic examination. Methods of ultrasound examination – one-dimensional echography, ultrasound scanning (sonography), Dopplerography, duplex sonography. Visualization of organs and tissues on sonograms. Puncture of organs and pathological formations under the control of ultrasound and computed tomography.

Principles of radionuclide diagnostic studies. Radiopharmaceuticals. Radionuclide research methods - clinical and laboratory radiometry, radiography, radionuclide imaging (scanning, scintigraphy, single-photon and positron emission tomography). Radionuclide diagnostic laboratory. Clinical radiological biochemistry. Principles of radioimmunological research. Radiation methods of activation a

Лабораторное занятие. Laboratory lesson 1

Organization of work of the department of radiation diagnostics. Acquaintance with the department of radiation diagnostics. Principles of anti-radiation protection. Basic, additional and special radiation research methods. Acquaintance with the darkroom, photo processing (development, fixing, washing and drying) of radiographs. Participation in the examination of patients in the offices of radiation diagnostics. Clinical analysis followed by radiation examination of the patient.

Раздел 3. Section 3. Radiation diagnostics of diseases of the mediastinal organs.

Тема 3. Radiation diagnostics of diseases of the mediastinal organs.

Лабораторное занятие. Laboratory lesson 5.

Radiation diagnostics of diseases of the mediastinal organs. Radiation anatomy and physiology of the heart and blood vessels. Methods of radiation diagnostics: ultrasound, X- ray, radionuclide, CT and MRI methods of examination of the heart and blood vessels, the main radiation symptoms. Radiological signs of mitral, aortic and trapezoidal heart configurations. Radiological syndromes of heart and vascular diseases. Algorithms of differential X-ray diagnostics for cardiac pathology syndromes.

Radiation diagnosis of heart diseases. Anomalies of the development of the heart, aorta, pulmonary artery, large veins of the thoracic cavity. Heart defects. Coronary heart disease, myocardial infarction, heart aneurysm. Pericarditis (effusion, adhesive, constrictive). Pulmonary embolism, aortic aneurysm. Thrombophlebitis, varicose veins.

Лабораторное занятие. Laboratory lesson 6.

Study of algorithms for differential X-ray diagnostics of diseases of various syndromes of pathology of lung tissue and mediastinum. Analysis and logging of chest X- rays according to the syndrome in normal and pathological conditions.

Раздел 6. Section 6. Radiation diagnostics of the urinary system organs in normal and

pathological conditions

Тема 6. Radiation diagnostics of the urinary system organs in normal and pathological conditions

Лекционное занятие. Lecture 4

Radiation diagnostics of diseases of the urinary system. Normal radiation anatomy of the urinary system organs. Methods of radiation diagnostics of the kidneys, ureters, and bladder. The main radiological syndromes and symptoms in urology. Tactics of radiation examination in renal colic, macrohematuria, inflammatory diseases of the urinary system.

Лабораторное занятие. Laboratory lesson 7.

Complex radiation diagnostics in urology. Radiation anatomy and physiology of the kidneys and urinary tract. Methods of radiation diagnostics in urology (ultrasound, radiography, CT, MRI, radionuclide scintigraphy).

Radiation diagnostics of diseases of the urinary system. Radiation signs of urolithiasis, inflammatory diseases, hydronephrosis, tumors, cysts, kidney abscess. Abnormalities of the kidneys, ureters, bladder and urethra. Violation of urodynamics, hypertension of renal genesis.

Раздел 8. Section 7. Radiation diagnostics of digestive organs in normal and pathological conditions

Тема 8. Radiation diagnostics of digestive organs in normal and pathological conditions

Лекционное занятие. Lecture 5

Radiation diagnostics of diseases of the gastrointestinal tract. Methods of radiation diagnostics of the esophagus, stomach, duodenum, small intestine, large intestine. Radiation anatomy of the gastrointestinal tract. Age features. The main radiological syndromes and symptoms of gastrointestinal diseases. Signs of emergency conditions in diseases of the abdominal cavity (perforation, acute intestinal obstruction). Radiation signs of gastrointestinal diseases.

Лабораторное занятие. Laboratory lesson 8.

Radiation diagnostics of diseases of the gastrointestinal tract. Radiation anatomy of the esophagus, stomach, duodenum, small intestine, large intestine. Methods of radiation and instrumental examination (X-ray, ultrasound, radionuclide, CT, MRI, endoscopy). The main radiological syndromes of diseases of the digestive canal. Radiation symptoms of gastrointestinal tract damage.

Radiation signs of gastrointestinal diseases. Hernia of the esophageal orifice of the diaphragm. Foreign bodies of the pharynx and esophagus. Diseases of the esophagus (cancer, diverticulum, achalasia, burn). Peptic ulcer disease and its complications. Polyps and polyposis. Benign and malignant tumors. Adhesive disease. Mechanical and dynamic obstruction of the small intestine. Diverticulosis, diverticulitis. Polyps and polyposis. Mechanical and dynamic obstruction of the colon. Benign and malignant tumors. Algorithms of differential X-ray diagnostics of the most important gastrointestinal diseases. Emergency radiotherapy for acute mechanical intestinal obstruction, rupture of a hollow organ in the abdominal cavity, ascites).

Раздел 9. Section 9. Radiation diagnostics of the osteoarticular system

Тема 9. Radiation diagnostics of injuries and diseases of the osteoarticular system

Лекционное занятие. Lecture 6

Radiation diagnostics of traumatic injuries and diseases of the osteoarticular system. Radiation signs of traumatic injuries (fractures, dislocations) of bones and joints. Radiation signs of osteomyelitis, tuberculosis, benign and malignant tumors. Radiation manifestations of degenerative-dystrophic lesions of the osteoarticular system.

Radiation pattern of skull and spine injuries, cerebral blood flow disorders (ischemic and hemorrhagic strokes), hypertension syndrome, brain and spinal cord tumors. Vertebrogenic pain syndrome.

Тема 10. Radiation diagnostics of injuries and diseases of the osteoarticular system

Лабораторное занятие. Age features. Radiation semiotics of diseases of the osteoarticular apparatus. Skeletal injuries and their consequences. Tactics of radiation examination in case of injuries. Types of fractures and dislocations of bones. Features of injuries in childhood and old age. Radiation semiotics of bone, joint and soft tissue injuries. Reposition of bone fragments. Healing of bone fractures in the X-ray image, healing disorders (excessive bone callus, delayed consolidation, formation of a false joint).

Лабораторное занятие. Laboratory lesson 10

Radiation diagnostics of diseases of the osteoarticular system. Osteomyelitis, arthritis, spondylitis. Tuberculosis of bones and joints. Dystrophic lesions. Skeletal changes in endocrine diseases and diseases of the blood system. Benign tumors of bones, joints and soft tissues. Malignant tumors of the musculoskeletal system. Radiation detection and radiation pattern of metastases of malignant tumors in the skeleton.

Раздел 10. Section 10. Radiation diagnostics in neurology

Тема 11. Radiation diagnostics in neurology

Лабораторное занятие. Laboratory lesson 11.

Radiation diagnostics in neurology. Radiation anatomy of the skull, spine, brain and spinal cord. Methods of radiation diagnostics in diseases of the brain and spinal cord (MRI, CT). Radiation pattern of skull and spine injuries, cerebral blood flow disorders (ischemic and hemorrhagic strokes), hypertension syndrome, brain and spinal cord tumors. Vertebrogenic pain syndrome. Inflammatory, traumatic, degenerative-dystrophic diseases. Herniated intervertebral discs.

Раздел 11. Section 11. Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions

Тема 12. Radiation diagnostics of teeth, maxillofacial area, salivary glands in normal and pathological conditions.

Лекционное занятие. Lecture 7.

Radiological methods of examination of teeth and maxillofacial area. Intraoral contact radiography, interproximal radiography, extra-oral radiography. Tomography, panoramic tomography.

Лекционное занятие. Lecture 8.

Complex radiation diagnostics of dental and maxillofacial diseases. Radiation diagnostics of anomalies, injuries, caries, pulpitis, periodontitis, periodontal disease, inflammatory diseases, cysts, benign and malignant tumors of the maxillary region. Radiation signs of ultrasound, radionuclide, CT examination in the diagnosis of diseases of the salivary glands, submandibular region and paranasal sinuses.

Тема 13. Radiation diagnostics of teeth, maxillofacial

Лабораторное занятие. Laboratory lesson 12.

Normal X-ray anatomy of teeth and jaws. Radiological methods of examination of teeth and maxillofacial area. Intraoral contact X-ray, intraproximal radiography, extraoral radiography. Tomography, panoramic tomography.

Лабораторное занятие. Laboratory lesson 13.

Complex radiation diagnostics of inflammatory diseases of the teeth and maxillofacial region, salivary glands Radiation diagnostics of caries, pulpitis, periodontitis, periodontal disease, inflammatory diseases of the jaws. Osteomyelitis. Os-theomyelitis in children. Odontogenic sinusitis. Hematogenous osteomyelitis of the upper and lower jaws. Radiation diagnostics of diseases of the temporomandibular joint. De-forming osteoarthritis. Arthritis of the temporomandibular joint. Radiation signs of inflammation of the salivary glands and paranasal sinuses.

Лабораторное занятие. Laboratory lesson 14.

Radiation diagnostics of traumatic injuries of the maxillofacial region. Radiation signs (X-ray, computed tomography) of traumatic injuries of the maxillofacial region. Fractures of the lower jaw. Fractures of the upper jaw. the zygomatic bone. Fusion of fractures. Complications of fracture fusion. Dislocation of the lower jaw. Dislocations and fractures of teeth, radiological signs.

Лабораторное занятие. Laboratory lesson 15.

Radiation diagnostics of cysts, benign and malignant formations of the maxillofacial region. Follicular and radicular cysts. Odontogenic and non-odontogenic fissural cysts and nasolabial cyst. Odontogenic and non-odontogenic tumors. Epithelial and connective tissue tumors.

Лабораторное занятие. Laboratory lesson 13.

Features of radiation examination of dental patients. Detailed study of radiographs for intraoral contact radiography, interproxial radiography, extraoral radiography for various diseases of the maxillofacial region. A plan for studying radiographs in dentistry.

5. Educational technologies

To implement the competence-based approach in the study of the discipline (module), extensive use of active and interactive methods of conducting classes in the educational process is provided:

6. Forms of control and types of evaluation materials for the discipline (module)

Intermediate attestation - evaluation of intermediate and final results of training in the discipline (module).

6.1. Sample list of questions for the credit test

не предусмотрено

6.2. Sample list of questions for the examination

1. Radiation diagnostics. Methods of radiation diagnostics. General and fundamental differences between the methods of radiation diagnostics.
2. X-ray radiation, definition, types. Basic properties of X-ray radiation.
3. X-ray examination system. The principle of operation of an X-ray tube. Generation of x-rays.
4. X-ray diagnostic rooms: equipment, cabinet design, negatoscopes. Principles of radiation protection honey. staff and patients.
5. The main methods of X-ray examination (fluoroscopy, radiography). Methodology. Advantages and disadvantages.
6. Nuclear medicine - as a method of radiation diagnostics. The main advantages and disadvantages of radionuclide diagnostics. Scheme of the gamma camera device.
7. Non-ionizing methods of radiation diagnostics (ultrasound, MRI). Generation of ultrasonic waves. The phenomenon of magnetic nuclear resonance.
8. The concept of radiation dose, units of its measurement. Radiation exposure during film radiography, fluoroscopy, computed tomography. Rationing of radiation exposure.
9. Ultrasound examination. The principle of operation of the ultrasonic system. Modern ultrasonic technologies.

10. Computed tomography. How a CT scanner works. Spiral computed tomography (SCT), multislice CT. Areas of use.

11. Radiography. Film and digital radiography. X-ray options (survey, sighting, contrast). Indications and contraindications.

12. The concept of linear x-ray tomography. CT scan. Magnetic resonance imaging. Advantages and disadvantages. Indications and contraindications.

13. Fluorography. Film and digital fluorography. The principle of operation of the fluorographic apparatus. Scope in the study of organs and systems. Advantages and disadvantages.

14. Multislice X-ray computed tomography, its possibilities. Radiation exposure in MSCT. Application of MSCT in pulmonology.

15. Angiography - as a method of interventional radiology. General and selective angiography in urology. Features of the conduct. Indications for angiography in urological practice.

16. Radionuclide research method. The concept of the study "in vivo" and "in vitro". The use of radiopharmaceuticals. Indications and contraindications.

17. The concept of artificial contrasting in radiology. Types of contrast agents, ways of their administration. General indications and contraindications.

18. Radionuclide research method: single photon emission tomography (SPET). How a gamma camera works.

19. Radionuclide research method: positron emission tomography (PET). Methodology. Indications and contraindications. Advantages and disadvantages.

20. Diagnostic and therapeutic interventions under ultrasound guidance. Indications and contraindications. Application area.

21. Magnetic resonance method (MRI) research. The principle of operation of MRI - tomography. Methodology. The use of contrast agents in MRI.

22. The concept of ultrasound modes: 2D, 3D / 4D, color Doppler mapping, power Dopplerography, elastography.

23. Natural contrast of organs and tissues. Benefits of artificial contrast in CT. Features of intravascular use of contrast agents in CT. Contraindications to the use of contrast agents.

24. Magnetic resonance imaging (MRI). Advantages and disadvantages. Indications and contraindications.

25. Bronchography. Methodology. Indications and contraindications. Advantages and disadvantages.

26. Osteodensitometry. Methodology. Indications and contraindications. Advantages and disadvantages.

27. Irrigography. Methodology. Phases of contrasting in irrigography. Indications and contraindications.

28. Oral contrasting of the digestive canal. Indications and contraindications. Advantages and disadvantages.

29. Methods of radiation diagnostics in the study of the functional state of the kidneys (excretory urography, scintigraphy). Methodology. Indications and contraindications. Advantages and disadvantages.

30. Methods of radiation diagnostics in the study of the urinary tract. Retrograde urography. Cystography. Methodology. Indications and contraindications. Advantages and disadvantages.

31. Interventional radiology. Concept. Kinds. Puncture biopsy under X-ray, ultrasound, CT control.

32. Plain radiography of the abdominal organs. Methodology. Indications and contraindications. Advantages and disadvantages.

33. Syndrome of "total darkening of the pulmonary field". Anatomical substratum of

the pulmonary field obscuration. Differential diagnosis of diseases (conditions) in which the syndrome of "total darkening of the pulmonary field" occurs.

34. Syndrome of "limited darkening of the lung field". Anatomical substratum of the pulmonary field obscuration. Differential diagnosis of diseases (conditions) in which the syndrome of "limited darkening of the lung field" occurs.

35. Syndrome of "extensive enlightenment of the lung field". Anatomical substrate of enlightenment. Differential diagnosis of diseases (conditions) in which the syndrome of "extensive enlightenment of the lung field" occurs.

36. Syndrome of "round shadow in the lung field". Definition, causes, x-ray picture. Differential diagnosis of diseases (conditions) in which the syndrome of "round shadow in the lung field" occurs

37. Syndrome of "annular shadow in the lung field". Definition, causes, x-ray picture. Differential diagnosis of diseases (conditions) in which the syndrome of "annular shadow shadow in the lung field" occurs

38. Syndrome of "foci" in the lung field. Differential diagnosis of diseases accompanied by the formation of foci in the lung field (X-ray signs of foci in the lung field).

39. Radiation diagnosis of the syndrome of "dissemination of foci" in the lung field. Definition. Causes of the syndrome of "dissemination of foci" in the lung field.

40. X-ray anatomy of the lung root is normal. Radiation diagnosis in the pathology of the root of the lung. Causes of changes in the lung root ("stagnant root", root infiltration, enlarged lymph nodes in the root, cicatricial deformity of the lung root, etc.).

41. X-ray anatomy of the pulmonary pattern is normal. Radiation diagnosis in the pathology of the pulmonary pattern. A symptom of a change in the lung pattern (depletion, amplification, deformation) on the radiograph. Signs. The reasons.

42. Algorithm for radiodiagnosis in chest injuries. X-ray signs of pneumothorax.

43. The main radiographic signs of mitral heart disease (stenosis, insufficiency and their combination). Differential radiodiagnosis of diseases.

44. Main radiographic signs of aortic heart disease (stenosis, insufficiency and their combination). Differential radiodiagnosis of diseases.

45. The main radiological signs of a trapezoid configuration of the heart. Differential radiodiagnosis of diseases.

46. The main radiographic symptoms and syndromes of diseases of the digestive tract.

47. The main radiological syndromes of the pathology of the esophagus. Algorithm for radiological diagnosis in esophageal cancer. The main radiological signs of diverticulum, achalasia and cancer of the esophagus of the esophagus.

48. The main radiological syndromes of the pathology of the stomach. Algorithm for radiodiagnosis in peptic ulcer of the stomach and duodenum. The main radiation symptoms of stomach ulcers. Possibilities of ultrasound in the detection of early forms of gastric cancer.

49. Algorithm of radiation diagnostics for perforated ulcer of the stomach and duodenum. X-ray signs of a perforated ulcer.

50. Algorithm for radiation diagnosis of stomach cancer. radiological signs. The role of ultrasound, magnetic resonance imaging in the diagnosis of gastric cancer.

51. Algorithm of radiation diagnostics in acute surgical pathology. Leading radiological research methods. The role of ultrasound and X-ray studies in the detection of acute surgical pathology of the abdominal organs.

52. Tactics of radiation diagnostics in case of suspected presence of foreign bodies in hollow organs (esophagus, stomach, bronchi, etc.).

53. Main X-ray syndromes of intestinal pathology. Algorithm for radiodiagnostics in the study of the small and large intestines.

54. Syndrome of inflammatory diseases of the urinary system (IMS). Radiation diagnostic algorithm for inflammatory diseases of the kidneys and urinary tract. The main ultrasound and radiological signs of inflammatory diseases of the kidneys.

55. Syndrome of urolithiasis (ICD). The main ultrasonic and radiographic signs of calculi, types of calculi. Complication of ICD.

56. Algorithm for radiodiagnosis in renal colic. Indications and contraindications. Advantages and disadvantages.

57. Kidney cyst syndrome. Radiation diagnostic algorithm for kidney cysts. The main ultrasound and radiological signs of cysts and polycystic kidney disease.

58. Syndrome of anomalies in the development of the urinary system. Algorithm for radiodiagnosis in doubling the pyelocaliceal system, kidney dystopia, nephroptosis. Basic radiation signs.

59. Syndrome of tumors of the urinary system. Radiation diagnostic algorithm for kidney tumors. The main ultrasound and radiographic signs of kidney tumors.

60. Algorithm for radiodiagnosis in breast pathology. Advantages and disadvantages of research methods. Indications and contraindications.

61. Algorithm of radiation diagnostics in diseases of the thyroid gland. Advantages and disadvantages of research methods. Indications and contraindications.

62. Ultrasound in the pathology of the liver and biliary tract. Preparation for the study. Indications and contraindications.

63. Ultrasound of the pancreas. Preparation for the study. Indications and contraindications.

64. Algorithm of radiation diagnostics for suspected stroke. Indications and contraindications of methods.

65. The main radiological symptoms of the pathology of the osteoarticular system. radiological signs.

66. The main radiological syndromes of the pathology of the osteoarticular system. radiological signs.

67. Syndrome of traumatic injuries and their consequences. Fracture of bones. Types of fractures. Direct and indirect radiological signs of bone fracture. X-ray stages of healing of a bone fracture. X-ray signs of a false joint.

68. Syndrome of inflammatory diseases of bones and joints. The role of radiological research methods in the diagnosis of inflammatory lesions of the bone. The main radiological signs of osteomyelitis.

69. Syndrome of degenerative-dystrophic diseases of the osteoarticular system. The main radiological signs of osteochondrosis of the spine.

70. Radiation diagnostic algorithm for arthritis and arthrosis. radiological signs. The place of ultrasound, magnetic resonance imaging in the detection of arthritis.

71. Syndrome of benign and malignant tumors of the osteoarticular system. Methods of radiation diagnostics in bone tumors. The main radiological signs of malignant and benign bone tumors.

72. Tactics of X-ray examination in trauma of the skull. Algorithm of radiation diagnostics in diseases of the brain. Radiation signs of injuries of the skull and brain.

73. Indications for bite examination in adults and children. Methods of intraoral radiography. Ways to reduce radiation exposure

74. Special methods used in dentistry. Conducting methods. Indications and contraindications.

75. Are the main radiographic techniques used to examine the temporomandibular joint? Conducting methods. Indications and contraindications.

76. Intraoral contact radiography, occlusal intraoral radiography. Features of the methods. Conducting methods. Indications and contraindications.

77. Orthopantomography. Features of the resulting image. Conducting methods.

Indications and contraindications.

78. Possibilities of the method of ultrasound diagnostics in the study of the maxillofacial region. Conducting methods. Indications and contraindications.

79. Possibilities of radiation diagnostics of diseases of the salivary glands. Radiation signs of sialadenitis.

80. Algorithm for radiodiagnosis in inflammatory diseases of the teeth and maxillofacial region. X-ray signs of caries according to the degree of the depth of the lesion?

81. Radiation diagnostic algorithm for inflammatory diseases of the teeth and maxillofacial region. X-ray signs of acute and chronic pulpitis

82. Radiation diagnostic algorithm for inflammatory diseases of the teeth and maxillofacial region. X-ray signs of types of chronic periodontitis.

83. Algorithm for radiodiagnosis in inflammatory diseases of the teeth and maxillofacial region. X-ray signs of periodontal disease.

84. Algorithm for radiodiagnosis in inflammatory diseases of the teeth and maxillofacial region. Differential diagnosis of periodontitis and periodontal disease.

85. Radiation diagnostic algorithm for inflammatory diseases of the teeth and maxillofacial region. X-ray picture of traumatic osteomyelitis.

86. Radiation diagnostic algorithm for inflammatory diseases of the teeth and maxillofacial region. X-ray picture of acute odontogenic osteomyelitis.

87. Radiation diagnostic algorithm for traumatic injuries of the maxillofacial region. Classification of traumatic injuries of teeth and jaws.

88. Algorithm for radiodiagnosis in traumatic injuries of the maxillofacial region. Name the radiation signs of fractures of the lower and upper jaws. Fragment fusion stages.

89. Radiation diagnostic algorithm for traumatic injuries of the maxillofacial region. Name and characterize the complications of fragment fusion in case of jaw fracture.

90. Algorithm for radiodiagnosis in case of dislocation of the temporomandibular joint. Radiation signs of dislocation in the temporomandibular joint.

91. Types of dental injuries. Classification. Direct x-ray symptoms of a fracture of the jaw and tooth. Types of displacement of fragments.

92. Types of dental injuries. Classification. Name more typical radiographic symptoms of tooth dislocation.

93. Radiation diagnostic algorithm for cysts of the maxillofacial region. Name the radiation signs of follicular and radicular cysts.

94. Algorithm of radiation diagnostics for cysts of the maxillofacial region. List the radiation signs of odontogenic and non-odontogenic fissural cysts and nasolabial cysts.

95. Radiation diagnostic algorithm for benign tumors of the maxillofacial region. Name the radiation signs of odontogenic and non-odontogenic tumors.

96. Algorithm for radiodiagnosis in malignant tumors of the maxillofacial region. List the radiation signs of epithelial and connective tissue tumors.

6.3. Suggested themes of term papers (projects)

Не предусмотрено

6.4. Suggested themes of term projects

Не предусмотрено

6.5. Suggested topics of calculation and graphic works

Не предусмотрено

7. Educational, methodological, informational and software support of the discipline (module)

The electronic catalog and electronic information resources provided by the scientific library of the FSBEI of HE "I. N. Ulianov Chuvash State University" are available at the link http://library.chuvsu.ru/

7.1. Regulatory documents, standards and rules

7.2. Recommended basic educational and methodological literature

№ item	Name
1	

7.3. Recommended supplementary educational and methodological literature

№ item	Name
1	

7.4. List of resources of the "Internet" information and telecommunication network

№ item	Name	Link to the resource
1		

7.5. Software, professional databases, information and reference systems, electronic educational resources and electronic library systems

Software, professional databases, information and reference systems provided by the Informatization Department of the FSBEI of HE "I.N. Ulianov Chuvash State University" are available for download at the link http://ui.chuvsu.ru //. The Unified Register of Russian programs for electronic computers and databases, including freely distributed ones, is available at the link reestr.minsvyaz.ru/reestr /.

7.5.1. Licensed and freely distributed software

Microsoft Windows operating System and/or Unix-like operating system and/or mobile operating system;

Office software packages:

Microsoft Office and/or LibreOffice

and (or) OpenOffice and (or) analogues;

Browsers, including Yandex.Browser.

List of software:

7.5.2. Lists of professional databases and (or) information reference systems and (or) electronic library systems and (or) electronic educational resources

8. Material and technical support of the discipline

Classrooms for lecture-type classes in the discipline are equipped with a teacher's automated workplace consisting of: a personal computer/laptop, multimedia equipment with a screen and (or) SMART interactive whiteboard/SMART TV.

The premises for students' independent work are equipped with computer equipment enabling to connect to the Internet and provide access to the electronic information and educational environment of the FSBEI of HE "I.N. Ulianov Chuvash State University".

№ item	Lesson type	Brief description and characteristics of the composition of installations, measuring and diagnostic equipment, computer equipment and experimental automation tools
1		Учебная аудитория для занятий семинарского типа, текущего контроля и промежуточной аттестации. Оборудование: учебная доска, учебная мебель, вытяжной шкаф, фотометр фотоэлектрический КФК-3-01, переносное мультимедийное оборудование (проектор, экран, ПК или ноутбук)

9. Means of adapting the discipline teaching to the needs of persons with physical conditions

If necessary, persons with physical conditions can be offered one of the following options for perceiving information, taking into account their individual psychophysical characteristics:

1) using e-learning and distance learning technologies.

2) using special equipment (enginery) and software in accordance with the students' health restrictions in the Training Centers for Persons with Disabilities and Physical Conditions (hereinafter referred to as special needs) available at the university.

In the course of training, if necessary, the following conditions are provided for persons with visual, hearing and musculoskeletal disorders:

- for persons with visual impairments: educational and methodological materials in printed form in enlarged font; in the form of an electronic document; in the form of an audio file (conversion of educational materials into audio format); in printed form in Braille; individual consultations involving a tactile interpreter; individual assignments and consultations.
- for people with hearing impairments: educational and methodological materials in printed form; in the form of an electronic document; video materials with subtitles; individual consultations involving a sign language interpreter; individual assignments and consultations.
- for persons with disorders of the musculoskeletal system: educational and methodological materials in printed form; in the form of an electronic document; in the form of an audio file; individual assignments and consultations.

10. Guidelines for students to perform independent work

The purpose of the student's independent work (IW) is to consolidate the theoretical knowledge gained and to acquire practical skills in using and performing research of algorithms and data structures when designing application software programs. IW includes independent study of educational issues, preparation for laboratory classes, performing calculation and graphic work, preparation for a test and an exam.

The list of questions and tasks for independent work to prepare for laboratory classes is given in the corresponding methodological instructive regulations in the description of each laboratory work.

The list of questions and tasks for independent work to carry out calculation and graphic work is given in the relevant methodological instructive regulations.

Topics for self-study essays:

1. History of the development of the discipline of radiation diagnostics and radiation therapy.
2. Tactics of complex radiological examination of patients with the most common and dangerous diseases and clinical syndromes.
3. Tomography method
4. Basic laws of skiology.
5. Modern X-ray image converters.
6. Electroroentgenography.
7. Angiography - a method of contrast study of blood vessels.
8. The role of RRI (X-ray image intensifier) in radiology.
9. Principles of X-ray radiation of moving organs.
10. Contrast agents in radiology.
11. X-ray methods of examination of teeth and maxillofacial area.
12. X-ray diagnosis of diseases of the teeth and maxillofacial area.
13. X-ray diagnostics of caries, pulpitis, periodontitis, periodontal diseases.
14. Radiation diagnosis of inflammatory diseases, cysts, benign and malignant tumors of the jaws, anomalies in the development of teeth and jaws.
15. Radiation diagnosis of traumatic injuries of the maxillofacial region.
16. Radiation diagnosis of diseases of the temporomandibular joint.
17. Radiation diagnosis of diseases of the salivary glands, submandibular region.

11. Methodological instructive regulations for students studying the discipline (module)

A laboratory lesson is one of the forms of educational work, which is focused on consolidating the studied theoretical material, its deeper assimilation and the formation of the ability to apply theoretical knowledge for practical purposes. Particular attention in practical classes is paid to the development of educational or professional skills. Such skills are formed in the process of performing specific tasks - situational tasks, reading radiographs, exercises, tasks, etc. - under the guidance and supervision of a teacher. The leading goal of practical classes is the formation of skills and the acquisition of practical experience aimed at the formation of professional competencies (the ability to perform certain actions, operations necessary in professional activities) or general competencies (general competencies are necessary for successful activity both in professional and non-professional areas) .

The content of laboratory classes is the solution of various kinds of problems, including professional ones (analysis of clinical situations, solving situational problems, performing professional functions in business games, etc.), reading the results of radiation methods of research, working with regulatory documents, reference books, and more .

To prepare for a laboratory lesson, the student needs to study the theoretical material on this topic, remember the basic definitions and rules, and analyze the data in the lectures on solving problems. To consolidate the material covered, the student needs to do homework in accordance with the assignment received in the previous practical lesson. In case of difficulties in its implementation, it is recommended to seek help from the teacher at the time allotted for consultations.

Stages of preparation for a laboratory lesson:

- study of the theoretical material received at the lecture and in the process of independent work;
- doing homework;

- self-examination on control questions of the topic.

Preparation for the seminar.

A seminar is a special form of educational and theoretical classes that serves as an addition to a lecture course. The seminar is usually devoted to a detailed study of a particular topic.

Stages of preparation for the seminar:

• analyze the topic of the seminar, think about the purpose and the main issues brought up for discussion;

• carefully read the material given by the teacher on this topic at the lecture;

• study the recommended literature, while taking notes of what you read or extracts that will be needed during the discussion at the seminar;

• try to formulate your opinion on each issue and substantiate it with arguments;

• write down the questions that have arisen during independent work with textbooks and scientific literature, so that later at the seminar you will receive answers to them.

Laboratory studies can be of a reproductive, partially - search and search character.

Works that are of a reproductive nature are distinguished by the fact that during their implementation, students use detailed instructions that indicate: the purpose of the work, explanations (theory, main characteristics), equipment, apparatus, materials and their characteristics, the procedure for performing work, radiographs, control questions , educational and special literature.

Works that are partially exploratory in nature are distinguished by the fact that during their implementation, students do not use detailed instructions, they are not given the procedure for performing the necessary actions, and require students to independently select equipment, choose ways to perform work in instructive and reference literature and etc.

Research works are characterized by the fact that students must solve a new problem for them, based on their theoretical knowledge.

Forms of organization of students in laboratory classes: frontal, group and individual.

With the frontal form of organizing classes, all students perform the same work at the same time.

In the group form of organizing classes, the same work is performed by teams of 2-5 people.

With an individual form of organizing classes, each student performs an individual task.

Preparation of a written report on the work performed in accordance with the requirements. A written report on the completed laboratory session should contain the following information:

- title of the work and information about the author of the report (course, name, surname);
- the purpose of the work and the formulation of the method of analysis used;
- a description of the performance of laboratory studies or calculations;
- Bibliography.

Grades for the performance of laboratory work are taken into account as an indicator of the current progress of the student.

11.1. Methodological instructive regulations for preparing for seminar-type classes

11.2. Methodological instructive regulations for preparing for an examination

The exam aims to evaluate the work of a student for a certain course: the theoretical knowledge gained, its strength, the development of logical and creative thinking, the acquisition of independent work skills, the ability to analyze and synthesize the knowledge gained and put into practice the solution of practical problems.

The exam is held in writing on tickets approved by the head of the department. The examination ticket includes two questions and tasks. The wording of the questions coincides with the wording of the list of questions brought to the attention of students one month before the examination session. In the process of preparing for the exam, a pre-exam consultation was organized for all study groups. The result of the examination is expressed as "excellent", "good", "satisfactory".

In order to clarify the assessment, the examiner can ask no more than one or two additional questions that do not go beyond the requirements of the work program. An additional question is a question that is not related to the subject matter of the ticket questions. An additional question, as well as the main questions of the ticket, requires a detailed answer. In addition, the teacher can ask a number of clarifying and leading questions related to the subject of the main questions of the ticket. The number of clarifying and leading questions is not limited.

11.3. Methodological instructive regulations for preparing for a test

не предусмотрено

11.4. Methodological instructive regulations for performing computational and graphical

Не предусмотрено

11.5. Methodological instructive regulations for performing a control work

11.6. Methodological instructive regulations for performing a course work (project)

Не предусмотрено

List of additions and changes

The name and details (if any) of the document attached to the Working Program of the discipline (module) containing the text of updates	Department's decision		Full name of department head:
	Date	Protocol №	