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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 normal and topographic Anatomy with operative Surgery

«APPROVE»

Vice-rector for Academic Affairs

  
I.E. Poverinov

« 13 » 04 2022

**Working programs of the discipline (module)**  
**«АНАТОМИЯ / Anatomy»**

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 – 1, 2

Term – 1, 2, 3

Total academic hours/credit points – 360/10

The year of beginning the training - 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:

Docent, Candidate of Medical Sciences E.G.Drandrova

The working program was approved at the meeting of the Department of normal and  
topographic Anatomy with operative Surgery,

27.05.2021, protocol № 10

Head of the department G.yu.Struchko

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 - the acquisition by the student of in-depth, detailed knowledge of the structure and function of the organs of the head and neck and general information on the anatomy of the organs and tissues of the human body as a whole, its constituent organ systems; ensuring the assimilation of the level of knowledge about the structure of the body, necessary for the study of other theoretical and clinical disciplines, as well as in the future practice of a dentist.

The objectives of the discipline - 1) the acquisition by students of theoretical knowledge of the anatomy of the musculoskeletal system, splanchnology, angiology, neurology, aesthesiology, the endocrine apparatus and organs of the immune system;

2) mastering the practical skills of working with anatomical preparations (bone, wet, dummies, etc.), with cadaveric materials;

3) the acquisition by students of theoretical knowledge of the topography, structure and function of the organs of the head and neck, taking into account individual, gender and age characteristics, developmental anomalies;

4) instilling in students the ability to clearly navigate the structure of the human body, accurately and accurately find the location and projection of organs and their parts;

5) teaching students an integrated approach, understanding the structure of the human body as a whole; show the importance of anatomy for applied and practical medicine.

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

The discipline «Анатомия / Anatomy» относится к обязательной части учебного плана 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):

### 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)
ОПК-9 Способен оценивать морфофункциональные, физиологические состояния и патологические процессы в организме человека для решения профессиональных задач / He/she is able to evaluate morphofunctional, physiological states and pathological processes in the human body to solve	ОПК-9.1 Способен распознавать морфофункциональные, физиологические состояния и патологические процессы в организме человека / He/she is able to recognize morphofunctional, physiological states and pathological processes in the human body	To know: anatomy and topography of organs, details of their structure and main functions, age-sex and individual characteristics; detailed structure, topography and functions of the organs of the head and neck, their blood supply and innervation; variants and anomalies in the development of the organs of the head and neck; projection of organs, large vessels on the surface of the body To be able to: find and show

<p>professional problems</p>		<p>organs, their parts, structure, large vessels and nerves on a corpse or individual preparations; find and demonstrate on the preparations the detailed structure of the organs of the head and neck, vessels, nerves, feel the main groups of the lymph nodes of the head and neck, correctly name them in Russian and Latin; determine the points of pulsation and possible clamping of the arteries</p> <p>To have skills of: determining the constitutional type of a person by external signs (brachy, meso- or dolichomorphic, identifying disproportions of body parts, deformations, visually detectable developmental anomalies; palpating bone landmarks of the body</p>
<p>ОПК-9 Способен оценивать морфофункциональные, физиологические состояния и патологические процессы в организме человека для решения профессиональных задач / He/she is able to evaluate morphofunctional, physiological states and pathological processes in the human body to solve professional problems</p>	<p>ОПК-9.2 Способен анализировать морфофункциональные, физиологические состояния и патологические процессы в организме человека / He/she is able to analyze morphofunctional, physiological states and pathological processes in the human body</p>	<p>To know: anatomical terms in accordance with the International Anatomical Nomenclature; regularities in the structure of the human body as a whole, anatomical and functional relationships of individual parts of the body with each other</p> <p>To be able to: using the acquired knowledge about the structure, topography of organs, their systems and apparatuses, the body as a whole, clearly navigate the complex structure of the human body; determine the location and projection of organs and their parts on the surface of the body; analyze educational and scientific literature, Internet resources containing information on human anatomy</p> <p>To have knowledge of: medical and anatomical conceptual apparatus</p>
<p>ОПК-9 Способен оценивать морфофункциональные, физиологические состояния и патологические процессы</p>	<p>ОПК-9.3 Способен диагностировать морфофункциональные, физиологические состояния и патологические</p>	<p>To know: age-sex and individual structural features of organs, systems and the body as a whole</p> <p>To be able to: show the organs of the head and neck, their parts and</p>

в организме человека для решения профессиональных задач / He/she is able to evaluate morphofunctional, physiological states and pathological processes in the human body to solve professional problems	процессы организма человека / He/she is able to diagnose morphofunctional, physiological states and pathological processes in the human body	details of the structure on images obtained by various imaging methods (X-rays, computed tomography and magnetic resonance imaging, etc.); process and link together the obtained morphological data To have skills of anatomical and craniometric research methods
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#### 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
Introduction	Introduction into Anatomy. History of Anatomy development	ОПК-9	ОПК-9.1, ОПК-9.2, ОПК-9.3
	Development of human organism		
Locomotor apparatus	Osteology. Bones of trunk, limbs		
	Arthrosyndesmology. Joints of bones of the trunk, limbs		
	Myology: muscles and fasciae of the trunk, limbs. Elements of topographic anatomy		
Neurology: Central nervous system, spinal nerves	Central nervous system: spinal cord and brain. Conducting tracts. Meninges of the brain		

Neurology: Central nervous system, spinal nerves	Peripheral nervous system. Spinal nerves. Topography of the nerves in various parts of the body	ОПК-9	ОПК-9.1, ОПК-9.2, ОПК-9.3
Splanchnology	Digestive system. Peritoneum		
	Respiratory system. Pleura. Mediastinum		
	Urinary and reproductive systems. Perineum		
Cardiovascular system	Heart. Systemic and pulmonary circulations. Arteries and veins of the thoracic and abdominal cavity, pelvis, extremities. Topography of vessels in various parts of the body. Lymphatic system		
Anatomy of skull, muscles and fasciae of head and neck	Craniology. Bones of cerebral and facial skull, skull as a whole		
	Junctions of skull bones. Muscles and fasciae of the head and neck		
Organs of head and neck. Dental system	Oral cavity. Salivary glands. Nasal cavity. Pharynx. Teeth: general and particular anatomy. Dental system as a whole		
Aesthesiology	Sense organs: eye, ear, organs of smell and taste		
Vessels of head and neck	Arteries and veins of head and neck, blood supply to the organs of the head and neck, lymph drainage		
Neurology: cranial nerves and autonomic nervous system	Cranial nerves: topography, areas of nerve supply		
	Autonomic nervous system: sympathetic and parasympathetic divisions. Nerve supply of the organs of head and neck		
	Exam		

#### 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)
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	1	2	3	total	
1. Face-to-face work:	64	64,2	64,3	192,5	
In-class learning in total, including:	64	64	64	192	
Лекционные занятия (Лек)	16	16	16	48	
Лабораторные занятия (Лаб)	48	48	48	160	
Индивидуальная контактная работа (ИКР)		0,2	0,3	0,5	
2. Independent work of the student:	44	43,8	43,7	131,5	
3. Intermediate certification (exam) (зачет, экзамен)		За, Эк			
Total:	academic hours	108	108	144	360
	credit units	3	3	4	10

№ 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		
	Introduction						
1	Introduction into Anatomy. History of Anatomy development	2				4	6
2	Development of human organism	2				6	8
	Locomotor apparatus						
3	Osteology. Bones of trunk, limbs	2		9			11
4	Arthrosyndesmology. Joints of bones of the trunk, limbs	2		9		6	17
5	Myology: muscles and fasciae of the trunk, limbs. Elements of topographic anatomy	2		12		7	21
	Neurology: Central nervous system, spinal nerves						
6	Central nervous system: spinal cord and brain. Conducting tracts. Meninges of the brain	6		18		21	45
7	Peripheral nervous system. Spinal nerves. Topography of the nerves in various parts of the body	2		9		6	17

	Splanchnology						
8	Digestive system. Peritoneum	4		6		9	19
9	Respiratory system. Pleura. Mediastinum	2		6		9	17
10	Urinary and reproductive systems. Perineum	2		9		9	20
	Cardiovascular system						
11	Heart. Systemic and pulmonary circulations. Arteries and veins of the thoracic and abdominal cavity, pelvis, extremities. Topography of vessels in various parts of the body. Lymphatic system	6		18	0,2	10,8	35
	Anatomy of skull, muscles and fasciae of head and neck						
12	Craniology. Bones of cerebral and facial skull, skull as a whole	2		12			14
13	Junctions of skull bones. Muscles and fasciae of the head and neck	2		8			10
	Organs of head and neck. Dental system						
14	Oral cavity. Salivary glands. Nasal cavity. Pharynx. Teeth: general and particular anatomy. Dental system as a whole	4		8		10	22
	Aesthesiology						
15	Sense organs: eye, ear, organs of smell and taste	2		8		8	18
	Vessels of head and neck						
16	Arteries and veins of head and neck, blood supply to the organs of the head and neck, lymph drainage	2		12			14
	Neurology: cranial nerves and autonomic nervous system						
17	Cranial nerves: topography, areas of nerve supply	2		8			10
18	Autonomic nervous system: sympathetic and parasympathetic divisions. Nerve supply of the organs of head and neck	2		8		9,7	19,7
19	Exam				0,3		0,3

Total academic hours	48		160	0,5	115, 5	360
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### 4.3. Summary of the discipline (module), structured by sections (topics)

#### Раздел 1. Introduction

##### Тема 1. Introduction into Anatomy. History of Anatomy development

Лекционное занятие. 1. About Normal and Topographic Anatomy with Operative surgery department of the medical faculty of the Chuvash State University.

2. Object, tasks, methods of Anatomy. Anatomic terminology. Anatomy among the other biological subjects. The significance of anatomy in studying of clinical disciplines. Methods of studying in anatomy. Separate fields of Anatomy. 6. Axes and planes in anatomy. International Anatomic Nomenclature, its use in medical education.

3. The main stages of Anatomy knowledge accumulation. 2. Pre-scientific period of anatomy development. Anatomical heritage of ancient China, India, Egypt, Greece, Rome. Works of Hippocrates, Aristotle, Galen, Avicenna, etc. Anatomy at the Renaissance. Leonardo da Vinci, A. Vesalius, Harvey B. - discovery of circulation.

The history of the anatomy in Russia. Scientific Anatomy in Russia (Prof. N.I. Pirogov, V.N. Tonkov, D.A. Jhdanov, V.N. Shevkunenko, etc. Establishment of universities and medical faculties in Russia.

##### Тема 2. Development of human organism

Лекционное занятие. 1. Initial stages of human embryogenesis. The doctrine of embryonic layers, patterns of their transformation. Derivation and formation of organs. Age periodization.

2. General plan of human organism structure. Levels of structural organization of the body: tissues, organs, systems of organs and apparatus. The concept of soma and internal organs. Regions of human body. Body types. Concept of norm, variants and anomalies of development.

#### Раздел 2. Locomotor apparatus

##### Тема 3. Osteology. Bones of trunk, limbs

Лекционное занятие. 1. General overview of the skeleton, its parts. Development of bones, types of osteogenesis.

2. Classification of bones according to their shape, structure, development and function. Parts of long bone. Growth of bone in length and width.

3. Bone as an organ. Periosteum, endosteum, their structure and functions. Compact and spongy bone, red and yellow bone marrow. Osteon as a morpho-functional unit of the bone. Physical and mechanical properties of bones.

4. Bone at an X-ray picture. Interconnection of bony and muscular systems, effect of labour and sport onto the structure of bony tissue. Changes of shape and structure of bones due to an aging.

Лабораторное занятие. Anatomical terms. Principles of latin terminology. Axes and planes in Anatomy. Vertebrae, structure of a typical vertebra. Peculiarities of structure of cervical, thoracic, lumbar vertebrae. Sacrum and coccyx. Ribs, structure, classification. True, false and floating ribs. Structure of sternum.

Bones of shoulder girdle: clavicle, scapula, their structure. Hip bone, its parts, their structure

Лабораторное занятие. Bones of free upper limb: humerus, bones of the forearm and hand, their structure.

Bones of free lower limb: femur, bones of the leg and foot, their structure.

Лабораторное занятие. Final lesson in bones of trunk and limbs

#### **Тема 4. Arthrosyndesmology. Joints of bones of the trunk, limbs**

Лекционное занятие. 1. Types of bone junctions, functions of joints. Types of non-synovial joints, their characteristics. Symphyses (hemiarthroses).

2. Synovial joints - diarthroses. Structure of a synovial joint. Main features of the synovial joints, their functional significance. Accessory structures of the synovial joint. Classification of synovial joints according to their structure, shape of articular surfaces and function, number of axes of movements. Movements in synovial joints, axes of movements.

3. Private arthrology. Vertebral column as a whole. Types of bone junctions in vertebral column Formation of physiological curves. Thoracic cage as a whole. Shapes of thoracic cage.

Joints of upper limb. Shoulder and hip joints, similarities and differences. Pelvis as a whole, its functional significance. Sexual differences of pelvis. Joints of free lower limb. Arches of the foot, their formation and functional significance.

Лабораторное занятие. Types of synovial and non-synovial joints. Structure of a synovial joint. Classification of synovial joints according to their structure, shape of articular surfaces. Movements in synovial joints.

Joints of vertebrae. "Joint of the head". Vertebral column as a whole, its physiological curves, their formation.

Junctions of the ribs. Costovertebral and sternocostal joints, movements in them. Thoracic cage as a whole.

Sternoclavicular and acromioclavicular joints.

Лабораторное занятие. Shoulder joint, its anatomical and functional peculiarities. Elbow joint. Junctions between bones of the forearm. Radiocarpal and midcarpal joints. "Joint of the hand". Joints of the hand. Solid basis of the hand.

Junctions of hip bones with each other (pubic symphysis) and with sacrum (sacroiliac joint). Pelvis as a whole (true and false pelvis). Gender peculiarities of pelvis. Dimensions of female pelvis, their application in obstetrics.

Hip joint. Knee joint. Junctions between bones of the leg. Talocrural joint. "Joint of the foot". Joints of the foot. Chopart's, Lisfrank's joints. Arches of the foot, their significance.

Лабораторное занятие. Final lesson in joints of trunk and limbs

#### **Тема 5. Myology: muscles and fasciae of the trunk, limbs. Elements of topographic anatomy**

Лекционное занятие. 1. Striated and smooth muscle tissue, features of their origin, structure and function.

2. Muscle as an organ. Skeletal muscle structure, parts. Classification of muscles according to shape, structure and function. Muscles-synergists and antagonists.

3. Auxiliary apparatus of muscles: fascia, synovial bags, synovial sheaths, osteo-fibrous canals, their functional significance. Anatomical substantiation of the possibility of the spread of inflammatory processes in the interfascial spaces and along the synovial sheaths.

4. Abdominal muscles. Weak spots in the anterior abdominal wall. Abdominal Press.

5. Main and accessory respiratory muscles. Diaphragm

Лабораторное занятие. Superficial and deep back muscles, structure and functions. Muscles of the chest. Participation of the chest muscles in the act of breathing. Diaphragm, its parts, structure, topography and functions.

Muscles and fascia of the abdomen. Rectus sheath, structural features of the anterior and posterior walls.

Weak points of the anterior abdominal wall: linea alba of the abdomen, umbilical ring, inguinal canal. The walls of the inguinal canal, its deep and superficial rings, the contents of the canal. Anatomical prerequisites for the development of various inguinal hernias. Abdominal press, its constituent elements, meaning.

Лабораторное занятие. Muscles of the shoulder girdle, upperarm, forearm and hand, their function. Topography of the upper limb. Axillary cavity, its topography, walls, contents. Clavipectoral, pectoral, subpectoral triangles, triangular and quadrangular spaces. Humeromuscular canal, its contents. Sulci of the upperarm and forearm.

Лабораторное занятие. Muscles and fascia of the pelvis, thigh, leg, foot. Topography: greater and lesser sciatic foramina, muscular and vascular spaces, obturator canal, their contents. Femoral ring. Saphenous hiatus (oval fossa). The femoral canal, its topography in the formation of a femoral hernia.

Topography of the lower limb: femoral triangle, femoral, adductor, cruropliteal canals. Popliteal fossa.

Лабораторное занятие. Final lesson in Myology

### **Раздел 3. Neurology: Central nervous system, spinal nerves**

#### **Тема 6. Central nervous system: spinal cord and brain. Conducting tracts. Meninges of the brain**

Лекционное занятие. 1. Development of the nervous system in embryogenesis. The role of the nervous system in the regulation and coordination of the functions of organs and systems, in the integration of parts of the body into a single unit and in the establishment of links between the body and the external environment.

2. Elements of the structure and functional characteristics of the nervous system. Departments of the nervous system: central and peripheral, somatic and autonomic. Neuron as a morphofunctional unit of the nervous system. Classification of neurons. Reflex arch as the anatomical basis of the reflex.

3. White and gray matter of the brain and spinal cord.

4. Spinal cord, topography, external and internal structure. Segment of the spinal cord. Patterns of skeletotopy of spinal cord segments at different levels of the vertebral column. Roots of the spinal cord, the formation of spinal nerves.

Лекционное занятие. 1. Brain vesicles and their transformations. Major parts of the brain. The brain stem, nuclei of the cranial nerves that lie in it. Reticular formation, its structure, functions. The diencephalon, its parts, structure, functions.

2. Telencephalon: cerebral hemispheres, its lobes, sulci, gyri. Olfactory brain. limbic system. The cortex of the hemispheres and cerebellum, the concept of cyto- and myeloarchitectonics of the cortex. Cortical nuclei of analyzers. Basal nuclei of the hemispheres, their structure and significance.

Лекционное занятие. 1. White matter of the hemispheres: associative, commissural and projection fibers. internal capsule.

2. Anatomical and functional classification of the projectional conducting tracts of the spinal cord and brain. General characteristics of the main ascending (exteroceptive) and

descending (pyramidal and extrapyramidal) projection conducting tracts.

3. Meninges and intermeningeal spaces of the brain and spinal cord. Features of the meninges of the brain. Formation, pathways of circulation and outflow of cerebrospinal fluid.

Лабораторное занятие. General plan of the structure of nervous system. Classification of neurons.

Spinal cord, position, external and internal structure. White and gray matter of the spinal cord. Reflex arch.

Segment of spinal cord, anterior and posterior roots. Spinal nodes. Formation of spinal nerves, their branches.

Meninges of the spinal cord, intermeningeal spaces and their contents.

General anatomy of the brain, its divisions. Base of the brain. Exit of cranial nerve roots.

Лабораторное занятие. Medulla oblongata, topography, external and internal structure, centers. Nuclei of XII-IX pairs of cranial nerves.

Pons, position, structure. Nuclei of VIII-V pairs of cranial nerves.

The cerebellum, its position, surfaces, parts, structure. Cerebellar nuclei. Cerebellar peduncles. Isthmus of the rhomboid brain, its composite parts.

IV ventricle, its walls, communications. Rhomboid fossa. Projection of the nuclei of the cranial nerves onto the rhomboid fossa.

The midbrain, its position, parts, their structure. Nuclei and conducting tracts of the midbrain. Cerebral aqueduct. Nuclei of III-IV pairs of cranial nerves.

Лабораторное занятие. The diencephalon, its parts: thalamencephalon, hypothalamus and their structure. Pituitary gland, pineal body, their position, structure. III ventricle, its walls, communications.

Endbrain. Cerebral hemispheres, sulci, lobes, gyri. The concept of analyzers. Cortical nuclei of analyzers. Peripheral and central parts of the olfactory brain.

Лабораторное занятие. Basal nuclei of the hemispheres: caudate, lentiform, amygdaloid body, claustrum, their structure, function.

White matter of the hemispheres: associative, commissural and projection fibers. internal capsule. Corpus callosum, fornix, anterior commissure.

Lateral ventricles, their parts, walls, communications.

Лабораторное занятие. Afferent (ascending) conducting tracts - exteroceptive, proprioceptive, interoceptive pathways, their general patterns.

Efferent (descending) conducting tracts. Pyramidal tract. Extrapyramidal system, formations related to it, functions.

Meninges of the brain, their features. Processes and sinuses of the dura mater. Cisterns of the subarachnoid space. Formation and outflow of cerebrospinal fluid.

Лабораторное занятие. Final lesson in Central nervous system

## **Тема 7. Peripheral nervous system. Spinal nerves. Topography of the nerves in various parts of the body**

Лекционное занятие. 1. Peripheral nervous system, its somatic and autonomic divisions. Ganglia (spinal and autonomic). The structure of the peripheral nerve. Patterns of distribution of nerves.

2. Formation of spinal nerves, their branches. Anterior branches, their participation in

the formation of plexuses. Cervical, brachial, lumbar, sacral plexuses, their formation, topography, branches, areas of innervation. Thoracic spinal nerves, their anterior branches (intercostal nerves). Posterior branches of the spinal nerves, their topography, areas of innervation.

Лабораторное занятие. Formation of spinal nerves, their branches: anterior, posterior, meningeal, communicating, their topography.

The anterior branches of spinal nerves, their participation in the formation of plexuses (cervical, brachial, lumbar, sacral, coccygeal).

Cervical plexus, features of its formation, topography, branches. Branches of the cervical plexus (muscular, cutaneous). Phrenic nerve (mixed), its topography in the neck, thoracic cavity, branches.

Brachial plexus, its formation, structure, topography. Trunks and cords of the brachial plexus, their relationship with the subclavian and axillary arteries. Short and long branches of the brachial plexus. Scheme of cutaneous innervation of the upper limb.

Thoracic spinal nerves, their topography. Anterior branches - intercostal nerves, their position. course. branches. areas of innervation.

Лабораторное занятие. Lumbar plexus, its formation, topography, branches, areas of innervation.

The sacral plexus, formation, topography. Short and long branches. Sciatic nerve, its topography, course and branches: tibial and common peroneal nerves. Innervation of individual muscle groups of the pelvic girdle and the free lower limb. Cutaneous innervation of the lower extremity.

Coccygeal plexus, branches, areas of innervation.

Posterior branches of the spinal nerves, areas of innervation.

Лабораторное занятие. Final lesson in spinal nerves

## **Раздел 4. Splanchnology**

### **Тема 8. Digestive system. Peritoneum**

Лекционное занятие. 1. The concept of skeletotopy, holo- and syntopy. Regions of the abdomen.

2. Classification of internal organs according to their topography, origin, structure and function. General principles of the structure of the walls of hollow organs.

3. Features of the structure of various parts of the digestive tube in connection with their function.

Лекционное занятие. 1. The concept of parenchymal organs, glands, their classification according to development, structure and function.

2. Functional anatomy of the liver, bile excretory ducts, pancreas.

3. Peritoneum, its parietal and visceral layers. Derivatives of the peritoneum: mesentery, greater and lesser omentums, ligaments, folds. The course of the peritoneum on the anterior wall of the abdominal cavity, folds and pits. Extra-, retro-, meso- and intraperitoneal position of organs.

3. Differences between the terms of "abdominal cavity" and "peritoneal cavity". The division of the peritoneal cavity into storeys, their topography. Ligaments, folds, recesses of the peritoneum in the true pelvis; the relation of the peritoneum to the pelvic organs in males and females.

Лабораторное занятие. The esophagus, its topography (skeletotopy, syntopy), parts, structure of the wall. Physiological and anatomical constrictions.

Stomach, its topography, relationship with the organs of the upper floor of the

abdominal cavity. Projection of the borders of the stomach onto the anterior abdominal wall. The structure of the stomach wall, functions.

Small intestine, its parts, topography, relation to the peritoneum. Duodenum, topography, relationship with the head of the pancreas. Mesenteric part of the small intestine (jejunum and ileum). Wall structure. Features of the structure of the mucous membrane and submucosa in various parts of the small intestine. Intestinal villi, lymphoid nodules.

Large intestine, its topography, divisions, main external features. Features of the structure of the walls of the colon, function. Caecum, appendix. Rectum, its parts, topography, structure, sphincters.

Лабораторное занятие. The liver, its topography, projection of the boundaries onto the skin. The structure and functions of the liver. relation to the peritoneum. Ligaments of the liver. Gallbladder, bile excretory ducts, their topography and structure.

Pancreas, its topography, parts, structure, excretory ducts, insular apparatus.

Peritoneum, its layers, cavity. Floors of the peritoneal cavity. Hepatic, omental and pregastric bursae in the upper floor of the peritoneal cavity, their communications. Greater and lesser omenta. Omental bursa, epiploic foramen. Course of the peritoneum in the middle and lower floors of the peritoneal cavity.

Derivatives of the peritoneum: mesentery, ligaments, folds, limiting fossae. The relation of the organs of the abdominal cavity and true pelvis to the peritoneum.

## **Тема 9. Respiratory system. Pleura. Mediastinum**

Лекционное занятие. 1. Parts of the respiratory system. Features of the structure of the walls of respiratory tract.

2. Larynx as a respiratory organ and vocal apparatus. Voice formation: adjusting and straining apparatus of the larynx; muscles that provide their functions. Trachea.

3. Lungs, topography, structure. Lobes, bronchopulmonary segments and lung lobules. bronchial tree. Patterns of branching of the bronchi in the lung. Acinus is a morphofunctional unit of the lung.

4. Pleura, its layers, cavity. Pleural sinuses, their clinical significance. Mediastinum. Organs of the anterior and posterior mediastinum.

Лабораторное занятие. Division of the respiratory tract into upper and lower.

Larynx as part of the respiratory system and as a voice-producing organ, topography, structure. Voice formation mechanism. Muscles of the larynx. The cavity of the larynx. Trachea, main bronchi, topography, structure.

Lungs: position, structure, function. borders of the lungs. Elements of the root and hilum of the lung. Surfaces, lobes, bronchopulmonary segments and lobules of the lung. Branching of the bronchi in the lung. The morphofunctional unit of the lung is the acinus.

Pleura, its layers, cavity. Sinuses of the pleura, their significance. Borders of the pleura.

Mediastinum: anterior and posterior, their composition. Thymus gland, position, structure, functions, age characteristics.

Лабораторное занятие. Final lesson in digestive and respiratory systems

## **Тема 10. Urinary and reproductive systems. Perineum**

Лекционное занятие. 1. Parts of the urinary system.

2. Topography of the kidney. Muscular seat of the kidney, coverings the kidney. Nephron is a morphofunctional unit of the kidney. Fixation apparatus of the kidney. The structure of the parenchyma of the kidney and pyelocaliceal system.

3. Ureter, urinary bladder, features of their structure, functions.

4. Male reproductive organs: internal and external. Testis, its topography and structure. The derivation and descent of the testicle, formation of its membranes, the functions of the testis. The spermatic cord, vas deferens and ejaculatory ducts, their topography, structure, functional significance. The prostate gland as a gland of mixed secretion. Male urethra, features of its structure.

5. Female reproductive organs. Uterus, topography, parts, relation to the peritoneum. The structure of the walls of the uterus, structural features of the endometrium. Uterine appendages. Ovary, topography, structure. Cyclic and age-related changes in the ovary.

Лабораторное занятие. Kidneys, their position, coverings, fixation apparatus, structure. relation to the peritoneum. Renal hilum, sinus. Small and large renal calyces, renal pelvis. Nephron is a morphofunctional unit of the kidney. Excretory tree of the kidney.

Ureters: position, parts, wall structure. Features of the course in the true pelvis in males and females.

Urinary bladder: position, structure of the walls. Relation to the peritoneum in its various functional states (empty or full).

Internal male reproductive organs. Testis, its topography and structure. Epididymis. Coverings of the testis. The spermatic cord, topography, parts, components. The vas deferens and ejaculatory duct.

Prostate gland: topography, parts, structure. Seminal vesicles, bulbourethral glands, position, structure.

External male reproductive organs. The penis, its structure. Scrotum.

Male urethra, topography, parts, constrictions, curves, their significance during catheterization.

Лабораторное занятие. Internal female reproductive organs. Ovary, topography, structure, relation to the peritoneum. The uterus, its topography, shape, parts, relation to the peritoneum. The structure of the walls of the uterus. Fixation apparatus of the uterus. Fallopian tube, position, parts, wall structure, relation to the peritoneum. The concept of "uterine appendages". Vagina, position, vaults, their significance, structure of the walls.

Female urethra, position, structure.

External female reproductive organs. Major and minor pudendal lips. Vaginal vestibule. Major and minor vestibular glands. Clitoris.

Perineum. Perineum in the narrow and broad sense of the word. Pelvic diaphragm and urogenital diaphragm, their topography (muscles and fascia). Ischioanal fossa, topography, content, significance in proctology.

Лабораторное занятие. Final lesson in Urinary and Reproductive Systems

## **Раздел 5. Cardiovascular system**

### **Тема 11. Heart. Systemic and pulmonary circulations. Arteries and veins of the thoracic and abdominal cavity, pelvis, extremities. Topography of vessels in various parts of the body.**

#### **Lymphatic system**

Лекционное занятие. 1. Development of the heart. Topography, external structure of the heart. Chambers of the heart.

2. The structure of the wall of the heart. Valvular apparatus of the heart. Conducting system of the heart, its nodes and bundles. Pericardium, its layers, cavity.

3. Features of the blood supply of the heart.
4. Systemic and pulmonary circulations. Features of the fetal circulation. Most common congenital heart diseases.

Лекционное занятие. 1. Cardiovascular system, its parts: heart as a central organ, the circulatory and lymphatic systems. Arteries and veins. Features of the structure of the walls of arteries and veins of different calibers. The main components and links of the microcirculatory stream. Patterns of the distribution of blood vessels.

2. Connections and anastomoses in the circulatory system, their clinical significance.
3. Veins, their features. Superficial and deep veins, their distribution. Anatomical and physiological factors that ensure the movement of blood through the veins.
4. Venous plexi. Systems of the superior and inferior vena cava. portal venous system. Venous anastomoses: porta-caval, cava-caval. Their significance in normal and pathological conditions.

Лекционное занятие. 1. Functions of the lymphatic system. Lymph capillaries, their structure and difference from blood capillaries. Lymphatic vessels, structural features. Factors that ensure the movement of lymph. Lymph nodes, their structure and functions.

2. The main groups of lymph nodes of the trunk, neck and limbs. Large lymphatic vessels, lymphatic ducts and trunks. Main lymphatic collectors: thoracic duct, right lymphatic duct. The outflow of lymph from organs often affected by cancerous tumors.
3. Lymphoepithelial organs, their position, functions.

Лабораторное занятие. Heart: position, structure. Atria and ventricles, structure of their walls. The valvular apparatus of the heart - semilunar and cuspid valves. Arteries and veins of the heart. Conducting system of the heart, its nodes and bundles. Pericardium.

- Systemic and pulmonary circulations. Fetal circulation, its features.
- Arteries of the pulmonary circulation. Pulmonary trunk, pulmonary arteries. Arteries of the systemic circulation. Aorta, its parts, topography. Branches of the ascending part, aortic arch. General data on the arteries of head and neck.

Лабораторное занятие. Thoracic part of the aorta, its topography. Parietal and visceral branches and anastomoses between them. General data on the subclavian artery.

Axillary artery, its topography, parts, branches. Brachial, radial, ulnar arteries, their topography, branches, anastomoses between branches. Superficial and deep arterial palmar arches of the hand, their formation, topography, branches. Arterial networks of the shoulder, elbow, wrist joints.

Superficial and deep veins of the upper limb.

Лабораторное занятие. Abdominal part of aorta, its topography. Parietal and visceral unpaired and paired branches. Blood supply to the organs of thoracic and abdominal cavities. Anastomoses between the branches of abdominal aorta, their role in the collateral circulation of organs.

Arteries of pelvis. Common iliac artery, external and internal iliac arteries, their topography, branches. Blood supply to the pelvic organs.

Superior vena cava, its formation, topography. Brachiocephalic veins, their formation, topography, features on the right and left sides. General information about the veins of head and neck. Tributaries of superior vena cava. Azygos and hemiazygos veins. Vertebral venous plexuses - external and internal, their significance in the formation of anastomoses between systems of superior and inferior vena cava.

Inferior vena cava, its formation, topography, tributaries. Portal vein, its topography, roots and tributaries. Drainage of venous blood from organs of abdominal cavity and true

pelvis. Porta-caval and cava-caval anastomoses.

Лабораторное занятие. Femoral artery, topography, branches. Popliteal artery, anterior and posterior tibial arteries, their topography, branches. Plantar and dorsal arteries of the foot, anastomoses between these arteries. Arterial networks of the hip, knee, talocrural joints.

Deep and superficial veins of the lower limb. Iliac veins.

Лабораторное занятие. Lymphatic system, its significance in normal and pathological conditions. Lymph nodes: structure and functions. The main groups of regional lymph nodes of the extremities, pelvis, thoracic and abdominal cavities.

Large lymphatic vessels, trunks, main lymph collectors. Thoracic duct, its formation, topography in the abdominal and thoracic cavities and lower neck. Right lymphatic duct.

Drainage of lymph from various organs and parts of the body.

Лабораторное занятие. Final lesson in cardiovascular system

## **Раздел 6. Anatomy of skull, muscles and fasciae of head and neck**

### **Тема 12. Craniology. Bones of cerebral and facial skull, skull as a whole**

Лекционное занятие. 1. Development of the skull bones in the prenatal period of ontogenesis.

2. Skull as a whole. Division into vault and base. Cranial fossae. Openings and their purposes.

3. Structure and topography of the facial and cerebral skull in different age periods. Features of the skull of a newborn. Fontanelles, dynamics and timing of their overgrowth. Age-related changes in the bones of the skull.

4. Sexual and individual features of the skull.

5. Craniometry. The main variants of the structure and anomalies in the development of the bones of the skull. X-ray anatomy of the skull.

Лабораторное занятие. The structure of individual bones of the neurocranium: frontal, occipital, parietal, sphenoid, ethmoid.

The structure of temporal bone, its parts. Canals of the temporal bone. Mandibular fossa, articular tubercle.

Лабораторное занятие. Maxilla, body surfaces, relief of each of the body surfaces, frontal, zygomatic, alveolar and palatine processes. Maxillary sinus, its shape, walls. Buttresses of the upper jaw.

Mandible, development, ossification, shape, parts. Detailed structure of the alveolar part and body of the mandible. Mandibular canal, its relationship with the roots of the teeth. Angle of the mandible. Ramus of the mandible, coronoid and condylar processes. Buttresses of the lower jaw.

Zygomatic, palatine, lacrimal, nasal bones. Inferior turbinate bone. Vomer. Hyoid bone.

Orbit, its walls, communications. The nasal cavity, its walls and communications. Paranasal sinuses. Bony base of the oral cavity.

The structure of the facial skull in different age periods.

Лабораторное занятие. Cranial vault and cranial base. Internal base of the skull: anterior, middle and posterior cranial fossae. Topography of the temporal, infratemporal and pterygopalatine fossae.

The skull of a newborn (fontanelles, the timing of their overgrowth, other features).

Changes in the ratio of the sizes of the brain and facial skull, as well as their parts in childhood, adolescence and youth. Terms of the final formation of the facial and cerebral skull (cranial vault and cranial base).

X-ray anatomy of the skull.

### **Тема 13. Junctions of skull bones. Muscles and fasciae of the head and neck**

Лекционное занятие. 1. Temporomandibular joint, features of its structure. Movements in the joint and mechanisms of these movements.

2. Muscles of facial expression, features of their structure, position and function. Muscles of the cranial vault.

3. Masticatory muscles, their development, differences in structure. Features of each muscle, function. Movements in the temporomandibular joint produced by masticatory muscles.

4. Fascia of the head: temporal, parotidomasseteric, buccopharyngeal. Osteo-fascial and intermuscular cellular spaces of the head.

5. Muscles of the neck. Muscles that depress the mandible. Topography (triangles) of the neck.

6. Anatomy and topography of the layers of the cervical fascia. Cellular spaces of the neck, their position, walls, communications, content, practical significance.

Лабораторное занятие. Joints of the bones of the skull. Non-synovial joints of the skull (sutures, synchondroses).

Temporomandibular joint: shape and position of the head of the condylar process, mandibular fossa, articular tubercle. Articular cavity, its division into floors. Borders of attachment of the joint capsule. Intraarticular and extraarticular ligaments. The shape of articular surfaces, movements in the joint and the mechanisms of these movements.

Muscles and fasciae of the head. Muscles of facial expression, features of their structure, functions. Muscles of facial expression, their origin, insertion, functions. Fasciae of the head, osteo-fascial and intermuscular spaces of the head.

Muscles of the neck. Superficial muscles. Muscles located above and below the hyoid bone. Muscles that perform movements in the temporomandibular joint.

Deep muscles of the neck. Suboccipital muscles. Topography (triangles) of the neck. Fascia of the neck. Cellular spaces of the neck, their position, walls, communications, content, practical significance.

Лабораторное занятие. Final lesson in bones of skull and their joints, muscles and fasciae of the head and neck

## **Раздел 7. Organs of head and neck. Dental system**

### **Тема 14. Oral cavity. Salivary glands. Nasal cavity. Pharynx. Teeth: general and particular anatomy. Dental system as a whole**

Лекционное занятие. 1. Development of the oral cavity. Congenital malformations - cleft lip, cleft palate.

2. The vestibule and the oral cavity proper. The structure and functions of the tongue. The structure and position of the major salivary glands, topography of their excretory ducts. Minor salivary glands.

3. Components of the chewing and speech apparatus.

4. General anatomy of teeth. Development of teeth. Enamel, dentin, cementum, their structure. The structure of the parodontium and periodontium. The concept of the dental organ. Parts of the tooth, tooth cavity. Pulp.

5. Signs of teeth.

Лекционное занятие. Private anatomy of teeth. Differences in the number, position and shape of teeth.

Milk teeth, their features. Timing of eruption of milk and permanent teeth.

Dental system as a whole. dental segments. Dental arch, alveolar arch. Dental formulas: complete, group of permanent and milk teeth. Alphanumeric formula of teeth. Articulation, occlusion. Physiological and pathological occlusions.

Лабораторное занятие. Oral cavity: vestibule and oral cavity proper, walls. Cheeks, their structure. Gums. The mucous membrane of the vestibule, its glands. Floor of the oral cavity, hard and soft palate, their structure. Muscles of the soft palate. Fauces, its boundaries.

Tongue, its parts, structure, function. Muscles of the tongue. Features of the mucous membrane.

Salivary glands: major and minor, their structure and function, excretory ducts, their topography.

The pharynx, its topography, parts, structure of the walls. Muscles of the pharynx, pharyngeobasilar fascia. The act of swallowing. Lymphoepithelial ring of Pirogov-Waldeyer.

External nose. The nasal cavity, its walls, areas, nasal passages. Paranasal sinuses, their communication with the nasal passages, significance.

Лабораторное занятие. General anatomy of teeth. Development of teeth. Enamel, dentin, cementum, their structure. The structure of the parodontium and periodontium. Parts of the tooth, tooth cavity. Pulp. surface of the crown of the tooth. Tooth signs: crown angle sign, crown curvature sign, root sign.

Milk teeth, their features. Timing of eruption of milk and permanent teeth.

Dental arch, alveolar arch. Occlusion. Dental formulas: complete, group of permanent and milk teeth. Alphanumeric formula of teeth. Articulation. Occlusion physiological and pathological.

Dental system as a whole. Dental segments. Anatomical characteristics of each of the segments of the upper and lower jaws. The ratio of the roots of the teeth with the nasal cavity, maxillary sinus and mandibular canal.

## **Раздел 8. Aesthesiology**

### **Тема 15. Sense organs: eye, ear, organs of smell and taste**

Лекционное занятие. 1. Anatomical and functional characteristics of the sense organs.

2. The organ of vision, its development, topography, structure and function.

Tunics and nucleus of the eyeball. Formation and outflow of aqueous humor of the eye. Refractive media of the eyeball. Auxiliary apparatus of the eye.

3. The conducting tract of the visual analyzer.

4. The organ of hearing and balance. External, middle and inner ear, structure, topography and functions. The mechanism of perception and conduction of sounds.

5. The conducting tract of the auditory analyzer.

Лабораторное занятие. Eyeball, position. Tunics of the eyeball, their structure. Nucleus. Anterior and posterior chambers of the eye, communications; aqueous humor, its formation and outflow. Lens. Vitreous body.

Auxiliary organs of the eye: eyelids, conjunctiva; eyeball muscles. Eyeball sheath, episcleral space. Lacrimal gland and lacrimal ducts. Blood supply to the organs of the eye.

The conducting tract of the visual analyzer.

External ear: auricle, external auditory meatus, its bends, parts; tympanic membrane, position, structure.

Middle ear: tympanic cavity, its walls, contents; auditory tube, its parts, structure. Ear

ossicles, their structure, connections between them.

Лабораторное занятие. Final lesson in organs of head and neck and organs of sense.

## **Раздел 9. Vessels of head and neck**

### **Тема 16. Arteries and veins of head and neck, blood supply to the organs of the head and neck, lymph drainage**

Лекционное занятие. 1. The common carotid artery, its topography, features of its origin and topography on the right and left sides. External carotid artery, topography, groups of branches, variants of origin levels, blood supply areas, anastomoses.

2. Blood supply to the upper and lower teeth.

3. Internal carotid artery, its branches, topography, areas of blood supply. Subclavian artery, topography, differences in the origin of the right and left subclavian arteries, branches and areas of blood supply.

5. Anastomoses between the systems of the external carotid, internal carotid, subclavian arteries. Cerebral arterial circle (Circle of Willis).

6. Veins of the head and neck. Internal jugular vein, its topography. intracranial tributaries. Sinuses of the dura mater, diploic and emissary veins. Extracranial tributaries of the internal jugular vein: facial, lingual, retromandibular vein, their tributaries and anastomoses.

7. Anterior, external and internal jugular veins. Subclavian vein, its tributaries, topography. Brachiocephalic veins, their formation, topography.

8. The main groups of lymph nodes of the head and neck. The outflow of lymph from the organs of the head and neck.

Лабораторное занятие. Common carotid artery, its topography, features of origin and topography on the right and left sides. External carotid artery, topography, anterior, medial and posterior groups of branches, variants of origin levels, blood supply areas, anastomoses.

Terminal branches. Maxillary artery, topography, parts. Blood supply to the teeth of the lower and upper jaws.

Internal carotid artery, its branches, topography, areas of blood supply. Blood supply to the brain and spinal cord. Cerebral arterial circle (circle of Willis).

Subclavian artery, topography, differences in the origin of the right and left subclavian arteries, branches and areas of blood supply.

Anastomoses between the external carotid, internal carotid, subclavian arteries.

Лабораторное занятие. Veins of head and neck. Sinuses of the dura mater, their topography. Diploic and emissary veins. Superficial and deep veins: facial, lingual, retromandibular vein, their tributaries and anastomoses.

Anterior, external and internal jugular veins. Subclavian vein, its tributaries, topography. Brachiocephalic veins, their formation, topography.

Lymphatic vessels and nodes of the head and neck. Outflow of lymph from the skin of the face, organs of the orbit, nasal cavity, salivary glands, tongue, palatine tonsils, oral mucosa, neck organs. Deep lymphatic vessels and nodes of the neck.

Лабораторное занятие. Final lesson in vessels of head and neck

## **Раздел 10. Neurology: cranial nerves and autonomic nervous system**

## **Тема 17. Cranial nerves: topography, areas of nerve supply**

Лекционное занятие. 1. General characteristics of the cranial nerves, their classification. Communication of cranial nerves with sense organs (I, II, VIII pairs), derivatives of pharyngeal arches (V, VII, IX, X, XI pairs) and spinal nerves (XI and XII pairs).

2. Anatomical and topographic characteristics of individual cranial nerves, topography of the nuclei, exit points from the brain and cranial cavity. Branches of cranial nerves, areas of their nerve supply.

Лабораторное занятие. Cranial nerves: I-IV, VI pairs. Anatomical and topographic characteristics of individual cranial nerves, topography of the nuclei, exit points from the brain and skull, their branches, areas of innervation. Vestibulocochlear nerve, its parts, topography. Localization of the vestibular and spiral ganglia in the pyramid of the temporal bone.

Trigeminal nerve, its structure, nuclei, sensory and motor roots, ganglion. Branches: ophthalmic, maxillary, mandibular nerves, their branches, position, nerve supply of the teeth of the upper and lower jaws, muscles and organs of the head and neck.

Лабораторное занятие. Facial nerve, its nuclei, topography, course in the facial canal and at the exit from it, branches, areas of nerve supply.

Glossopharyngeal, vagus, accessory nerves, their topography, places of exit from the brain and skull, course and areas of nerve supply.

Hypoglossal nerve, its topography, areas of nerve supply. The connection of the nerve with the cervical plexus (ansa cervicalis).

## **Тема 18. Autonomic nervous system: sympathetic and parasympathetic divisions. Nerve supply of the organs of head and neck**

Лекционное занятие. 1. Functions of the autonomic nervous system, its division into sympathetic and parasympathetic parts. Morphological and functional differences from the somatic nervous system. Features of the reflex arch. Localization of the centers of the autonomic nervous system in the brain and spinal cord, its peripheral parts.

2. Parasympathetic nervous system, its centers. Peripheral part of the parasympathetic part. Parasympathetic ganglia. Connection with cranial nerves.

3. The sympathetic division of the autonomic nervous system, its differences from the parasympathetic division. centers. Sympathetic chain, its divisions. Nerves extending from the cervical, thoracic, lumbar and sacral parts of the sympathetic chain. Autonomic plexi of the chest, abdomen and pelvis.

4. Autonomic nerve supply of the organs of head and neck. Nerve supply of masticatory muscles and muscles of facial expression, teeth, tongue, pharynx, larynx.

Лабораторное занятие. General principles of the structure and function of the autonomic nervous system. Division of the autonomic nervous system into sympathetic and parasympathetic parts. Centers of the autonomic nervous system in the brain and spinal cord. Peripheral division of the autonomic nervous system.

Centers of the parasympathetic nervous system. Peripheral part of the cranial part of the parasympathetic nervous system. Preganglionic and postganglionic fibers. Topography of parasympathetic fibers in the structure of the oculomotor, facial, glossopharyngeal and vagus nerves. Topography of the ciliary, pterygopalatine, otic, submandibular and sublingual ganglia, their connections with the cranial nerves. The sacral division of the parasympathetic nervous system, areas of nerve supply.

Лабораторное занятие. Final lesson in cranial nerves and autonomic nervous system

## 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:

When teaching anatomy in accordance with the requirements of FSES different educational technologies are used, aimed at the formation of competencies, which should have a graduate in the specialty "Dentistry".

Lectures on anatomy account for no more than 30% of all classroom studies. The topics of lectures precede the topics of laboratory classes. The lectures are read by the professors and associate professors of the department, accompanied by multimedia presentations with the use of interactive elements in the slides, fragments of educational films (lecture-visualization) using computer technology. For carrying out lectures the department has a multimedia projector, a set of slides on all sections and topics of the discipline prepared by lecturers.

All anatomy lab classes are equipped with anatomy sectional desks and anatomy lab workstations with obligatory usage of dry and wet anatomy tablets as well as plastinated anatomy specimens. In addition, plaster casts, tables and charts are used. The opportunities of the department's Museum of Anatomy, which has more than 1000 specimens for all anatomy disciplines, are used in the courses.

The following plan should be followed by the instructor when designing a laboratory lesson:

- 1) Organisational stage of the lesson (time - up to 5%):
  - a) checking the attendance of the trainees in the class according to the list;
  - b) motivating the topic of the laboratory session;
  - c) familiarizing the student with the objectives and plan of the lesson;
- 2) Checking and correcting the level of knowledge on the previous topic (time - up to 20%):
  - a) oral questioning on preparations;
  - b) test control of current knowledge or solution of situational tasks;
- 3) Stage of teacher's demonstration of preparations on the topic of the class (time - up to 15%);
- 4) Stage of students' independent work on anatomical specimens under the teacher's control (time - up to 45%);
- 5) Final stage of the lesson (time - up to 10%):
  - a) final control of formed theoretical knowledge, skills and abilities, including solving situational tasks;
  - b) summarizing the results of the laboratory session (teacher's evaluation of the learner's fulfilment of all objectives of the session, correction of mistakes);
  - c) familiarising the student with the homework and its requirements.

The most important stage of the laboratory lesson is the student's work with anatomical preparations. The teacher divides the students into groups of 3-4 persons so that everyone can have a good look at all the preparations. The teacher constantly monitors the quality of the student's independent work.

Active forms of learning are also used, which include the production of anatomical preparations, moulages, thematic stands by the students. No less than 5% of class time is devoted to interactive forms of training - competition between groups of students is encouraged, competitions are held for the best preparations, moulages, solving situational tasks, debates, discussions, drawing up diagrams and tables are used. During independent work, students may use Internet resources, interactive atlases and electronic textbooks on anatomy. Trainees can be involved in the preparation of computer presentations on given topics, interactive training programs, computer simulation of the human body. The

department's website is constantly updated with all the information about the department, lists of necessary educational literature, department's textbooks in electronic form, as well as all the materials for controlling the learner's knowledge.

## **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**

I semester:

1. Bone as an organ. Development and growth of bones. Classification of bones
2. Stages of bone development. Primary and secondary bones. Types of osteogenesis.
3. Classification of bone joints. Non-synovial (solid) joints, their types, examples. Hemiarthroses (symphises).
4. Classification of bone joints. Synovial joints. Main features and additional structures of synovial joints.
5. Classification of synovial joints based on the structure and shape of articular surfaces. Movements in synovial joints.
6. Muscle as an organ. Classification of muscles. Auxiliary apparatus of muscles.
7. Bones of the trunk. Structure of the vertebra, peculiarities of vertebrae, their structure in different parts of vertebral column.
8. Joints of vertebral column. Vertebral column as a whole. Physiological curvatures of vertebral column, their formation.
9. Atlanto-occipital, atlanto-axial joints. "Joint of the head".
10. Ribs, sternum, their structure, joints between them. Joints between vertebrae and ribs. Rib cage as a whole.
11. Parts of skeleton of the upper limb. Sternoclavicular joint, structure, movements.
12. Shoulder joint, structure. Muscles are acting on it, their innervation and blood supply.
13. Bones of the forearm, joints between them, joints with humerus.
14. Bones of the hand, their joints. Peculiarities of the carpometacarpal joint I.
15. "Joint of the hand". Muscles of the hand, their innervation and blood supply.
16. Bones of lower limbs skeleton. Hip joint. Muscles are acting on it, their innervation and blood supply.
17. Bones of the pelvis and their joints. Pelvis as a whole.
18. Pelvis as a whole: walls of greater and lesser pelvis, border between them. The differences of male and female pelvis. Main sizes of female pelvis.
19. Knee joint, structure, movements in the joint. Muscles are acting on it, their innervation and blood supply.
20. Bones of the leg, their joints. Talocrural joint, muscles are acting on it, their innervation and blood supply.
21. Bones of the foot. Joints of the foot bones. "Joint of the foot". Chopart's joint, Lisfrank's joint.
22. Foot arches, role of ligaments and muscles in their formation.
23. The muscles of respiration (the main respiratory muscles and additional respiratory muscles), their innervation and blood supply.
24. Diaphragm: structure, functions, blood supply and innervation.
25. Axillary cavity, walls, triangles, openings, contents.
26. Muscles of the shoulder girdle and brachium, their blood supply and innervation.
27. Anterior group muscles of the forearm, their blood supply and innervation. Synovial sheath in the regions of wrist and hand.
28. Posterior group of muscles of the forearm, their blood supply and innervation.

Tendon sheaths of wrist region.

29. Muscles of the abdomen, their innervation and blood supply. Sheath of rectus abdominis muscle.

30. Linea alba of an abdomen. Weak points of the abdomen.

31. Inguinal canal, its contents, walls, superficial and deep rings.

32. Superficial and deep muscles of the back. Their blood supply and innervation

33. Muscles of the thigh, their blood supply and innervation.

34. Muscular and vascular lacunae. Fasciae of the thigh. Hiatus saphenus (oval fossa).

Femoral canal.

35. Posterior and lateral groups of the leg muscles, their blood supply and innervation.

36. Anterior group of the leg muscles, their blood supply and innervation. Tendon and synovial sheaths of foot region.

37. Muscles of the foot, their blood supply and innervation.

II semester:

1. Parts of digestive system. Structure of the digestive tube wall. Structural features of mucous tunic in different parts.

2. Parts of digestive tract. Muscular tunic features in different parts of digestive tract. Sphincters and their significance.

3. Oesophagus: topography, constrictions. Structure of the wall, blood supply and innervation.

4. Stomach: topography, structure, functions, blood supply, lymphatic drainage.

5. Stomach: topography, parts, structure of the wall. Innervation of the stomach.

6. Duodenum. Topography, parts, structural features of the wall, functions, blood supply and innervation.

7. Mesenteric part of small intestine, its parts. Structural features of the wall, functions. Blood supply, lymphatic drainage, innervation.

8. Large intestine, its parts. Structural features, functions, blood supply and innervation of colon.

9. Caecum and appendix: topography, structural features, blood supply and innervation.

10. Rectum: topography, structural features, functions, blood supply, innervation, lymphatic drainage.

11. Liver: topography, structure, functions. Morphofunctional unit of liver. Blood supply, innervation, lymphatic drainage.

12. Liver: topography, borders, structure, functions. The porta hepatis (transverse hepatic fissure), what it contains. Peculiarities of blood supply.

13. Gall bladder, topography and structure, excretory ducts of liver and gall bladder. Blood supply and innervation.

14. Pancreas: topography, structure, functions, blood supply and innervation.

15. Peritoneum, peritoneal cavity. Topography of peritoneum in superior floor: bursae, their walls, communications.

16. Peritoneum, peritoneal cavity. Topography of peritoneum in the middle floor of peritoneal cavity: canals and sinuses. Course of peritoneum in true pelvis.

17. Respiratory system, its parts. Structural features of respiratory tract walls.

18. Trachea and principal bronchi. Bronchial tree. Blood supply and innervation.

19. Lungs: external and internal structure. Morphofunctional unit of lungs. Borders of lungs. Blood supply, innervation, lymphatic drainage.

20. Pleura. Borders of pleura. Pleural cavity, sinuses of pleura, their significance.

21. Mediastinum. Components of anterior and posterior mediastinum.

22. Kidneys: topography, fixation apparatus, structure, functions.
23. Kidneys: morphofunctional unit, calices-pelvis system. Blood supply and innervation of the kidney.
24. Ureters: topography, parts, constrictions, structure. Blood supply and innervation.
25. Urinary bladder: topography, structure, blood supply and innervation.
26. Urethra. Structural features and functions in male and female organisms.
27. Testis: structure, membranes, functions, blood supply and innervation. Process of testicular descent.
28. Deferent duct, seminal vesicles, prostatic gland. Their structure, functions, blood supply and innervation.
29. External male genital organs. Blood supply and innervation.
30. External female genital organs. Blood supply and innervation.
31. Uterus: topography, structure, functions, blood supply and innervation. Lymphatic drainage.
32. Ovary: structure, topography, functions. Blood supply and innervation. Lymphatic drainage.
33. Mammary gland: development, topography, structure, blood supply, lymphatic drainage.
34. Cardiovascular system and its components. Arteries, veins, capillaries, structural features of the walls.
35. Heart: topography, external structure, borders. Blood supply and innervation of the heart.
36. Heart: chambers, valve apparatus. Conduction system. Pericardium.
37. Systemic and pulmonary circulations. Peculiarities of fetal blood circulation.
38. Aorta, its parts, their topography. Aortic arch branches. Vessels of pulmonary circulation.
39. Axillary artery, its topography and branches. Arterial net of a shoulder joint.
40. Brachial artery, its topography, branches. Arterial net of an elbow joint.
41. Arteries of forearm and hand. Formation of superficial and deep palmar arches.
42. Superficial and deep veins of an upper limb.
43. Thoracic aorta, topography, branches, regions of blood supply.
44. Abdominal aorta, topography. Unpaired visceral branches, regions of blood supply.
45. Abdominal aorta: parietal and visceral branches, regions of blood supply.
46. Veins of posterior mediastinum: azygos, hemiazygos veins, their formation, path, inflows, drain.
47. Portal vein, its formation, path, significance. Porto-caval anastomoses.
48. Superior vena cava: formation, topography, inflows. Cava-caval anastomoses.
49. Inferior vena cava: formation, path, inflows. Cava-caval anastomoses.
50. Common and internal iliac arteries. Their path and branches.
51. External iliac artery. Femoral artery. Topography, branches.
52. Popliteal artery, its topography, branches. Arterial net of knee joint.
53. Arteries of leg and foot, topography, regions of blood supply.
54. Superficial and deep veins of lower limbs.
55. Arterial and venous anastomoses in vascular system, their significance.

### III semester:

1. Bones of viscerocranium
2. Temporo-mandibular joint, its features, innervation, blood supply.
3. Orbit: structure of walls, openings, contents.
4. Bones of neurocranium. Cranial vault and cranial base, border between them.

5. Temporal bone: structure, canals (musculotubar, carotid, canal of facial nerve)
6. Internal cranial base. Cranial fossae: walls, borders, openings
7. External cranial base, openings and their contents
8. Pneumatized bones of skull, their structure and significance.
9. Temporal, infratemporal and pterygopalatine fossae, their walls and openings.
10. Development of neurocranium and viscerocranium. Especial features of newborn's skull. Types of joints between the skull bones. Types of sutures.
11. Masticatory muscles. Structural features, blood supply and innervation.
12. Mimic muscles. Structural features, innervation and blood supply.
13. Muscles of the neck. Regions and triangles of the neck.
14. Fasciae of the neck and interfascial spaces by Shevkunenko V.N.
15. Oral cavity, structure of the walls, parts. Fauces. Lymphoepithelial ring, its significance.
16. Tongue: structure, functions. Muscles of the tongue. Blood supply.
17. Tongue, structural features of mucous membrane. Innervation of the tongue.
18. Tooth structure. Decidua (milk) and permanent teeth. Dental formulae. Blood supply and innervation of teeth.
19. Common anatomy of tooth. Hard tooth tissue. Cement and its development, structure.
20. Common anatomy of tooth. Tooth pulp, its development, structure and function.
21. The structure and function of the supporting apparatus of the tooth.
22. Periodontium, its structure and function.
23. Tooth system as a whole (arc, teeth-antagonists and antimeres).
24. Full and group formula of milk and permanent teeth.
25. The surface of the tooth crown. Signs of teeth.
26. Occlusion and its types. Articulation. Physiological and pathological occlusion.
27. The incisors: structure, characteristics.
28. Canines: structure, characteristics.
29. The premolars, their structure.
30. The molars, their structure.
31. Blood supply and innervation of the upper teeth. Lymphatic drainage.
32. Blood supply and innervation of the lower teeth. Lymphatic drainage.
33. Common carotid and external carotid arteries. Topography, anterior, medial and posterior groups of branches, regions of blood supply.
34. Terminal branches of external carotid artery, regions of blood supply.
35. Maxillary artery: parts, branches, regions of blood supply.
36. Internal carotid artery. Topography. Branches and regions of blood supply.
37. Anastomoses between branches of external carotid, internal carotid and subclavian arteries.
- Blood supply of brain and spinal cord. Cerebral arterial circle.
38. Internal jugular vein, its formation and path . Extra- and intracranial inflows, their anastomoses.
39. External and anterior jugular veins, their topography, drain. Brachiocephalic veins, their formation, topography.
40. Subclavian artery, topography, branches, regions of blood supply.
41. Regional lymph nodes of the head, their topography. Lymphatic drainage of head organs.
42. Regional lymph nodes of the head, their topography. Lymphatic drainage of neck organs.
43. Olfactory analyzer, its parts. I pair of cranial nerves.

44. Optic analyzer, its parts. II pair of cranial nerves.
  45. Eyeball, its coats, nucleus. Outflow of Aqueous Humour.
  46. Auxiliary apparatus of an eye. Blood supply of organ of vision.
  47. III, IV and VI pairs of cranial nerves.
  48. V pair of cranial nerves. Topography of the 1st branch, regions of innervation.
  49. V pair of cranial nerves. Topography of the 2nd branches, regions of innervation.
  50. V pair of cranial nerves. Topography of the 3rd branch, regions of innervation.
  51. VII pair of cranial nerves.
  52. Auditory analyzer, its parts. VIII pair of cranial nerves.
  53. External and middle ear, they parts, structure, functions.
  54. Internal ear, its parts, structure, functions.
  55. IX pair of cranial nerves.
  56. X pair of cranial nerves. Branches of cranial and cervical parts.
  57. X pair of cranial nerves. Branches of thoracic and abdominal parts.
  58. XI and XII pairs of cranial nerves.
  59. Relation of the cranial nerves with the autonomic nervous system. The parasympathetic nodes in the head region. Pre- and postganglionic parasympathetic fibers, their course, connections, regions of innervation.

## **6.2. Sample list of questions for the examination**

### **QUESTIONS IN ANATOMY EXAM FOR MEDICAL STUDENTS**

#### **I. GENERAL QUESTIONS**

1. The object and purpose of anatomy. Anatomy between the others biological subjects. The value of anatomy for study the clinical disciplines. Methods of study in anatomy.
2. Pre-scientific period of anatomy development. Anatomical heritage of ancient Egypt, Greece, Rome. Works of Hippocrates, Aristotle. The period of the primitive science in anatomy: the works of Galen, Avicenna, Leonardo da Vinci.
3. The development of scientific anatomy at 16th-17th centuries: the value of the works of A. Vesalius, Harvey B. et al.
4. The history of the anatomy in Russia. Prof. N.I. Pirogov, V.N. Tonkov, D.A. Jhdanov, V.N. Shevkunenko.
5. Axes and planes in anatomy. Imaginary lines on the body surface, their significance.
6. Tissues, organs, systems of organs. Individual variation of organs. Norm, variants of norm, anomalies. Examples.
7. Main stages of embryogenesis. Embryonic layers and their derivatives.

#### **II. LOCOMOTOR APPARATUS**

1. Bone as an organ. Development and growth of bones. Classification of bones
2. Stages of bone development. Primary and secondary bones. Types of osteogenesis.
3. Classification of bone joints. Non-synovial (solid) joints, their types, examples. Hemiarthroses (symphises).
4. Classification of bone joints. Synovial joints. Main features and additional

structures of synovial joints.

5. Classification of synovial joints based on the structure and shape of articular surfaces.

Movements in synovial joints.

6. Muscle as an organ. Classification of muscles. Auxiliary apparatus of muscles.

7. Bones of viscerocranium

8. Temporo-mandibular joint, its features, innervation, blood supply.

9. Orbit: structure of walls, openings, contents.

10. Bones of neurocranium. Cranial vault and cranial base, border between them.

11. Temporal bone: structure, canals (musculotubar, carotid, canal of facial nerve)

12. Internal cranial base. Cranial fossae: walls, borders, openings

13. External cranial base, openings and their contents

14. Pneumatized bones of skull, their structure and significance.

15. Temporal, infratemporal and pterygopalatine fossae, their walls and openings.

16. Development of neurocranium and viscerocranium. Especial features of newborn's skull. Types of joints between the skull bones. Types of sutures.

17. Bones of the trunk. Structure of the vertebra, peculiarities of vertebrae, their structure in different parts of vertebral column.

18. Joints of vertebral column. Vertebral column as a whole. Physiological curvatures of vertebral column, their formation.

19. Atlanto-occipital, atlanto-axial joints. "Joint of the head".

20. Ribs, sternum, their structure, joints between them. Joints between vertebrae and ribs.

Rib cage as a whole.

21. Parts of skeleton of the upper limb. Sternoclavicular joint, structure, movements.

22. Shoulder joint, structure. Muscles are acting on it, their innervation and blood supply.

23. Bones of the forearm, joints between them, joints with humerus.

24. Bones of the hand, their joints. Peculiarities of the carpometacarpal joint I.

25. "Joint of the hand". Muscles of the hand, their innervation and blood supply.

26. Bones of lower limbs skeleton. Hip joint. Muscles are acting on it, their innervation and blood supply.

27. Bones of the pelvis and their joints. Pelvis as a whole.

28. Pelvis as a whole: walls of greater and lesser pelvis, border between them. The differences of male and female pelvis. Main sizes of female pelvis.

29. Knee joint, structure, movements in the joint. Muscles are acting on it, their innervation and blood supply.

30. Bones of the leg, their joints. Talocrural joint, muscles are acting on it, their innervation and blood supply.

31. Bones of the foot. Joints of the foot bones. "Joint of the foot". Chopart's joint, Lisfrank's joint.

32. Foot arches, role of ligaments and muscles in their formation.

33. Masticatory muscles. Structural features, blood supply and innervation.

34. Mimic muscles. Structural features, innervation and blood supply.

35. Muscles of the neck. Regions and triangles of the neck.

36. Fasciae of the neck and interfascial spaces by Shevkunenko V.N.

37. The muscles of respiration (the main respiratory muscles and additional respiratory muscles), their innervation and blood supply.

38. Diaphragm: structure, functions, blood supply and innervation.

39. Axillary cavity, walls, triangles, openings, contents.

40. Muscles of the shoulder girdle and brachium, their blood supply and innervation.

41. Anterior group muscles of the forearm, their blood supply and innervation. Synovial sheath in the regions of wrist and hand.

42. Posterior group of muscles of the forearm, their blood supply and innervation.

Tendon sheaths of wrist region.

43. Muscles of the abdomen, their innervation and blood supply. Sheath of rectus abdominis muscle.

44. Linea alba of an abdomen. Weak points of the abdomen.

45. Inguinal canal, its contents, walls, superficial and deep rings.

46. Superficial and deep muscles of the back. Their blood supply and innervation

47. Muscles of the thigh, their blood supply and innervation.

48. Muscular and vascular lacunae. Fasciae of the thigh. Hiatus saphenus (oval fossa).

Femoral canal.

49. Posterior and lateral groups of the leg muscles, their blood supply and innervation.

50. Anterior group of the leg muscles, their blood supply and innervation. Tendon and synovial sheaths of foot region.

51. Muscles of the foot, their blood supply and innervation.

52. Perineum. Urogenital triangle, muscles and fasciae. Urogenital diaphragm. Blood supply and innervation of perineal muscles.

53. Perineum. Anal triangle, muscles and fasciae. Pelvic diaphragm. Ischio-rectal fossa. Blood supply and innervation of perineal muscles.

### III. SPLANCHNOLOGY

1. Parts of digestive system. Structure of the digestive tube wall. Structural features of mucous tunic in different parts.

2. Parts of digestive tract. Muscular tunic features in different parts of digestive tract. Sphincters and their significance.

3. Oral cavity, structure of the walls, parts. Fauces. Lymphoepithelial ring, its significance.

4. Tongue: structure, functions. Muscles of the tongue. Blood supply.

5. Tongue, structural features of mucous membrane. Innervation of the tongue.

6. Tooth structure. Deciduous (milk) and permanent teeth. Dental formulae. Blood supply and innervation of teeth.

7. Oesophagus: topography, constrictions. Structure of the wall, blood supply and innervation.

8. Stomach: topography, structure, functions, blood supply, lymphatic drainage.

9. Stomach: topography, parts, structure of the wall. Innervation of the stomach.

10. Duodenum. Topography, parts, structural features of the wall, functions, blood supply and innervation.

11. Mesenteric part of small intestine, its parts. Structural features of the wall, functions. Blood supply, lymphatic drainage, innervation.

12. Large intestine, its parts. Structural features, functions, blood supply and innervation of colon.

13. Caecum and appendix: topography, structural features, blood supply and innervation.

14. Rectum: topography, structural features, functions, blood supply, innervation, lymphatic drainage.

15. Liver: topography, structure, functions. Morphofunctional unit of liver. Blood supply, innervation, lymphatic drainage.

16. Liver: topography, borders, structure, functions. The porta hepatis (transverse hepatic fissure), what it contains. Peculiarities of blood supply.

17. Gall bladder, topography and structure, excretory ducts of liver and gall bladder. Blood supply and innervation.

18. Pancreas: topography, structure, functions, blood supply and innervation.

19. Peritoneum, peritoneal cavity. Topography of peritoneum in superior floor:

bursae, their walls, communications.

20. Peritoneum, peritoneal cavity. Topography of peritoneum in the middle floor of peritoneal cavity: canals and sinuses. Course of peritoneum in true pelvis.

21. Respiratory system, its parts. Structural features of respiratory tract walls.

22. Trachea and principal bronchi. Bronchial tree. Blood supply and innervation.

23. Lungs: external and internal structure. Morphofunctional unit of lungs. Borders of lungs. Blood supply, innervation, lymphatic drainage.

24. Pleura. Borders of pleura. Pleural cavity, sinuses of pleura, their significance.

25. Mediastinum. Components of anterior and posterior mediastinum.

26. Kidneys: topography, fixation apparatus, structure, functions.

27. Kidneys: morphofunctional unit, calices-pelvis system. Blood supply and innervation of the kidney.

28. Ureters: topography, parts, constrictions, structure. Blood supply and innervation.

29. Urinary bladder: topography, structure, blood supply and innervation.

30. Urethra. Structural features and functions in male and female organisms.

31. Testis: structure, membranes, functions, blood supply and innervation. Process of testicular descent.

32. Deferent duct, seminal vesicles, prostatic gland. Their structure, functions, blood supply and innervation.

33. External male genital organs. Blood supply and innervation.

34. External female genital organs. Blood supply and innervation.

35. Uterus: topography, structure, functions, blood supply and innervation. Lymphatic drainage.

36. Ovary: structure, topography, functions. Blood supply and innervation. Lymphatic drainage.

37. Mammary gland: development, topography, structure, blood supply, lymphatic drainage.

#### IV. ENDOCRINE GLANDS

1. Thyroid, parathyroid gland and thymus: topography, structure and functions, blood supply and innervation.

2. Hypophysis and epiphysis: topography, structure, functions.

3. Adrenal glands: topography, structure, functions, blood supply and innervation.

#### V. CARDIOVASCULAR SYSTEM

1. Cardiovascular system and its components. Arteries, veins, capillaries, structural features of the walls.

2. Heart: topography, external structure, borders. Blood supply and innervation of the heart.

3. Heart: chambers, valve apparatus. Conduction system. Pericardium.

4. Systemic and pulmonary circulations. Peculiarities of fetal blood circulation.

5. Aorta, its parts, their topography. Aortic arch branches. Vessels of pulmonary circulation.

6. Axillary artery, its topography and branches. Arterial net of a shoulder joint.

7. Brachial artery, its topography, branches. Arterial net of an elbow joint.

8. Arteries of forearm and hand. Formation of superficial and deep palmar arches.

9. Superficial and deep veins of an upper limb.
  10. Thoracic aorta, topography, branches, regions of blood supply.
  11. Abdominal aorta, topography. Unpaired visceral branches, regions of blood supply.
  12. Abdominal aorta: parietal and visceral branches, regions of blood supply.
  13. Veins of posterior mediastinum: azygos, hemiazygos veins, their formation, path, inflows, drain.
  14. Portal vein, its formation, path, significance. Porto-caval anastomoses.
  15. Superior vena cava: formation, topography, inflows. Cava-caval anastomoses.
  16. Inferior vena cava: formation, path, inflows. Cava-caval anastomoses.
  17. Common and internal iliac arteries. Their path and branches.
  18. External iliac artery. Femoral artery. Topography, branches.
  19. Popliteal artery, its topography, branches. Arterial net of knee joint.
  20. Arteries of leg and foot, topography, regions of blood supply.
  21. Superficial and deep veins of lower limbs.
  22. Arterial and venous anastomoses in vascular system, their significance.
  23. Lymphatic system, its components, functions, significance in norm and pathology.
  24. Lymph nodes, their structure, functions. Main groups of regional lymph nodes of the head, neck, body cavities, limbs.
  25. Thoracic and right lymphatic ducts, their topography, path, drain, regions of lymph drainage.
  26. Spleen: topography, structure, functions, blood supply and innervation.

## VI. NERVOUS SYSTEM

1. Development of nervous system. Functions of nervous system. Morphofunctional unit of nervous system. Neuroglia.
2. Classification of neurons based on their structure and functions. Nerve fibers, nerve endings. Reflex arc.
3. Spinal cord: topography, external and internal structure.
4. Segment of spinal cord. Formation of spinal nerve, its branches.
5. Meninges of spinal cord. Intermeningeal spaces and their contents.
6. Base of brain, emerge of cranial nerve roots from the brain and from the skull.
7. Rhombencephalon, its parts. Medulla oblongata: borders, external and internal structure.
8. Cerebellum and pons: borders, external and internal structure.
9. Rhomboid fossa, formation, projection of cranial nerves nuclei. IV ventricle, its walls and communications.
10. Midbrain: borders, external and internal structure.
11. Diencephalon: parts, structure, functions. III ventricle.
12. Telencephalon, its parts. Lobes of hemispheres, sulci and gyri of dorsolateral surface.
13. Telencephalon. Lobes of hemispheres, sulci and gyri of medial and inferior surfaces.
14. Telencephalon. Cortical analyzers. Localization of the most important centers in cortex of cerebral hemispheres.
15. Telencephalon. Basal nuclei. Internal capsule. Lateral ventricles, their parts, walls.
16. Meninges of the brain, structural features, sinuses of dura mater.
17. Intermeningeal spaces of spinal cord and brain, cisterns. Formation of cerebrospinal fluid, ways of circulation and outflow.

18. Exteroceptive neural pathways.
  19. Conscious and unconscious proprioceptive neural pathways.
  20. Pyramid neural pathways.
  21. Extrapramid system. Extrapramid neural pathways.
  22. Autonomic nervous system, functions, structural features. Differences between autonomic and somatic reflex arcs.
  23. Parasympathetic division of autonomic nervous system, central and peripheral part, functions. Parasympathetic nodes, their topography.
  24. Sympathetic division of autonomic nervous system, central and peripheral parts, functions. Sympathetic trunk. Autonomic plexi of abdominal cavity and pelvis.
  25. Cervical plexus: formation, topography, branches, regions of innervation.
  26. Brachial plexus: formation, topography. Short branches.
  27. Brachial plexus: formation, topography. Long branches.
  28. Ventral branches of thoracic spinal nerves. Dorsal branches of spinal nerves.
  29. Innervation of muscles and skin of upper limbs.
  30. Lumbar plexus: formation, topography, branches.
  31. Sacral plexus: formation, topography, branches.
  32. Innervation of muscles and skin of lower limbs.

## VI. HEAD AND NECK ANATOMY

1. Skull: parts, development, age, gender and individual characteristics of the skull.
2. Bones of neurocranium. Calvaria and base of the skull, the borders between them.
3. Temporal bone anatomy and its canals.
4. Bones of viscerocranium.
5. Orbita, its walls, communications and its contents.
6. Maxilla, age characteristics. Dental buttresses.
7. Mandible, age characteristics. Mandible canal. Dental buttresses.
8. Temporal fossa, infratemporal fossa, pterigopalatine fossa. Their walls, openings and contents.
9. Internal cranial base. Cranial fossae, formation of the walls, openings.
10. External cranial base. Openings and they content.
11. Pneumatic skull bones, they structure and function.
12. Temporo-mandibular joint, its structure, movements, blood supply and innervations.
13. The mastication muscles: development, structural features, function, blood supply and innervation. The masticatory force.
14. The mimic muscles: development, function, blood supply and innervation.
15. The superficial neck muscles. They topography, blood supply and innervation.
16. The deep neck muscles. They topography, blood supply and innervation.
17. Neck topography: regions, triangles. Fasciae of the neck by V.N. Shevkunenko. Neck fascial spaces.
18. Oral cavity: development and regions. The structure of the cheeks, the upper and lower lips. Oral diaphragm.
19. The walls of the oral cavity. The borders of the fauces. Waldeyer's tonsillar ring, its meaning.
20. The hard and soft palate, its blood supply and innervation.
21. The tongue structure and functions. Muscles of the tongue, its blood supply.
22. Tongue, structural features of mucous membrane. Tongue innervation.
23. Development of teeth: the first, second and third stages.
24. Chewing-speech apparatus, parts, function.

25. The concept of dentoalveolar segment. Dentoalveolar segments of the upper and lower jaws.
  26. Age of primary teeth eruption. The differences between the permanent and milk teeth.
- Dental formula of milk teeth.
27. Age of permanent teeth eruption. The differences between the permanent and milk teeth. Dental formula of permanent teeth.
  28. Common anatomy of tooth. Hard tooth tissue. Dentin and its development, structure.
  29. Common anatomy of tooth. Hard tooth tissue. Enamel and its development, structure. Types of cement-enamel junctions.
  30. Common anatomy of tooth. Hard tooth tissue. Cement and its development, structure.
  31. Common anatomy of tooth. Tooth pulp, its development, structure and function.
  32. The structure and function of the supporting apparatus of the tooth.
  33. Periodontium, its structure and function.
  34. Tooth system as a whole (arc, teeth-antagonists and antimeres).
  35. Full and group formula of milk and permanent teeth.
  36. The surface of the tooth crown. Signs of teeth.
  37. Occlusion and its types. Articulation. Physiological and pathological occlusion.
  38. The incisors: structure, characteristics.
  39. Canines: structure, characteristics.
  40. The premolars, their structure.
  41. The molars, their structure.
  42. Blood supply and innervation of the upper teeth. Lymphatic drainage.
  43. Blood supply and innervation of the lower teeth. Lymphatic drainage.
  44. Parotid gland: topography, course and ductal junction, blood supply and innervation, lymphatic drainage. Minor salivary glands, their topography.
  45. Submandibular and sublingual salivary glands: their topography, ducts, blood supply and innervation, lymphatic drainage.
- and
46. Pharynx: topography, parts, structure. Lymphoepithelial ring. Blood supply and innervation of the pharynx.
- innervation, lymphatic drainage.
47. External nose. Nasal cavity: structure of the walls, nasal passages and their communications, blood supply and innervation.
  48. Larynx as an air-conducting organ. Cartilages of larynx, their joints. Blood supply and innervation of larynx.
  49. Larynx as a speech-producing organ. Cavity of larynx, vocal folds (true and false).
- Vocal
- fissure. Muscles of larynx.
  50. Common carotid and external carotid arteries. Topography, anterior, medial and posterior groups of branches, regions of blood supply.
  51. Terminal branches of external carotid artery, regions of blood supply.
  52. Maxillary artery: parts, branches, regions of blood supply.
  53. Internal carotid artery. Topography. Branches and regions of blood supply.

54. Anastomoses between branches of external carotid, internal carotid and subclavian arteries.  
Blood supply of brain and spinal cord. Cerebral arterial circle.
55. Internal jugular vein, its formation and path . Extra- and intracranial inflows, their anastomoses.
56. External and anterior jugular veins, their topography, drain. Brachiocephalic veins, their formation, topography.
57. Subclavian artery, topography, branches, regions of blood supply.
58. Regional lymph nodes of the head, their topography. Lymphatic drainage of head organs.
59. Regional lymph nodes of the head, their topography. Lymphatic drainage of neck organs.
60. Olfactory analyzer, its parts. I pair of cranial nerves.
61. Optic analyzer, its parts. II pair of cranial nerves.
62. Eyeball, its coats, nucleus. Outflow of Aqueous Humour.
63. Auxiliary apparatus of an eye. Blood supply of organ of vision.
64. III, IV and VI pairs of cranial nerves.
65. V pair of cranial nerves. Topography of the 1st branch, regions of innervation.
66. V pair of cranial nerves. Topography of the 2nd branches, regions of innervation.
67. V pair of cranial nerves. Topography of the 3rd branch, regions of innervation.
68. VII pair of cranial nerves.
69. Auditory analyzer, its parts. VIII pair of cranial nerves.
70. External and middle ear, they parts, structure, functions.
71. Internal ear, its parts, structure, functions.
72. IX pair of cranial nerves.
73. X pair of cranial nerves. Branches of cranial and cervical parts.
74. X pair of cranial nerves. Branches of thoracic and abdominal parts.
75. XI and XII pairs of cranial nerves.
76. Relation of the cranial nerves with the autonomic nervous system. The parasympathetic nodes in the head region. Pre- and postganglionic parasympathetic fibers, their course, connections, regions of innervation.

### **6.3. Suggested themes of term papers (projects)**

Coursework is not included

### **6.4. Suggested themes of term projects**

not included

### **6.5. Suggested topics of calculation and graphic works**

not included

## **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

1. Charter of FSBEI HE "Chuvash State University named after I.N. Ulyanov" dated December 27, 2018

2. The order of organization and implementation of educational activities for educational programs of higher education - undergraduate programs, specialist's programs, master's programs

3. Regulations on the organization and implementation of educational activities in educational programs of higher education - bachelor's programs, specialist's programs, master's programs in the federal state budgetary educational institution of higher education "Chuvash State University named after I.N. Ulyanov"

4. Regulations on the contact work of students with teaching staff and (or) persons involved in the implementation of educational programs on other terms in the Federal State Budgetary Educational Institution of Higher Education "Chuvash State University named after I.N. Ulyanov"

5. Regulations on the mode of employment of students in the Federal State Budgetary Educational Institution of Higher Education "Chuvash State University named after I.N. Ulyanov"

6. Regulations on the development and content of the work programs of disciplines in the Federal State Budgetary Educational Institution of Higher Education "Chuvash State University named after I.N. Ulyanov"

7. Regulations on the formation of evaluation materials (assessment funds fund) for conducting intermediate certification of students in the academic discipline at the Federal State Budgetary Educational Institution of Higher Education "Chuvash State University named after I.N. Ulyanov"

### 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	Арутюнов С.Д., Анатомия, физиология и биомеханика зубочелюстной системы / под ред. С.Д. Арутюнова, Л.Л. Колесникова, В.П. Дегтярёва, И.Ю. Лебедеенко - М. : ГЭОТАР-Медиа, 2017. - 328 с. - ISBN 978-5-9704-3870-1 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="http://www.studentlibrary.ru/book/ISBN9785970438701.html">http://www.studentlibrary.ru/book/ISBN9785970438701.html</a> (дата обращения: 16.06.2019).	<a href="http://www.studentlibrary.ru/book/ISBN9785970438701.html">http://www.studentlibrary.ru/book/ISBN9785970438701.html</a>

2	<p>Баженов Д.В., Анатомия головы и шеи. Введение в клиническую анатомию / Баженов Д.В., Калиниченко В.М. - М. : ГЭОТАР-Медиа, 2014. - 464 с. - ISBN 978-5-9704-3098-9 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="http://www.studentlibrary.ru/book/ISBN9785970430989.html">http://www.studentlibrary.ru/book/ISBN9785970430989.html</a> (дата обращения: 16.06.2019).</p>	<p><a href="http://www.studentlibrary.ru/book/ISBN9785970430989.html">http://www.studentlibrary.ru/book/ISBN9785970430989.html</a></p>
3	<p>Сапин М.Р., Атлас анатомии человека для стоматологов / Сапин М.Р., Никитюк Д.Б., Литвиненко Л.М. - М. : ГЭОТАР- Медиа, 2013. - 600 с. - ISBN 978-5-9704- 2489-6 - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="http://www.studentlibrary.ru/book/ISBN9785970424896.html">http://www.studentlibrary.ru/book/ISBN9785970424896.html</a> (дата обращения: 16.06.2019).</p>	<p><a href="http://www.studentlibrary.ru/book/ISBN9785970424896.html">http://www.studentlibrary.ru/book/ISBN9785970424896.html</a></p>
4	<p>Онлайн-тесты по анатомии. – Текст : электронный // Онлайн-тесты [сайт]. – URL: <a href="http://oltest.ru/tests/medicina/anatomiya/">http://oltest.ru/tests/medicina/anatomiya/</a></p>	<p><a href="http://oltest.ru/tests/medicina/anatomiya/">http://oltest.ru/tests/medicina/anatomiya/</a></p>
5	<p>Литвиненко, Л. М. Анатомия человека. Атлас для стоматологов, стоматологов-ортопедов / Л. М. Литвиненко, Д. Б. Никитюк - Москва : Литтерра, 2017. - 656 с. - ISBN 978-5-4235-0230-0. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="https://www.studentlibrary.ru/book/ISBN9785423502300.html">https://www.studentlibrary.ru/book/ISBN9785423502300.html</a> (дата обращения: 20.01.2021). - Режим доступа : по подписке.</p>	<p><a href="https://www.studentlibrary.ru/ru/book/ISBN9785423502300.html">https://www.studentlibrary.ru/ru/book/ISBN9785423502300.html</a></p>
6	<p>Колесников, Л. Л. Анатомия человека : атлас : в 3 т. Т. 1. Остеология, артросиндесмология, миология : атлас / Колесников Л. Л. - Москва : ГЭОТАР-Медиа, 2018. - 480 с. - ISBN 978-5-9704-4925-7. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="https://www.studentlibrary.ru/book/ISBN9785970449257.html">https://www.studentlibrary.ru/book/ISBN9785970449257.html</a> (дата обращения: 20.01.2021). - Режим доступа : по подписке.</p>	<p><a href="https://www.studentlibrary.ru/ru/book/ISBN9785970449257.html">https://www.studentlibrary.ru/ru/book/ISBN9785970449257.html</a></p>

7	Колесников, Л. Л. Анатомия человека : атлас : в 3 т. Т. 2. Спланхнология / Колесников Л. Л. - Москва : ГЭОТАР-Медиа, 2018. - ISBN 978-5-9704-4175-6. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="https://www.studentlibrary.ru/book/ISBN9785970441756.html">https://www.studentlibrary.ru/book/ISBN9785970441756.html</a> (дата обращения: 20.01.2021). - Режим доступа : по подписке.	<a href="https://www.studentlibrary.ru/ru/book/ISBN9785970441756.html">https://www.studentlibrary.ru/ru/book/ISBN9785970441756.html</a>
8	Колесников, Л. Л. Анатомия человека : атлас : в 3 т. Т. 3. Неврология, эстеziология : атлас / Колесников Л. Л. - Москва : ГЭОТАР-Медиа, 2018. - 624 с. - ISBN 978-5-9704-4176-3. - Текст : электронный // ЭБС "Консультант студента" : [сайт]. - URL : <a href="https://www.studentlibrary.ru/book/ISBN9785970441763.html">https://www.studentlibrary.ru/book/ISBN9785970441763.html</a> (дата обращения: 20.01.2021). - Режим доступа : по подписке.	<a href="https://www.studentlibrary.ru/ru/book/ISBN9785970441763.html">https://www.studentlibrary.ru/ru/book/ISBN9785970441763.html</a>

### **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/](http://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, переносное мультимедийное оборудование (проектор, экран, ноутбук), манекен, скелет, анатомический стол, ванна, каталка
2		Учебная аудитория для занятий семинарского типа, текущего контроля и промежуточной аттестации. Оборудование: учебная доска, учебная мебель, переносное мультимедийное оборудование (проектор, экран, ноутбук), анатомический стол, ванна
3		Учебная аудитория для занятий семинарского типа, текущего контроля и промежуточной аттестации. Оборудование: учебная доска, учебная мебель, переносное мультимедийное оборудование (проектор, экран, ноутбук), анатомический стол
4		Помещение для самостоятельной работы обучающихся. Оборудование: компьютерная техника с подключением к сети Интернет и доступом к электронной информационно-образовательной среде ФГБОУ ВО «Чувашский государственный университет имени И.Н. Ульянова»
5	Лек	Учебные аудитории для занятий лекционного типа, семинарского типа. Оборудование: учебная доска, учебная мебель, мультимедийное оборудование (проектор, экран, персональный компьютер или ноутбук с необходимым программным обеспечением для тематических иллюстраций и демонстраций, соответствующих программе дисциплины)

## **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.

Independent work is determined by the specifics of the discipline and the methodology of its teaching, the time provided by the curriculum, as well as the level of study at which the discipline is studied.

The following sources can be recommended for self-study: lecture notes and/or practical and laboratory classes, educational literature of the relevant profile.

The teacher at the beginning of the course informs students about the forms, types and content of independent work, explains the requirements for the results of independent work, as well as forms and methods of control and evaluation criteria.

The forms of independent extracurricular work of students on anatomy include:

1. Preparation and production of anatomical specimens, models, plates, charts and graphs.

2. Self-study of students on training topics and issues included in the list of topics for independent study.

3. Preparation of anatomical preparations by students in their free time for laboratory studies and at the anatomical museum.

4. Familiarize students with additional training literature and other training aids on anatomy (eAtlases, training videos, etc.)

5. Participation in preparation of presentations, interactive training programs on anatomy, computer simulation of organs.

The department has organized dry and wet anatomical preparations up to 19 hours for students to work independently, and has an academic anatomy museum. In addition, students can use Internet resources, electronic medical library, with questions for self-monitoring students can find on the website of the department.

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

Anatomy is taught in class (lectures and laboratories) as well as extracurricular self-study.

Lectures on anatomy account for no more than 30% of all classroom studies. The topics of lectures precede the topics of laboratory classes, and the most complex and important issues are addressed at these lectures. The lectures are read by professors and associate professors of the department and are accompanied by multimedia presentations using interactive elements in slides, fragments of educational films (lecture-visualization) using computer technology.

The laboratory lesson is one of the forms of learning activities, which aims to consolidate the theoretical material studied, its deeper absorption and formation of the ability to apply theoretical knowledge in a practical, applied purpose. Special attention in laboratory classes is paid to the development of study or professional skills. Such skills are formed in the process of carrying out specific tasks - exercises, tasks, etc. - under the guidance and control of the teacher. The main objective of laboratory classes is to develop skills and practical experience aimed at shaping professional competences (ability to perform certain actions and operations required in professional activities) or general competences (general competences are necessary for successful activities in both professional and extra- professional spheres).

The content of laboratory classes includes work with anatomical preparations, drawing up tables and diagrams, solving situational tasks, work in anatomical museum), current knowledge control. In the course of laboratory classes students form practical skills of working with anatomical preparations.

Forms of students' organisation at laboratory classes: frontal, group and individual. The specific form is chosen by the teacher at his discretion.

In the frontal form, all students perform the same work at the same time.

In the group form, the same work is carried out by teams of 2 to 5 students.

In an individual class each student performs an individual task.

To prepare for the laboratory class, the student should study the theoretical material on the topic, memorise the basic definitions and rules, and understand the data in the lectures. In order to consolidate the material studied the student should work with anatomical specimens in their spare time at the department and in the anatomical museum. Any difficulties in the laboratory work may be addressed to the instructor during the allotted consultation time.

Stages of preparation for the laboratory lesson:

- studying the theoretical material obtained during the lecture and self-study;
- work with natural anatomical specimens;
- self-checking of control questions on the topic.

Forms of independent extracurricular activities of students in anatomy include:

1. Preparation and production of anatomical preparations, models, plates, charts and graphs.
2. Self-study of students on training topics and issues included in the list of topics for independent study.
3. Preparation of anatomical preparations by students in their free time for laboratory studies and at the anatomical museum.
4. Familiarize students with additional training literature and other training aids on anatomy (eAtlases, training videos, etc.)
5. Participation in preparation of presentations, interactive training programs on anatomy, computer simulation of organs.

The department has organized dry and wet anatomical preparations up to 19 hours for students to work independently, and has an academic anatomy museum. In addition, students can use Internet resources, electronic medical library, with questions for self-monitoring students can find on the website of the department.

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

Practical classes are not included into the curriculum

### **11.2. Methodological instructive regulations for preparing for an examination**

The aim of the examination is to evaluate the work of a student in a particular course: the theoretical knowledge acquired, its strength, development of logical and creative thinking, acquisition of independent work skills, ability to analyse and synthesise the acquired knowledge and apply in practice the solution of practical problems.

The examination is conducted orally according to the tickets approved by the head of department. Examination ticket includes four questions, two of them - on organs, vessels and nerves of the head and neck. The wording of the questions coincides with the wording of the list of questions communicated to students one month before the examination session. Pre-exam consultation is organised for all study groups in preparation for the exam. The result of the examination shall be expressed as "excellent", "good" or "satisfactory".

The examiner may ask a maximum of one or two additional questions that do not exceed the requirements of the syllabus in order to clarify the grade. An additional question is understood as a question that is not related to the topic of the ticket. An additional question, as well as the main questions of the ticket, requires a detailed answer. In addition, the teacher may ask a number of clarifying and leading questions related to the topics of the main questions of the ticket. The number of clarifying and leading questions is unlimited. When scoring the answer to each question, several criteria are taken into account: 1) theoretical knowledge of the material, understanding of the relationship between structure and functions; 2) knowledge of anatomical preparations; 3) knowledge of Latin anatomical terminology.

### **11.3. Methodological instructive regulations for preparing for a test**

Preparing students for the examination includes

- reviewing the syllabus of the course;
- Identifying the sources (textbooks, additional literature, etc.) necessary for preparation and studying them;
- Use of lecture notes, materials of practical classes;
- Preparation of anatomical preparations;
- Consultations with the teacher.

Preparation for the credit begins with the first class of the discipline, in which students receive the teacher's general instruction and a list of basic requirements for current

and final reporting. At the same time, it is important to study the material systematically from the very beginning, guided primarily by the list of questions for the test (exam), to take notes on sources important for solving academic tasks. During the semester, students supplement, systematise and correct their work, learn new material and consolidate the material they have already studied.

#### **11.4. Methodological instructive regulations for performing computational and graphical**

#### **11.5. Methodological instructive regulations for performing a control work**

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

### 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 №	