


MINISTRY OF HEALTH OF THE REPUBLIC OF BELARUS
EDUCATIONAL INSTITUTION
BELARUSIAN STATE MEDICAL UNIVERSITY

Контрольный
экземпляр

APPROVED
by First Vice-Rector, Professor
I.N.Moroz
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Reg. # UD-0911-03-03 /edu.



HUMAN ANATOMY

**Curriculum of educational institution
in the educational discipline for the specialty:**

7-07-0911-03 «Dentistry»

Curriculum is based on the educational program «Human Anatomy» in the specialty 1-79 01 07 «Dentistry», approved 01.07.2022, registration # УД-Л.665/2223/уч; on the educational plan in the specialty 1-79 01 07 «Dentistry», approved 18.05.2022, registration # L 79-1-7/2223/mf.

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RECOMMENDED FOR APPROVAL:

by the Department of Human Morphology of the educational institution «Belarusian State Medical University»
(protocol # 10 of 15.05.2023);

by the Scientific and Methodological Council of the educational institution «Belarusian State Medical University»
(protocol # 6 of 27.06.2023)

EXPLANATORY NOTE

«Human Anatomy» is an academic discipline of the Morphological Module containing systematized scientific knowledge about the structure of organs and systems of the human body in connection with their functions.

The aim of the discipline «Human Anatomy» is the formation of basic professional competencies for the use of knowledge about the laws of development and structure of the human body, its systems and organs, taking into account age, gender and individual characteristics, solving problems of interpersonal and professional interaction, solving problems of professional activity, mastering clinical thinking, building clinical and pathoanatomic diagnoses.

The objectives of the discipline «Human Anatomy» are to form students' scientific knowledge about the structure of the human body, its systems and organs, the laws of development, some anomalies and malformations. The specifics of the training of doctors in the specialty 7-07-0911-03 «Dentistry» determines the need for a purposeful study of the detailed structure, development, age characteristics and interaction of the organs of the dental system with other anatomical formations of the head and neck. When studying the anatomy of the trunk and limbs, it is proposed to limit ourselves to discussing the general plan of the structure, classification of anatomical formations located here and highlighting those macroscopic features that allow the implementation of functions specific to these organs.

The knowledge and skills acquired during the study of the academic discipline «Human Anatomy» are necessary for the successful study of the academic disciplines «Histology, Cytology, Embryology», «Topographic Anatomy and Operative Surgery».

Studying the educational discipline «Human Anatomy» should ensure the formation of the following students' basic professional competence:

BPC. While providing medical care, use knowledge about the patterns of the human body development and anatomical structure, its systems and organs, taking into account age, gender and individual characteristics.

As a result of studying the academic discipline «Human Anatomy», the student should

know:

anatomy, topography and functions of organs and systems of the human body;
 detailed structure, development, age features and interaction of the organs of the maxillary system with other anatomical formations of the head and neck;
 projection of organs on the surface of the body;
 general patterns of organogenesis;
 fundamentals of variant anatomy and possible malformations of organs;
 the importance of fundamental research for medicine;

be able to:

recognize anatomical objects on visual aids, anatomical preparations and images obtained using radiation diagnostics methods;

evaluate the structural and functional relationships of organs, systems and parts of the human body to understand the essence of physiological and pathological processes in the body;

use educational and scientific literature on the academic discipline;

master:

anatomical terminology;

methods of macroscopic studies of biological objects;

basic information transformation technologies.

Total number of hours for the study of the discipline is 300 academic hours. Classroom hours according to the types of studies: lectures - 15 hours, laboratory classes - 144, student independent work (self-study) -141 hours.

Intermediate assessment is carried out in accordance with the curriculum in the specialty in the form of a credit (1st, 2nd semesters) and an exam (3rd semester).

Form of higher education – full-time.

**ALLOCATION OF ACADEMIC TIME
ACCORDING TO SEMESTERS OF STUDY**

Code, name of the specialty	Semester	Number of academic hours					Form of intermediate assessment
		total	in-class	including		out-of-class self-studies	
				lectures	laboratory studies		
7-07-0911-03 «Dentistry»	1	90	43	7	36	47	credit
	2	120	80	8	72	40	credit
	3	90	36	-	36	54	exam
Total hours		300	159	15	144	141	

THEMATIC PLAN

Section (topic) name	Number of class hours	
	lectures	laboratory
1. Anatomy as a science. Bones; skeletal system	3	20
1.1. Anatomy as an academic discipline. The axial skeleton. Vertebral column. Thorax skeleton.	1	4
1.2. Skull. Neurocranium	-	4
1.3. Bones of the facial skull	1	4
1.4. Skull as a whole. Frontal, lateral, posterior, superior aspects. Age anatomy of the skull	1	4
1.5. The appendicular skeleton. Skeleton of upper and lower limbs	-	4
2. Joints; the system of joints	1	4
2.1. Classification of bone connection. Connection of cranium bones. Connection of bones of the trunk	1	2
2.2. Connection of bones of the upper and lower limbs	-	2
3. Muscle; muscular system	3	12
3.1. General characteristics of muscles. Neck muscles. Neck fascia.	1	4
3.2. Muscles and fascia of the head	1	4
3.3. Functional anatomy of trunk and extremity muscles	1	4
4. Cardiovascular system	2	12
4.1. Cardiovascular system. Circulation. Heart. Pericardium. Aorta	-	4
4.2. Arteries of the head, neck and upper extremity	1	4
4.3. Veins of systemic circulation. Lymphatic vessels, trunks and ducts	1	4
5. Lymphoid system. Regional lymphatic nodes of head and neck	-	2
6. Endocrine glands. Morphofunctional characteristics of the pituitary gland, pineal gland, thyroid gland, parathyroid glands, adrenal gland	-	2
7. Nervous system	2	24
7.1. General plan of the structure of the nervous system. Spinal cord	-	4

Section (topic) name	Number of class hours	
	lectures	laboratory
7.2. Brain. Nerve pathways of brain and spinal cord	-	4
7.3. Meninges. Peripheral nervous system. Spinal nerves. Cervical plexus	-	4
7.4. Cranial nerves	1	8
7.5. Autonomic part of the peripheral nervous system	1	4
8. Sense organs	-	8
8.1. Structural and functional characteristics of the organ of hearing and balance	-	4
8.2. Eye and related structures	-	4
9. Digestive system	2	12
9.1. General characteristics of the digestive system. The structure of the organs of the oral cavity and major salivary glands	1	4
9.2. Pharynx, esophagus, stomach, small and large intestine	1	4
9.3. Liver. Pancreas. Peritoneum	-	4
10. Respiratory system	1	4
10.1. General characteristics. The macroscopic structure of the nose, larynx, trachea	1	2
10.2. Lungs. Chest cavity	-	2
11. Urinary system. Reproductive systems	1	8
11.1. The structure of the urinary system	-	2
11.2. Functional morphology of male reproductive organs	1	2
11.3. Functional morphology of female reproductive organs	-	4
12. Anatomy of the head and neck	-	36
12.1. Development, structure, blood supply and innervation of anatomical formations of the neck. Neck muscles	-	6
12.2. Vessels and nerves of the neck	-	6
12.3. Neck organs	-	3
12.4. Development, structure, blood supply and innervation of anatomical formations of the head	-	3
12.5. The eye and its associated structures. Nose area. Topography of the paranasal sinuses	-	3

Section (topic) name	Number of class hours	
	lectures	laboratory
12.6. Cranial part of the head	-	3
12.7. Anatomy of oral cavity	-	6
12.8. Anatomy of teeth		6
Total hours	15	144

CONTENT OF THE EDUCATIONAL MATERIAL

1. Anatomy as a science. Bones; skeletal system

1.1. Anatomy as an academic discipline. The axial skeleton. Vertebral column. Thorax skeleton

Methods of anatomical studies. International Anatomical Terminology. Planes, lines and areas of the human body. Organs, associations in organ systems. Communication with other anatomical biomedical and clinical disciplines. The main historical stages of anatomy as a science.

Classification of bones. Bone as an organ.

Spinal column. Sections, quantity of vertebrae, the primary and secondary curves (kyphosis, lordosis), the spinal canal. The structure of vertebrae of different parts. Structural features of cervical vertebrae.

Ribs (I-XII). True, false and fluctuating ribs. Features of structure of the first rib. Sternum. Thorax. Variants and anomalies of development of the skeleton trunk.

1.2. Skull. Neurocranium

Occipital, frontal, sphenoid, temporal, parietal, ethmoid bones. Parts, the relief of surfaces, foramina, channels.

Paranasal sinuses: frontal, sphenoid, ethmoid labyrinth.

1.3. Bones of the facial skull

Parts of maxilla, shape and topography of the upper surfaces of maxilla, the frontal, zygomatic, palatine, and alveolar processes. Infraorbital fissure, channel and foramina. Alveolar foramina and canals. Sinuses of maxilla. Alveolar process: alveolar arch, dental alveoli: its position, shape, alveolar and interradicular septa. Alveolar eminence. Incisive channels and foramina. Age and individual features of maxilla structure.

Mandible. Parts (body and ramus), surface relief. Coronoid and condylar processes, the shape of mandible caput. Mandibular canal: holes, individual characteristics of position in relation to dental roots. Alveolar part: alveolar arch, position, the shape of dental alveolus, and interradicular and alveolar septa. Juga Alveolaria. Metric characteristics of mandible. Age and individual features of mandible structure. Trajectory and buttresses.

Palatine bone, nasal bone, inferior nasal concha, vomer, lacrimal bone, zygomatic bone. Parts, the relief of surfaces, holes, canals.

Hyoid bone: parts, position.

1.4. Skull as a whole. Frontal, lateral, posterior, superior aspects. Age anatomy of the skull

Cranium. Calvarium. External and internal base of cranium: anterior, medial and posterior cranial fossa; the topography of holes and canals. Zygomatic arch. Temporal, infratemporal and pterygopalatine fossa. Metric parameters of cranium. Cranial index. Cranial shape: dolichocephalous, mezocephalous, brachycephalous. Radiological anatomy of cranium. Craniometric indices.

Facial cranium. Eye socket. Nasal osseous cavity. Metric parameters of facial cranium.

Embryogenesis of cranium: origins and the main stages of morphogenesis. Variants and anomalies. Neonatal cranium. The developmental anatomy of facial cranium.

1.5. The appendicular skeleton. Skeleton of upper and lower limbs

Bones of the upper extremity. Bones of pectoral girdle: scapula, clavicle. Bones of free parts of the upper extremity: humerus, bones of forearm, bones of the wrist, general morphological and functional characteristics.

Bones of the lower extremity. Pelvic girdle: pelvic bone. Bones of free part of the lower extremity: femur, patella, bones of tibia, bones of foot, general morphological and functional characteristics.

2. Joints; the system of joints

2.1. Classification of bone connection. Connection of cranium bones. Connection of bones of the trunk

Morphofunctional characteristics of continuous (synarthrosis) and discontinuous (joint) joints. Classification of joints. Types of movements in joints and their elementary analysis.

Fibrous (sutures, dental alveolar syndesmosis) and cartilaginous joints of the skull.

Temporomandibular joint: characteristics of articular surfaces, articular disc, articular capsule, ligaments. Axes of movement. Atlas occipital joint. Syndesmosis of the vertebral column. The structure of the intervertebral disc. Vertebral column joints: median and lateral atlantoaxial joints. Zygapophyseal joints.

Thoracic joints: costovertebral and sternocostal joints.

2.2. Connection of bones of the upper and lower limbs

Comparative structural and functional characteristics of homologous joints of the upper and lower extremities. X-ray anatomy of the joints of the extremities.

3. Muscle; muscular system

3.1. General characteristics of muscles. Neck muscles. Neck fascia

Classification of muscles by shape, structure, origin, function. Muscle groups. Auxiliary apparatus of muscles: aponeurosis and fascia, synovial vaginas, synovial bags. The basic principles of muscle action.

Classification of neck muscles, division into groups; places of origin and attachment; interposition; functions. Fascia of neck: division into plates.

3.2. Muscles and fascia of the head

Classification, general principles of structural and functional organization. Facial muscles. The place of beginning and attachment, the direction of fibers; functions.

Masticatory muscles: the place of beginning and attachment, the direction of fibers, functions. Fascia of the head.

3.3. Functional anatomy of trunk and extremity muscles

Trunk muscles and fascia. Back muscles. Chest muscles. Diaphragm. Abdominal muscles. Functional anatomy of trunk muscles.

Muscles of the upper and lower extremities. Classification into functional groups: flexor and extensor, abductor and adductor, pronator and supinator, and its location in regard to the joints, in which movements are performed.

4. Cardiovascular system

4.1. Cardiovascular system. Circulation. Heart. Pericardium. Aorta

Embryogenesis of cardiovascular system. Fetal circulation. Congenital anomalies of development of heart and major blood vessels. The structural components of the system and lesser circulation. Morphological and functional characteristics of the main types of blood vessels.

Heart: shape, position, the projection on the front wall of the chest. Chambers of the heart: atria and ventricles. Heart valves. The structure of the wall of the heart: endocardium, myocardium and epicardium. The conduction system of the heart: nodes, bundle of His. Pericardium: fibrous, serous. Pericardial cavity.

Aorta: parts, skeletotopy. Ascending aorta: coronary arteries. Aortic arch: the name of branches, the sequence of origin. Common carotid artery: the location of origin, the projection on the skin of neck, the branches (common carotid artery bifurcation). External carotid artery: the general plan of structure, three groups of branches. Internal carotid artery: cervical, petrosal, cavernous and brain parts, branches. Subclavian artery: the general plan of structure, with three departments, branches. Thoracic aorta. Bronchial, esophageal pericardial, mediastinal branches, posterior intercostal, upper diaphragmatic arteries, areas of branches. Abdominal aorta. Parietal and visceral branches, areas of blood supply. Bifurcation of aorta: topography, terminal branches. Great vessels of the upper and lower extremities.

4.2. Arteries of the head, neck and upper extremity

Common carotid artery: the place of origin, projection on the skin of the neck. Sleepy glomus. Carotid sinus. Bifurcation of the common carotid artery. External carotid artery: three groups of branches.

Internal carotid artery: cervical, petrous, cavernous and cerebral parts, branches.

Subclavian artery: divisions, branches.

4.3. Veins of systemic circulation. Lymphatic vessels, trunks and ducts

Cardiac veins, coronary sinus. The right and left pulmonary veins

Superior vena cava tributaries. of the superior vena cava: brachiocephalic vein, internal jugular vein. Topography, tributaries. Dural sinuses. Cerebral veins, veins of orbit. Azygos vein: location, tributaries.

Inferior vena cava: topography, tributaries. Veins of the lower extremities: its classification into superficial and deep; anastomoses.

Portal vein tributaries. Tributaries, anastomoses between the tributaries of vena cava superior et inferior, and portal vein of the liver.

Lymphatic vessels. Lymphatic trunks: jugular, subclavian, broncho-mediastinum, lumbar, intestinal. Origins of formation, topography. Thoracic and the right lymphatic ducts. Origins of formation, thoracic duct chylocyst, confluences into the venous system.

5. Lymphoid system. Regional lymphatic nodes of head and neck

Lymph node (capsule, trabeculae, hiatus, cortical and medullary substances). Single and group lymphoid nodules of mucous membranes of digestive and respiratory systems. Tonsils.

Lymph nodes of the head and neck. Topography of occipital, mastoid, superficial and deep parotid, facial, submandibular, submandibular nodes. Anterior and lateral cervical lymph nodes.

6. Endocrine glands. Morphofunctional characteristics of the pituitary gland, pineal gland, thyroid gland, parathyroid glands, adrenal gland

Classification of endocrine glands. Pituitary: topography, division into adenohypophysis and neurohypophysis. Pineal gland, topography, functions.

Thyroid: topography, lobes, isthmus. Anatomical and surgical capsule of the gland. Thyroid hormones. Topography of parathyroid glands. The role of parathyroid hormone in mineral metabolism control.

Adrenal: topography, the cortex and medulla, hormones.

7. Nervous system

7.1. General plan of the structure of the nervous system. Spinal cord

The development of the nervous system. Classification into the central and peripheral parts. The function of the nervous system. Neurons. The reflex arch.

Spinal cord: skeletotopy, external structure, division into segments. Radices, sensitive ganglions of spinal nerves, the trunk of cerebral nerve. The internal structure of the spinal cord. The topography of nuclei and pathways.

7.2. Brain. Nerve pathways of brain and spinal cord

Parts (rhombencephalon, mesencephalon, prosencephalon). Brainstem. The external and internal structure of medulla oblongata and pons. The fourth ventricle. Rhomboid fossa. Cerebellum: corpus (division into lobes); internal structure: cerebellar cortex and nuclei, cerebellar peduncles. Mesencephalon: the external and internal structure. Cerebral aqueduct.

Prosencephalon: the division into parts. The external and internal structure of thalamus, hypothalamus, epithalamus and metathalamus. The third ventricle. Telencephalon: cerebral hemisphere: surfaces, lobes, fissures, gyri. Structural components of hemispheres: corpus callosum, fornix, lateral ventricle, cerebral cortex, hippocampus. The localization of functions in the cerebral cortex of

hemispheres. The basal part of telencephalon. Basal nuclei and associated with it structures.

The general principle of structure of sensitive (afferent) pathways. Types of sensitivity: exteroceptive, proprioceptive and interoceptive. The localization of sensory nerve cells and interneurons. Somatotopic representation of sensitive centers in the cerebral cortex of hemispheres. General principles of structural organization of ascending (afferent) projection pathways of common and proprioceptive sensitivity. The lateral and anterior spinothalamic path; pathways of proprioceptive sensitivity of cortical areas (thin and wedge-shaped fascicle, medial lemniscus), anterior and posterior spinocerebellar path. Pathways of common and proprioceptive sensitivity of head and neck: the location of neurons and topography of pathways in brain slides (specimen). Neuroanatomical basis of appreciation of pain. Morphological and functional characteristics of descending (efferent) projection pathways.

7.3. Meninges. Peripheral nervous system. Spinal nerves. Cervical plexus

Cranial dura mater: the structural features of wall processes. The formation of sinuses. Arachnoid mater of brain: arachnoid granulation, subarachnoid cisterns. subarachnoid space. Pia mater: choroid plexus of ventricles. Cranial dura mater, arachnoid mater and pia mater of spinal cord. Production, circulation and outflow flow pathways of cerebral spinal fluid.

Spinal nerve. Anterior and posterior radices, sensitive nodes, trunk of spinal nerve.

Cervical nerves [C1-C8]: anterior and posterior branches, areas of its distribution. Cervical plexus: origins of its formation, branches. Brachial plexus. Pectoral nerves. Lumbar and sacral plexus. Patterns of innervation of the musculoskeletal system: bones, joints and muscles. The communication of the spine nerve with the autonomous nervous system.

7.4. Cranial nerves

General morphological and functional characteristics and classification of the cranial nerves.

Terminal nerve (0). Olfactory nerve (I): formation, fibrous structure.

Optic nerve (II): the course of nerve in the orbit and cranium, optic chiasma.

Oculomotor (III), trochlear (IV) and abducent (VI) nerves: nucleus, exit points of nerves from the brain and cranium, general structure plan.

Trigeminal nerve (V): nuclei; sensitive radices and trigeminal ganglion, motor radices, exit points of the brain and cranium. The general plan of trigeminal nerve: ophthalmic, maxillary and mandibular nerves.

Facial nerve (VII): places of nerve outlet on the basal brain surface. Pathway of facial nerve canal along and after the outlet from the stylomastoid foramen. Parotid plexus: branches. Intermediate nerve: geniculate ganglion, greater petrosal nerve, chorda tympani.

Vestibulocochlear nerve (VIII): topography of the nuclei. Vestibular and cochlear nerves, vestibular node, cochlear node.

Glossopharyngeal nerve (IX): nuclei, place of outlet of nerve from the brain and cranium, the upper and lower ganglions, branches.

Nervus vagus (X): nuclei, place of outlet of nerve from the brain and cranium, the upper and lower ganglions, general structure plan.

Accessory nerve (XI): the place of outlet of nerve from the brain and cranium, branches.

Hypoglossal nerve (XII): localization of nucleus, the place of outlet of nerve from the brain and cranium, general structure plan.

7.5. Autonomic part of the peripheral nervous system

General principles of structure and function; morphological and functional differences from the animal nervous system. Classification into the sympathetic and parasympathetic parts. The concept of local, segmental and higher suprasegmental centers.

The sympathetic part. Sympathetic trunk. Cervical nodes: names and location of ganglions, branches. The structural elements of the peripheral part.

Parasympathetic part. Its division into the cranial and pelvic regions. Parasympathetic components of cranial nerves. Ciliary ganglion: localization, branches. The innervation of ciliary muscle and pupil sphincter. Pterygopalatine, submandibular, sublingual, otic ganglions: positions, radices. Morphological substance of pupil, conjunctival, corneal and accommodative reflexes

Plexus and autonomous ganglions. Neck-head part: common carotid plexus, cavernous plexus, external carotid plexus, subclavian plexus, vertebral plexus.

8. Sense organs

8.1. Structural and functional characteristics of the organ of hearing and balance

External ear: the structure of external ear, external auditory canal and tympanic membrane. Middle ear: walls of tympanum and its contents. Auditory ossicles. Auditory tube. Inner ear: bone, membranous, and vestibular-cochlear labyrinth. The mechanism of sound perception. Morphological and functional characteristics of the organ of equilibrium. Auditory tract.

8.2. Eye and related structures

Eyeball: tunica fibrosa oculi, choroid and retina. Optic nerve. Central artery and vein of retina. Lens. Ocular anterior and posterior chambers. Supporting structures of the eye (external muscles of the eyeball, eyebrows, eyelids, conjunctiva, lacrimal apparatus). Visual tract.

9. Digestive system

9.1. General characteristics of the digestive system. The structure of the organs of the oral cavity and major salivary glands

General data on the embryonic development of intestinal tube. Digestive glands: classification, sources of development in embryogenesis. Mouth. Vestibule of mouth: structure of the upper, lower lip and cheeks. Fat body of cheek. Topography of papillae parotid duct. Oral cavity. Palate: hard and soft palate. Hard palate: the relief of mucous membranes. The structure of the soft palate. Pharynx: palate-glossal and palate-pharyngeal arches, tonsillar fossa and palatine tonsil. The muscles of soft

palate and pharynx: structure, function. The bottom of mouth: frenulum of tongue, sublingual fold, sublingual papilla.

The principles of structural organization of major salivary glands. General morphological and functional characteristics of teeth. Tongue: parts, surface, sulcus, papillaries. Lingual tonsil. Muscles of tongue. Blood supply, innervation and lymph drainage from the mucosa and tongue muscles. Structural and functional characteristics of organ of taste. Pathway of taste organ.

9.2. Pharynx, esophagus, stomach, small and large intestine

Pharynx. Functions, topography. Pharyngeal cavity, its division into parts. The structure of pharynx. Pharyngeal lymphoid ring.

Esophagus. Topography, parts, its wall structure, broncho-aortic and diaphragmatic narrowing of esophagus.

Stomach, small and large intestine. The projection of the stomach, small intestine and colon to the anterior abdominal wall. Macroscopic structure. The visual differences of structure of colon and small intestine.

9.3. Liver. Pancreas. Peritoneum

Liver. The projection to the body surface. The structure of liver and gallbladder. Common hepatic, cystic and common bile ducts. The vessels and nerves of the liver. Liver function.

Pancreas: its location in the abdomen, parts: the caput, cervix, corpus and tail. The islets of pancreas. Pancreatic duct. Vessels and nerves of pancreas.

Parietal and visceral peritoneum, peritoneal cavity. Parts of peritoneum: greater and lesser omentum, the mesentery of small intestine and colon, excavations, plica and fosses, its location.

10. Respiratory system

10.1. General characteristics. The macroscopic structure of the nose, larynx, trachea

Division into the respiratory tract and respiratory department. The development of the respiratory system. Nose: borders, parts, cartilages of nose. Nasal cavity: vestibule of nose, respiratory and olfactory regions. Nasal septum. Nasal turbinates and nasal passages, and its communication with the paranasal sinuses and orbital cavity. Structural and functional characteristics of organ of smell. Olfactory pathway.

Larynx: functions, topography. Cartilages and articulations of the larynx. Laryngeal cavity. The mechanism of voice formation. Laryngeal blood supply, innervation, lymph outflow.

Trachea: topography, cervical and thoracic parts. The structure of the wall of trachea. The right and left main bronchi, lobar and segmental bronchi.

10.2. Lungs. Chest cavity

Shape, surface, edge, lobes. The radices and hiatus of the lung. Bronchopulmonary segments, bronchioles, lobules. Blood supplying, innervation, lymphatic drainage.

The cavity of my chest. Visceral and parietal pleura. Pleural sinuses its localization and functions. The pleural cavity. Mediastinum: its division into parts, the boundaries between it. Organs of the upper and lower mediastinum.

11. Urinary system. Reproductive system

11.1. The structure of the urinary system

General morphological and functional characteristics of the urinary system. Features, topography, external and internal structure of the kidney. The structure of nephron. Renal pelvis: large and small calices. Vessels and nerves of the kidney.

Ureters, the bladder, the female and male urethra: the structure, function, its position in relation to the peritoneum and other organs of the pelvis.

11.2. Functional morphology of male reproductive organs

Division into the internal and external genital organs, its position in the pelvis, functions, sources of blood supply.

11.3. Functional morphology of female reproductive organs

Division into the external and internal genital organs, its position in the pelvis. Structure and functions of the ovary. Uterus: functions, the structure of the wall. Vagina. Vulva. Sources of blood supply.

Retroperitoneal space. Pelvic cavity. Perineum.

12. Anatomy of the head and neck

12.1. Development, structure, blood supply and innervation of anatomical formations of the neck. Neck muscles

Muscle development. Neck muscles: superficial, deep, and suprahyoid and infrahyoid, its innervation and blood supplying, its attitude to the fascia of the neck. Neck fascia. Cellular spaces of the neck.

12.2. Vessels and nerves of the neck

The branches of the external carotid artery: superior thyroid, lingual, occipital, auricular posterior and ascending pharyngeal arteries, blood supplying areas and anastomoses, individual types of arterial passages. Subclavian artery: branches. Vertebral and internal thoracic artery, thyrocervical and costocervical trunk: course, areas of blood supplying, anastomoses. Internal jugular vein: inflows, anastomoses between the intracranial and extracranial venous vessels. Origins of external and anterior jugular vein forming.

Anterior branches of cervical nerves [C1-C4], the formation of cervical plexus. The upper and lower radices of cervical ansa, the qualitative composition of fibers. The innervation of the skin of the neck. Phrenic nerve: areas of innervation, the qualitative composition of fibers, individual variants of occurrence. Accessorius (XI) and hypoglossal (XII) nerves, areas of innervation; the qualitative composition of fibers. Nerve vagus (X): ganglions, branches; areas of innervation of the neck, the qualitative composition of fibers (somatic and autonomic components). Glossopharyngeal (IX) nerve: ganglions, areas of innervation; the qualitative composition of fibers (somatic and autonomic components.) General, internal and external carotid plexus: the origins of qualitative composition of fibers of the neck innervation.

12.3. Neck organs

Sublingual and submandibular glands: the sources of blood supplying, the innervation and neural regulation of secretion. Topography of excretory ducts.

Pharynx, the cervical part of esophagus, larynx, the cervical part of trachea, thyroid and parathyroid glands: the sources of blood supplying and innervation, the path of lymphatic drainage.

12.4. Development, structure, blood supply and innervation of anatomical formations of the head

Development of the maxillofacial region, sources; derivatives of the pharyngeal arches; formation of the primary oral and nasal cavities; morphogenesis of the maxillary processes: formation of the upper lip, secondary nasal septum. Embryogenesis of the tongue, thyroid and parathyroid glands. Formation of the secondary palate. External changes of the oral-facial complex during embryonic development. Congenital malformations: macrostomia and microstomia, cleft upper lip, hard palate, congenital neck cysts.

Facial muscles: groups, origins of embryogenesis, blood supplying, innervation, the main functional disorders occurring due to the lack of innervation of individual muscle groups.

Masticatory muscles: development origins in embryogenesis, blood supplying and innervation. The role of masticatory muscles in the formation of dislocation head of mandible in the temporo-mandibular joint.

Facial artery: individual variants of orifices and artery passages, branches, areas of blood supplying, intra-and inter-systemic anastomoses. Maxillary artery: location in association with the condylar process of mandible, the passage of infratemporal and pterygo-palatine fossa, branches of the blood supplying, intra-and inter-systemic anastomoses. Internal carotid artery: branches, areas of blood supplying, anastomoses. The source of blood supplying of the brain, individual variants of the arterial circle of the brain.

Facial vein: suppliers; anastomosis as potential routes of infection. Pterygoid plexus.

The qualitative composition of nerve fibers in oculomotor (III), abducent (VI) and trochlear (IV) nerves (somatic and autonomic components), areas of innervation. External manifestations of damage of cranial nerves III, IV and VI.

The branch of trigeminal (V) nerve: the area of innervation, the qualitative composition of fibers (somatic and autonomic components). Types of skin sensitivity impairments, depending on the level of impairment.

Facial (VII) nerve: passage; innervation area, the qualitative composition of nerve fibers (somatic and autonomic components).

12.5. The eye and its associated structures. Nose area. Topography of the paranasal sinuses

Bone walls of the orbit: supraorbital and infraorbital margins; canals, foramina, fissures, groves; fossa and their contents. Characteristics of the muscles of the eyeball, sources of innervation. Ophthalmic artery, superior and inferior ophthalmic veins. Ciliary ganglion, topography, branches, area of innervation. Eyeball:

characteristics of the tunica of the eyeball and the inner core of the eye. The vagina of the eyeball. The adipose body of the orbit, connections with cellular spaces of the face. The layered structure of the eyelid. Lacrimal gland, tear outflow pathways.

The nose area. External nose, layered structure, innervation of the nasal skin. Nasal cavity: bone walls, nasal concha and nasal meatuses. Communication of the nasal cavity with the paranasal sinuses and the orbit. Blood supply and innervation of the nasal mucosa. Tomography of the paranasal sinuses, blood supply and innervation of the mucous membrane. The ratio of the roots of the upper molars to the maxillary sinus.

12.6. Cranial part of the head

The border of the calvaria and base and skull. The bones of the cerebral skull. The external base of the skull; openings and canals and their contents. Cranial fossae: borders, openings, canals and their contents. Temporary synchondrosis of the skull. Calvarium; features of development and bone structure. Sutures of the skull. Skull shapes: variants and anomalies.

12.7 Anatomy of the oral cavity

Boundaries and the organs of the oral cavity. The blood supplying, innervation, lymph drainage from the mucosa of vestibule of the oral cavity. Muscles of the soft palate: the blood supplying and innervation, the main clinical manifestations of nerve disorders of the muscles of soft palate. Muscles of the tongue: the blood supplying and innervation, lymph drainage. The blood supplying and innervation, lymph drainage from the oral floor mucosa and muscles.

12.8. Anatomy of teeth

The walls and organs of the mouth. Blood supplying, innervation and lymphatic drainage from the mucosa of the vestibule of mouth. The muscles of soft palate: blood supplying and innervation, the main clinical manifestations of its innervation impairments. Muscles of the tongue: the blood supplying and innervation, lymph drainage. The relief of the oral floor mucosa. Diaphragm of the mouth.

Permanent teeth. Dental formula: complete, group, alphanumeric, FDI. Parts of tooth: root, cervix, crown (clinical, anatomical). The cavity of the crown, the root canal of the tooth. Surface of crown of tooth: occlusion, vestibular (buccal and labial), lingual, palatal, interproximal (distal and mesial). The concept of contact zone. The division of teeth in the thirds. Signs of teeth: the angle, curvature of crown and the signs of root of tooth. The relief of surfaces of crowns of permanent teeth: cusp of tooth, tubercle, gable, cingulum, occlusal embrasure, occlusal fossa. Morphological characteristics of tooth groups: the quantity, shape and size of roots, the shape and dimensions of the cavities of crowns and root canals, the relief of crown's surfaces. Dental roots, nasal cavity, maxillary sinus and mandibular canal ratio. Differences between primary and permanent teeth.

Dental formula: complete, group, alphanumeric, FDI. Eruption of primary teeth. The main stages of the process: the calcification of crowns and the beginning of morphogenesis of dental root, the appearance of crown in the mouth and the ending of root morphogenesis. Terms of eruption and the replacement of primary teeth.

Participation of dento-facial system in chewing, swallowing, speech articulation. Neuromuscular control of chewing. Radiological anatomy of teeth. Sources of blood supplying and innervation of teeth, the path of lymph drainage, regional lymph nodes.

ACADEMIC DISCIPLINE CURRICULAR CHART

Section, topic #	Section (topic) name	number of hours		Self- studies	Forms of control
		lectur es	laboratory classes		
1 semester					
1.	Anatomy as a science. Bones, skeletal system	7	36	47	
1.1.	Anatomy as an academic discipline. The axial skeleton. Vertebral column. Thorax skeleton. 1. Methods of studying the structure of the human body. 2. Anatomical terminology. 3. Planes and axes are used to describe the position of organs and parts of the human body in space. 4. Classification of bones. 5. Axial skeleton. The vertebral column: departments, functions. Formation of spinal curves. 6. The general plan of the structure of the vertebra. 7. The structure of the cervical vertebrae. Features of the structure of the first, second and seventh cervical vertebrae 8. The structure of the thoracic, lumbar and sacral vertebrae. 9. Sternum: position, structure. 10. Classification of ribs. The structure of the rib. Features of the structure of the first rib. 11. The skeleton of the chest. The boundaries of the upper and lower apertures, the costal arc, the subcostal angle. Age and individual differences of the	3	20 4	26 4	Oral enquiry, test control, practical skills

	<p>chest</p> <p>12. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; visualization of anatomical formations on images obtained using methods of radiological examinations; palpation of bone surface landmarks of the human body.</p>			
	<p>General osteology and arthrodesmology</p> <ol style="list-style-type: none"> 1. General characteristics of the skeleton. 2. Classification of bones. 3. The development of the skeleton in embryogenesis. 4. Types of bone connections 	1	-	Electronic test.
1.2.	<p>Skull. Neurocranium</p> <ol style="list-style-type: none"> 1. Skull: division into cerebral and facial divisions, name and location of bones. 2. The structure of the occipital bone: parts, relief of the outer and inner surfaces. Canals, openings and sulcus of the occipital bone. 3. The structure of the parietal bone: edges, angles, relief of the outer and inner surfaces. 4. The structure of the frontal bone: parts, relief of the outer and inner surfaces, frontal sinus. 5. The structure of the ethmoid bone. Ethmoid labyrinth. 6. The structure of the sphenoid bone: parts, canals, foramina, sphenoid sinus. 7. The structure of the temporal bone: parts, its relative positions. Relief of the outer and inner surfaces. The tympanic cavity. The structure of the mastoid process. 	-	4	5 Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

	<p>8. Canals and canaliculi of the temporal bone: openings, direction of travel, bends, contents.</p> <p>9. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; palpation of bone surface landmarks of the human body.</p>			
1.3.	<p>Skull. Bones of the facial skull</p> <ol style="list-style-type: none"> 1. The structure of the maxillae: body, processes. The relief of their surfaces. 2. Maxillary sinus: localization, walls, communication with the nasal cavity. 3. Palatine bone: plates, processes, its relative positions. 4. The structure of the bone palate. 5. Mandible: the relative positions of parts, the relief of corpus and processes. Mandibular canal: holes, contents. 6. Small bones of the facial skeleton: zygomatic, lacrimal, nasal, inferior nasal concha, vomer: its location and structure. 7. Hyoid bone: location, structure. 8. Development of the bone palate, maxilla and mandible. 9. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; palpation of bone surface landmarks of the human body. 	-	4	5 Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
	<p>Ontogenesis of skull bones. Anatomy of the facial skeleton</p> <ol style="list-style-type: none"> 1. Development of the bones of the base and calvaria of the skull. 2. Embryogenesis of the facial skeleton. 3. Clinical anatomy of the facial skeleton. 4. Craniometry 	2	-	Electronic test.
1.4.	<p>Skull as a whole. Frontal, lateral, posterior, superior aspects. Age anatomy of the skull</p> <ol style="list-style-type: none"> 1. Orbit: structure of the walls. Foramina, fissures and canals of the orbit, communication with other cavities of the skull. 2. Bony nasal cavity: structure of the lateral, medial, superior and inferior walls. 3. Nasal meatuses: borders, communication with other cavities of the skull. 4. Fosses of the lateral aspect of the skull. Borders, the name of the bones that make up the bone base of the temporal and infratemporal fossa. Fissures and foramina, communication of fosses with other cavities of the skull. 	-	4	6 Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop.

	<p>5. Pterygopalatine fossa: walls, communication with other cavities of the skull.</p> <p>6. Internal (surface of) cranial base. Anterior, middle and posterior cranial fossa; foramina, canals, fissures.</p> <p>7. Grooves for the sinuses of the dura mater.</p> <p>8. External (surface of) cranial base; foramina, canals.</p> <p>9. Calvaria; features of the structure and development of bones. Sutures of the skull.</p> <p>10. Age anatomy of the facial and cranial skull.</p> <p>11. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; palpation of bone surface landmarks of the human body.</p>			practical skills.
1.5.	<p>The appendicular skeleton. Skeleton of upper and lower limbs</p> <p>1. The structure of the shoulder girdle.</p> <p>2. The skeleton of the free part of the upper limb: arm, forearm, hand.</p> <p>3. Pelvic girdle; structure of hip bone.</p> <p>4. The skeleton of the lower extremity free part: hip, leg, foot.</p> <p>5. Similarities and differences in the structure of the skeleton of the upper and lower extremities.</p> <p>6. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; palpation of bone surface landmarks of the human body.</p>	-	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
2.	Joints; the system of joints	1	4	7
	<p>Anatomy of the temporomandibular joint</p> <p>1. Introduction</p> <p>2. Morphofunctional characteristics</p> <p>3. Dysfunction of the joint</p>	1	-	Electronic test.
2.1.	<p>Classification of bone connection. Connection of cranium bones. Connection of bones of the trunk, upper and lower limbs</p> <p>1. Classification of bone junctions.</p> <p>2. Morphological and functional characteristics of continuous and discontinuous (synovial) junctions of bones. Joints of vertebral column: the structure of median and lateral atlanto-axial joints. Zygapophysial joints.</p>	-	4	7
				Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards.

	<ol style="list-style-type: none"> 3. Temporomandibular joint: morphological and functional characteristics 4. The structure of the median and lateral atlantoaxial joints. Atlanto Occipital joint: articular surfaces, ligaments, movements. 5. The joints of chest: the joint head of rib and costotransverse joint, structure, types of movements. 6. The names and general morphological and functional characteristic joints of the upper and lower extremities. 7. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; palpation of bone surface landmarks of the human body. 	3	12	Electronic workshop. Evaluation using virtual simulators, practical skills.
3.	<p>Muscles, muscular system</p> <p>Morphofunctional characteristics of the muscles of the head and neck</p> <ol style="list-style-type: none"> 1. Classification, structure of neck muscles. 2. Fascia and cellular spaces of the neck. 3. Classification of the muscles of the head. 4. Morphofunctional characteristics of masticatory muscles. 5. Morphofunctional characteristics of facial muscles. 	2	-	Electronic test.
3.1.	<p>General characteristics of muscles. Neck muscles. Neck fascia.</p> <ol style="list-style-type: none"> 1. Skeletal muscle: classification, function. The structure of muscle as an organ. 2. Auxiliary apparatus of muscle: fascia, synovial vagina and bags, bones and fibrous canals, sesamoid bone. 3. Classification of neck muscles by topography and genetic features. 4. Superficial muscles of the neck: origin and insertion, functions. 5. Suprahyoid muscles of the neck: origin and insertion, functions 6. Infrahyoid muscles of the neck: origin and insertion, functions 7. Deep muscles of the neck: origin and insertion, functions 8. Fascia of the neck. The structure of the cervical fascia and the topography of its plates. Cellular spaces of the neck 9. Neck topography, division into regions. The boundaries of the anterior, sternocleidomastoid and lateral regions of the neck. 10. Neck triangles. 11. Practical skills: visualization of anatomical formations on anatomical 	-	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

3.2.	<p>preparations and other visual aids.</p> <p>Muscles and fascia of the head. Classification. The structure of the masticatory muscles</p> <ol style="list-style-type: none"> 1. Classification of the muscles of the head. 2. Masticatory muscles: sources of development, general characteristics. 3. Parts, places of origin and attachment of the masticatory muscle, functions. 4. Temporal muscle: the place of origin and attachment, functions. 5. Medial pterygoid muscle: place of origin and attachment, functions. 6. Places of origin and attachment of the lateral pterygoid muscle, functions. Sources of development, general characteristics and classification of facial muscles. 7. Places of origin, attachment, functions of facial muscles. 8. Fascia of the head: masticatory, temporal, buccal-pharyngeal. The pterygomandibular raphe. 9. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 	-	4	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
3.3.	<p>Overview of the structure and functions of the muscles of the trunk and extremities</p> <ol style="list-style-type: none"> 1. Skeletal muscles: general information. 2. The structure of muscles of the trunk (educational film). 3. Muscles of chest and abdomen: its function, the «weak» places of abdominal wall. 4. Muscle work: operating mode, the strength of muscle contractions. 5. Biomechanics of extremity's muscles and principles of movement. 6. Muscles of extremities: clinical anatomy. <p>Functional anatomy of trunk and extremity muscles. Final control on the section «Myology». Credit</p> <ol style="list-style-type: none"> 1. Back muscles: superficial and deep, general characteristics, functions. 2. Chest muscles: superficial and deep, general characteristics, functions. 3. Diaphragm: topography, structure, functions. 4. Abdominal muscles: general morphofunctional characteristics. 5. Topography of the anterior abdominal wall: linea alba of the abdomen, the umbilical ring, the inguinal canal. Shoulder girdle muscles: general 	1	-	-	Electronic test.
3.3.	<p>Functional anatomy of trunk and extremity muscles. Final control on the section «Myology». Credit</p> <ol style="list-style-type: none"> 1. Back muscles: superficial and deep, general characteristics, functions. 2. Chest muscles: superficial and deep, general characteristics, functions. 3. Diaphragm: topography, structure, functions. 4. Abdominal muscles: general morphofunctional characteristics. 5. Topography of the anterior abdominal wall: linea alba of the abdomen, the umbilical ring, the inguinal canal. Shoulder girdle muscles: general 	-	4	6	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic

	morphofunctional characteristics.					workshop. Evaluation using virtual simulators. The evaluation is based on the module-rating system. Credit.
	6. Muscles of the free upper extremity: general morphofunctional characteristics.					
	7. Pelvic muscles: general morphofunctional characteristics					
	8. Muscles of the free lower extremity: general morphofunctional characteristics.					

Semester 2

		8	72	40	
4.	Cardiovascular system	2	12	6	
4.1.	Cardiovascular system. Circulation. Heart. Pericardium. Aorta 1. General characteristics and functions of the cardiovascular system. Circulatory circles. 2. The external structure of the heart: surfaces, edges, sulcus. 3. Chambers of the heart: morphofunctional characteristics of the atria and ventricles. 4. Right and left atrioventricular valves; aortic valve; pulmonary trunk valve: structure, purpose. 5. The structure of the heart wall: endocardium, myocardium, epicardium. 6. The conducting system of the heart. Nodes, atrioventricular bundle: their locations, function. 7. The structure of the pericardium. Pericardial cavity. 8. Blood supply to the heart: coronary arteries, their branches and areas of blood supply. Ways of venous blood outflow from the heart. 9. Aorta: parts, bifurcation site, terminal branches. 10. Branches of the aortic arch, areas of blood supply. 11. Parietal and visceral branches of the thoracic aorta. 12. Parietal and visceral branches of the abdominal aorta. 13. The names of the main arteries of the lower extremity and the patterns of their location. 14. Practical skills: visualization of anatomical formations on anatomical	-	4	2	Oral enquiry. Filling in flash cards. Test control. Electronic workshop, practical skills.

	preparations and other visual aids.					
	<p>Vessels of the head and neck</p> <ol style="list-style-type: none"> Common carotid artery: topography, branches. External and internal carotid arteries: general characteristics. External carotid artery: three groups of branches. Internal carotid artery: parts and branches, Willis's circle. Veins of the head and neck: general characteristics of the external, internal and superficial jugular vein. Sinuses of the dura mater of the brain. 	2	-	-	Electronic test.	
4.2.	<p>Arteries of the head, neck and upper extremity</p> <ol style="list-style-type: none"> Right and left common carotid arteries: places of departure, bifurcation, terminal branches. External carotid artery: branches, areas of blood supply. Maxillary artery: branches of the maxillary, pterygoid, pterygoid-palatine divisions; areas of blood supply. Internal carotid artery: parts, terminal branches, areas of blood supply. Functional value of dampers. Ophthalmic artery: branches and areas of blood supply. Subclavian artery: the places of departure of the right and left subclavian arteries, their course, division into departments. Branches of the 1st division of the subclavian artery, the area of blood supply. Arterial (Willis) circle of the big brain: meaning, sources of formation. Branches of the 2nd and 3rd divisions of the subclavian artery, the area of blood supply. The main arteries of the upper extremity: names, general principles of location. Places for determining the pulsation of the brachial and radial arteries. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; visualization of anatomical formations on images obtained using methods of radiological examinations. 	-	4	2	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.	
4.3.	Veins of systemic circulation. Lymphatic vessels, trunks and ducts	-	4	2	Oral enquiry, test control,	

	<ol style="list-style-type: none"> 1. Superior vena cava: sources of formation, topography. 2. Azygos and hemiazygos veins and their tributaries. 3. The main veins of the neck. Internal jugular vein: origins, topography. Intracranial tributaries: diploic, emissary, superior and inferior ophthalmic veins. Sinuses of the dura mater. 4. Extracranial tributaries of the internal jugular vein. The course and tributaries of the facial and submandibular veins. Pterygoid plexus. 5. External and anterior jugular veins. Jugular venous arch. 6. Subclavian vein. Principles of the organization of the venous bed of the upper extremity. 7. The inferior vena cava system. Parietal and visceral tributaries. 8. Portal vein of the liver. Functional significance of the portal system. 9. Principles of the organization of the venous bed of the lower extremity. 10. Lymphatic trunks and ducts. The sources of formation, the direction of the course, the place of confluence with the venous bed. 11. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids 		<p>a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop. Evaluation using virtual simulators, practical skills.</p>
5.	Lymphoid system	-	-
5.1.	<p>Regional lymph nodes of the head and neck. Final control on the section «Angiology»</p> <ol style="list-style-type: none"> 1. Lymphatic trunks and ducts. The sources of formation, the direction of the course, the place of confluence with the venous bed. 2. Topography of occipital, mastoid, superficial and deep parotid, facial, submandibular, submandibular nodes. Anterior and lateral cervical lymph nodes. 3. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 4. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids 	-	<p>Control quiz, a report on the practical household tasks and its oral defense. Electronic test, practical skills.</p>
6.	Endocrine glands	-	-
6.1	Morphofunctional characteristics of the pituitary gland, pineal gland, thyroid gland, parathyroid glands, adrenal gland	-	<p>Oral enquiry. Filling in flash cards. Electronic</p>

	<ol style="list-style-type: none"> 1. Pituitary gland: topography, structure. Pituitary hormones and their effect on body functions. 2. Pineal gland: topography, structure, functions. 3. General morphofunctional characteristics of the thyroid, parathyroid glands and adrenal glands. 4. Diffuse endocrine system. 			workshop. Control quiz. Colloquium.
7.	Nervous system	2	24	12
7.1.	<p>General plan of the structure of the nervous system. Spinal cord</p> <ol style="list-style-type: none"> 1. Nervous system: significance for the body, classification according to topographic and anatomical-functional principles. 2. Spinal cord: boundaries, divisions. The external structure of the spinal cord. 3. Anterior and posterior roots, cauda equina. A segment of the spinal cord. 4. The structure of the gray and white matter of the spinal cord. The central canal. 5. The brain: parts, departments. 6. Medulla oblongata: boundaries, external and internal structure. 7. Pons: borders, external and internal structure. 8. Rhomboid fossa. Fourth ventricle: walls, communication with the III ventricle and the subarachnoid space. 9. Cerebellum: the structure of gray and white matter. The peduncles of the cerebellum. 10. Midbrain: tectum of mesencephalon, cerebral peduncles, cerebral aqueduct. Topography of gray matter nuclei. 11. Reticular formation: localization and functional significance. 12. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 	-	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
7.2.	<p>Brain. Nerve pathways of brain and spinal cord</p> <ol style="list-style-type: none"> 1. Diencephalon: morphofunctional characteristic. 2. III ventricle: walls, communication with other cavities of the brain. 3. Cerebral hemisphere: surfaces, lobes, furrows, convolutions. 4. The area of localization of the somatomotor (the core of the motor 	-	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic

	<p>analyzer) and somatosensory cortex (the core of the analyzer of general sensitivity). Localization of the nuclei of auditory, visual and olfactory analyzers in the cerebral cortex.</p> <ol style="list-style-type: none"> 5. Basal nuclei and related structures. The white matter of the cerebral hemisphere: commissural, associative and projection nerve fibers. 6. Lateral ventricle: localization, parts, functional significance of the vascular plexus. 7. Classification of the pathways of the brain and spinal cord. The general plan of the structure of ascending (afferent) and descending (efferent) paths. 8. Ways of conducting general sensitivity from the head and neck. 9. The pathway of proprioceptive sensitivity from the muscles of the head and temporomandibular joint. 10. Motor conducting pathway to the muscles of the head and neck (cortical-nuclear tract). 11. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 		workshop. Evaluation using virtual simulators, practical skills.
7.3.	<p>Meninges. Peripheral nervous system. Spinal nerves. Cervical plexus</p> <ol style="list-style-type: none"> 1. Dura mater, pia mater and arachnoid mater s of the brain and spinal cord. 2. The structure of the dura mater of the brain, localization of outgrowths (processes). 3. Sinuses of the dura mater of the brain. Confluence of sinuses. 4. The arachnoid and pia mater of the brain. Subarachnoid space. Arachnoid granulations. 5. Places of formation and ways of circulation of cerebrospinal fluid. 6. Blood supply to the brain. Arterial circle of the brain. 7. Peripheral nervous system: nerves, nodes, plexuses. 8. Spinal nerve: sources of formation; branches and areas of their distribution. General principles of innervation of skin and skeletal muscles. 9. Cervical plexus: sources of formation; topography of sensory and motor branches; areas of innervation. 10. Phrenic nerve: fibrous composition, topography, areas of innervation. 	-	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

	<p>11. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; visualization of anatomical formations on images obtained using methods of radiological examinations</p>				
	<p>Functional and clinical anatomy of cranial nerves</p> <ol style="list-style-type: none"> 1. General characteristics of cranial nerves. 2. Mixed cranial nerves. 3. Motor cranial nerves. 4. Sensitive cranial nerves. 	1	-	-	Electronic test.
7.4.	<p>Cranial nerves. Anatomy of the oculomotor, trochlear, trigeminal and abducent nerves</p> <ol style="list-style-type: none"> 1. Cranial nerves: general characteristics; classification. 2. Oculomotor nerve [III]: nuclei, their localization and functional affiliation; the place of nerve exit from the brain and cranial cavity; areas of innervation. 3. Trochlear [IV] nerve: nucleus, localization and functional affiliation; place of nerve exit from the brain and cranial cavity; area of innervation. 4. Trigeminal nerve [V]: nuclei, their localization and functional affiliation; motor and sensory roots; place of nerve exit from the brain; trigeminal ganglion. 5. Branches of the trigeminal nerve and the places of their exit from the cranial cavity. 6. Ophthalmic nerve [V1]: branches, areas of innervation. 7. Maxillary nerve [V2]: branches, areas of innervation. 8. Mandibular nerve [V3]: branches, qualitative composition of nerve fibers; areas of innervation. 9. The abducent nerve [VI]: the nucleus, localization and functional affiliation; the place of nerve exit from the brain and the cranial cavity; the area of innervation. 10. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 	-	4	2	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
7.4.	<p>Cranial nerves. Anatomy of the facial, glossopharyngeal, vagus,</p>	-	4	2	Oral enquiry, test control,

	<p>accessory and hypoglossal nerves</p> <ol style="list-style-type: none"> 1. Facial nerve [VII]: the nucleus of the facial nerve, the nerve exit points from the brain and the cranial cavity; branches, areas of innervation. 2. Intermediate nerve: nuclei, their localization and functional affiliation; geniculate ganglion; branches, qualitative composition of nerve fibers, areas of innervation. 3. Glossopharyngeal nerve [IX]: nuclei, their localization and functional affiliation; places of nerve exit from the brain and cranial cavity; sensitive nodes; branches, qualitative composition of nerve fibers, areas of innervation. 4. Vagus nerve [X]: nuclei, their localization and functional affiliation; the place of nerve exit from the brain and cranial cavity; departments. Areas of innervation. 5. Accessory nerve [XI]: nuclei, their localization and functional affiliation; places of nerve exit from the brain and cranial cavity; areas of innervation. 6. Hypoglossal nerve [XII]: the nucleus, its localization and functional affiliation; places of nerve exit from the brain and cranial cavity; areas of innervation; connection with the cervical plexus. 7. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 			<p>a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.</p>
	<p>Autonomic part of the peripheral nervous system</p> <ol style="list-style-type: none"> 1. Features of the structural organization. 2. Segmental and suprasedgmental centers of regulation of vegetative functions. 3. Reflex arc of the vegetative reflex. 4. Sympathetic and parasympathetic part of the autonomic nervous system. 5. Vegetative innervation of the organs of the head and neck. 	1	-	Electronic test.
7.5.	<p>Autonomic part of the peripheral nervous system</p> <ol style="list-style-type: none"> 1. The autonomous department of the peripheral nervous system: general principles of structure and function, areas of innervation. 2. Differences in the structure of the autonomous and somatic 	-	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in

	<p>departments of the peripheral nervous system.</p> <p>3. Division of the autonomous department of the peripheral nervous system into sympathetic and parasympathetic parts, their structural and functional differences.</p> <p>4. Morphofunctional characteristics of the sympathetic part of the autonomous department of the peripheral nervous system.</p> <p>5. Morphofunctional characteristics of the parasympathetic part of the autonomous department of the peripheral nervous system. Parasympathetic component of cranial nerves.</p> <p>6. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids</p>	-	8		flash cards. Electronic workshop, practical skills.
8.	Sense organs	-	8	4	
8.1.	<p>Structural and functional characteristics of the organ of hearing and balance</p> <p>1. The external ear: the auricular pinna and the external auditory canal; structure, blood supply, innervation, lymph outflow pathways. The eardrum (tympanic membrane): parts, layers.</p> <p>2. Middle ear: tympanic cavity, auditory ossicles, auditory tube, cells of the mastoid process. Blood supply, innervation, lymph outflow.</p> <p>3. Inner ear: divisions; structure of the bony and membranous labyrinth.</p> <p>4. Vestibular-cochlear nerve (VIII): nuclei; places of nerve exit into the cranial cavity and brain.</p> <p>5. Conducting pathway of auditory and statokinetic analyzers.</p> <p>6. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids</p>	-	4	2	Oral enquiry, test control. Filling in flash cards. Electronic workshop, practical skills.
8.2.	<p>Eye and related structures. The final control on the sections «Neurology. Esthesiology»</p> <p>1. The organ of vision: the general plan of the structure, functions.</p> <p>2. Tunica fibrosa of the eyeball: parts, structure and functional significance.</p> <p>3. Tunica vascularis of the eyeball: parts, structure, functions.</p> <p>4. Internal (smooth) muscles of the eyeball: localization, innervation and blood supply.</p>	-	4	2	Oral enquiry, a report on the practical household tasks and its oral defense. Control enquiry. Colloquium. Electronic test.

	<ol style="list-style-type: none"> 5. Retina: parts, structure. 6. Inner core of the eye: aqueous humor of the eye chambers, lens, vitreous body. Aqueous humor formation and outflow pathway. 7. Auxiliary structures of the eye. External muscles of the eyeball: places of origin and attachment; functional significance. 8. Eyelids: structure, functional significance. Conjunctiva. 9. Lacrimal apparatus: lacrimal gland; lacrimal pathways; lacrimal sac; nasolacrimal duct. 10. The conducting path of the visual analyzer. Optic nerve (II). 11. Innervation and blood supply of the eyeball, external muscles and lacrimal gland. 12. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 	2	12	8	
9.	<p>Digestive system</p> <p>Functional anatomy of the digestive system</p> <ol style="list-style-type: none"> 1. Introduction to splanchnology. 2. Anatomy of the anterior abdominal wall. 3. Methods of examination of internal organs. 4. The general plan of the structure and function of the digestive system. 5. Functional conditionality of the structure of the digestive system. 	2	-	-	Electronic test.
9.1.	<p>General characteristics of the digestive system. The structure of the organs of the oral cavity and major salivary glands</p> <ol style="list-style-type: none"> 1. Oral cavity: departments, borders. 2. The structure of the upper and lower lip. Blood supply, innervation, regional lymph nodes. 3. Hard palate: relief of the mucous membrane. Blood supply and innervation of the mucous membrane of the hard palate. 4. Soft palate: palatal uvula, palatopharyngeal and palatopharyngeal arches, tonsillar fossa and palatine tonsil. Blood supply, innervation of the mucous membrane of the soft palate, regional lymph nodes. 5. Muscles of the soft palate and pharynx: places of origin and attachment; functions, innervation and blood supply. 6. The floor of the oral cavity: relief of the mucous membrane; muscle 	-	4	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

	<p>base, innervation, blood supply, regional lymph nodes.</p> <p>7. Tongue: parts; surfaces; relief of the mucous membrane, sources of blood supply and innervation; regional lymph nodes.</p> <p>8. Muscles of the tongue: places of origin and attachment, functions; innervation.</p> <p>9. General morphofunctional characteristics of teeth: structure, groups of teeth; dental formula. Blood supply sources, dental innervation, regional lymph nodes.</p> <p>10. Parotid, submandibular, sublingual glands: structure; excretory ducts. Blood supply, innervation, regional lymph nodes.</p> <p>11. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>			
9.2.	<p>Pharynx, esophagus, stomach, small and large intestine</p> <p>1. Pharynx: functions, departments; synotropy and skeletotopy; layers of the wall. Communication of the pharynx with the nasal cavity, middle ear, laryngeal cavity and esophagus. Pharyngeal lymphoid ring.</p> <p>2. Muscles and fascia of the pharynx: places of origin and attachment, functions; pterygomandibular raphe.</p> <p>3. Blood supply, innervation of the mucous membrane and muscles of the pharynx. Regional lymph nodes of the pharynx.</p> <p>4. Esophagus: parts, topography, layered structure of the wall. Blood supply, innervation, regional lymph nodes.</p> <p>5. Stomach: functions, synthtopia, skeletotopy, holotopy.</p> <p>6. Parts of the stomach, openings, layered structure of the wall; blood supply, innervation. Location and functional significance of stomach sphincters.</p> <p>7. Morphofunctional characteristics of the small intestine; layered structure of the wall. Blood supply, innervation.</p> <p>8. Duodenum: topography, relation to the peritoneum, parts. Localization and functional significance of the major and minor papillae.</p> <p>9. Colon: functions, departments, features of the wall structure, blood supply, innervation.</p> <p>10. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids</p>	-	4	2
				Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

9.3.	<p>Liver. Pancreas. Peritoneum</p> <ol style="list-style-type: none"> 1. Liver: functions, topography, surfaces, edges, lobes. Fixing structures of the liver. 2. Sulcus of the visceral surface of the liver and their contents. Porta of liver. Sources of blood supply and liver innervation. 3. Gallbladder: functions, localization, parts. Ways of excretion of bile. 4. Pancreas: functions; topography; structure; excretory ducts; blood supply, innervation. 5. Parietal and visceral peritoneum. The abdominal cavity. The ratio of the abdominal organs to the peritoneum. 6. Derivatives of the peritoneum: mesentery, omentum, ligaments, omental bursa; subdiaphragmatic and subhepatic recesses, lateral canals, mesenteric sinuses. 7. Planes, lines and abdominal areas. Superficial anatomy of the abdomen (projection of organs on the skin). The layered structure of the anterolateral wall of the abdominal cavity. 8. «Weak» places of the anterolateral wall of the abdominal cavity. Inguinal canal: walls, openings, contents. 9. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 	-	4	2	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop. Evaluation using virtual simulators, practical skills.
10.	<p>Respiratory system</p>	1	4	2	
	<p>Functional anatomy of the respiratory system</p> <ol style="list-style-type: none"> 1. Chest. External landmarks and lines. 2. Functions of the respiratory system. 3. Anatomy of the respiratory tract. 4. Structure and functions of the lungs. 5. Pleura, mediastinum. 	1	-	-	Electronic test.
10.1.	<p>General characteristics of the respiratory system. The macroscopic structure of the nose, larynx, trachea. Luugs. Chest cavity</p> <ol style="list-style-type: none"> 1. General characteristics of the respiratory system: functions, division into upper and lower airways. 2. The external nose, bones and cartilage forming its base. 3. Nasal cavity: nasal passages, communication with the paranasal 	-	4	2	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop. Evaluation
10.2.					

	<p>sinuses and orbit.</p> <p>4. Paranasal sinuses: development, structure of the maxillary, sphenoid, frontal, ethmoid sinuses.</p> <p>5. Sources of blood supply and innervation of the skin of the external nose, the mucous membrane of the walls of the nasal cavity, the lymph outflow pathways.</p> <p>6. Structural and functional characteristics of the olfactory organ. Olfactory nerve (I). The conducting path of the olfactory analyzer.</p> <p>7. Larynx: topography, functions, structure. Laryngeal cavity: departments.</p> <p>8. Sources of blood supply and innervation of the muscles and mucous membrane of the larynx.</p> <p>9. Trachea: topography, wall structure, bifurcation level.</p> <p>10. The main bronchi, the structure of the wall. Bronchial tree. Blood supply, innervation of the trachea and bronchi, lymph outflow.</p> <p>11. Lungs: functions, topography, macroscopic structure. Innervation, blood supply, lymph outflow.</p> <p>12. Pleura: borders, divisions. Pleural cavity and pleural sinuses.</p> <p>13. Mediastinum: boundaries, division into upper and lower divisions, mediastinal organs.</p> <p>14. Superficial anatomy of the chest. The walls of the chest cavity.</p> <p>15. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>		using virtual simulators, practical skills.	
11.	Urinary system. Reproductive systems	1	8	6
11.1.	Anatomy of the urinary system organs. Structure of the internal and external organs of male reproductive system	-		2
11.2.	<p>1. General plan of the structure and function of the organs of the urinary system.</p> <p>2. Kidney: topography, structure. The fixing apparatus of the kidney.</p> <p>3. Nephron as a structural and functional unit of the kidney. Blood supply and innervation of the kidney.</p> <p>4. Ureter, bladder: functions, structure.</p> <p>5. Female urethra: structure, internal and external openings, localization</p>		Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.	

	of sphincters. Male urethra: parts, constrictions, bends, localization of sphincters. 6. The general plan of the structure of the male reproductive system. 7. The structure and functions of the testis. Spermatogenesis and sperm elimination pathway (straight tubules, rete testis, efferent ducts, epididymis duct, duct deferens, ejaculatory duct, male urethra). 8. Prostate, seminal vesicle, bulbourethral gland. 9. External male genitalia: penis, scrotum. Functions and general plan of the structure of the female genital system. 10. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.					
	Functional anatomy of the male and female reproductive systems 1. The system of male gender organs. 2. The system of female gender organs.	1	-	-	Electronic test.	
11.3.	Functional morphology of female reproductive organs. The final control on the section «Spiachnology» 1. Ovary: functions, topography, structure, relation to the peritoneum; blood supply, innervation. 2. Uterus: functions, topography, structure. Ligaments of the uterus, relation to the peritoneum; blood supply, innervation. 3. Fallopian tube: function, structure, relation to the peritoneum. 4. Vagina: synthiopia, wall structure. 5. External female genitalia: functions, structure.	-	4	2	Control enquiry, control tests, computer tests. A report on the practical household tasks and its oral defense. Colloquium. The evaluation is based on the module-rating system. Credit.	
Semester 3						
	Anatomy of head and neck	-	36	54		
12.	Development, structure, function, blood supply and innervation of neck muscles. Fascia of the neck. Cellular spaces of the neck 1. The upper and lower border of the neck. 2. Projection of the following anatomical formations on the skin of the neck: common, external, internal carotid and subclavian arteries; sensitive branches of the cervical plexus; supraclavicular part of the	-	36	54		
12.1.		-	3	4	Oral enquiry. Test control. Electronic workshop, practical skills.	

	brachial plexus; phrenic nerve; submandibular gland; isthmus of the thyroid gland; internal, external and anterior jugular veins. 3. Dividing the neck into areas; their boundaries. 4. The boundaries of the neck triangles. 5. Superficial, suprahyoid, infrahyoid and deep muscles of neck: places of origin, insertion, function; sources of blood supply and innervation. 6. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.	-	3	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
12.1.	Fascia of the neck. Classification according to V.N. Shevkunenko and International Anatomical Terminology. Cellular spaces of the neck 1. Classification of neck fascia according to V. N. Shevkunenko and International anatomical terminology. 2. Classification of cellular spaces of the neck. 3. Topography and contents of cellular spaces of the neck, communication with cellular spaces of other areas of the human body. 4. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.	-	3	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
12.2.	Vessels and nerves of the neck. Spinal nerves. The cervical plexus. Cervical sympathetic trunk 1. Structural components of the main neurovascular bundle of the neck and their mutual disposition. 2. Spinal nerves: branches, areas of innervation. 3. Sources of formation and topography of the cervical plexus. 4. Areas of branching of the cutaneous branches of the cervical plexus. 5. The course of the diaphragmatic nerve, areas of innervation. 6. Sources of formation of the neck loop, areas of innervation. 7. Cervical sympathetic trunk. Topography, nodes, branches, area of innervation. 8. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.	-	3	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
12.2.	Structural and functional characteristics of the lingual (IX), vagus (X), accessory (XI) and hypoglossal (XII) nerves 1. The nuclei of the glossopharyngeal nerve (IX): names, localization in	-	3	4	Oral enquiry, test control, a report on the practical household tasks and its

	<p>the brain stem. Branches of the glossopharyngeal nerve: qualitative composition of nerve fibers and anatomical structures that they innervate.</p> <p>2. Vagus nerve nuclei (X): names, localization in the brain stem. Branches of the cervical vagus nerve: the qualitative composition of nerve fibers and the areas that they innervate.</p> <p>3. Topography of the superior laryngeal nerve; areas of innervation.</p>			oral defense. Filling in flash cards. Electronic workshop, practical skills.
	<p>4. Topography of the recurrent laryngeal nerve; areas of innervation.</p> <p>5. List the organs of the thoracic and abdominal cavities innervated by the vagus nerve. Describe the effect of the vagus nerve on the functions of these organs.</p> <p>6. The main clinical symptoms of lesion of the vagus nerve and its branches.</p> <p>7. Nuclei of the accessory nerve (XI): names, localization in the brain stem. Neck muscles innervated by the accessory nerve.</p> <p>8. Hypoglossal nerve (XII): localization of the nucleus in the brain stem. the place of exit from the brain and the cranial cavity.</p> <p>9. Topography of the trunk of the hypoglossal nerve in the neck; participation in the formation of the ansa cervicalis; innervated structures.</p> <p>10. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>			
12.3.	<p>Neck organs: skeleton, holotopia, synthopia; sources of blood supply, innervation and lymph outflow pathways.</p> <p>1. Skeleton, synthopia, the structure of the pharyngeal wall. Sources of blood supply, lymph outflow pathways, innervation.</p> <p>2. Topography, sources of blood supply, lymph outflow pathways, innervation of the cervical esophagus.</p> <p>3. Skeleton and synthopy of the larynx. Departments of the laryngeal cavity. Features of the structure of the submucosal base of the larynx in children.</p> <p>4. Sources of blood supply, lymph outflow pathways, innervation of muscles and laryngeal mucosa.</p> <p>5. Skeleton, synthopy and the structure of the tracheal wall. Sources of</p>	-	3	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.

12.4.	<p>blood supply, lymph outflow pathways, innervation.</p> <p>6. Topography of the thyroid gland and parathyroid glands; sources of blood supply, lymph outflow pathways and innervation.</p> <p>7. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>	-	3	4	Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.
12.5.	<p>Development, structure, blood supply and innervation of anatomical formations of the head. Bone base and soft tissues of the face.</p> <ol style="list-style-type: none"> 1. The border of the head and neck. Division of the head into facial and cerebral divisions. Areas of the facial part of the head; the proportions of the face and the division into thirds. 2. Sources of facial skin innervation. Projection of the exit points under the skin of the sensitive branches of the trigeminal nerve. 3. Sources of blood supply to the face; topography of the facial, superficial temporal arteries, parotid duct. 4. Ways of venous blood outflow from the skin of the face; venous anastomoses and their significance in the spread of infection. 5. Regional lymph nodes of the head. Ways of lymph outflow from the facial part of the head. 6. Morphofunctional characteristics of facial muscles: places of origin and attachment, orientation of fibers, functions; blood supply. 7. Topography of the motor branches of the facial nerve, parotid plexus. Clinical manifestations of the lesion of the facial nerve after exiting the foramen. 8. Macro- and microscopic features of the structure of the upper and lower jaw. Localization sites of typical fractures of the upper and lower jaw. 9. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. <p>The eye and its associated structures. The nose area. Topography of the paranasal sinuses</p> <ol style="list-style-type: none"> 1. Bones forming the walls of the orbit. Communication of the orbit with the skull cavity and other areas of the head. 2. The membranes of the eyeball: fibrous, vascular, internal (retina). 	-	3	4	Oral enquiry, a report on the practical household tasks and its oral defense. Electronic test Electronic workshop, practical skills.

	<ol style="list-style-type: none"> 3. The optic nerve (II). The conducting path of the visual analyzer. 4. The structure of the lens, vitreous body. Eyeball cameras. Formation and outflow of watery moisture. 5. Auxiliary structures of the eye. External muscles of the eyeball, sources of innervation and blood supply. 6. Layered structure of the eyelids. Conjunctiva. The lacrimal apparatus. Innervation, blood supply. 7. The vagina of the eyeball. The adipose body of the orbit, connections with cellular spaces of the face. 8. Clinical manifestations of damage to the nerves of the orbit. 9. The boundaries of the nose area. External nose: structure, innervation, blood supply, lymph outflow pathways. Bone walls of the nasal cavity. 10. Nasal shells and nasal passages. Communication of the nasal cavity with the paranasal sinuses. Nasolacrimal canal. 11. Innervation, blood supply and lymph outflow from the nasal mucosa. Localization and functional significance of the Kesselbach venous plexus. 12. Morphofunctional characteristics of the paranasal sinuses (topography, structure, meaning). The timing of formation in ontogenesis; sources of innervation, blood supply and lymph outflow pathways from the mucous membrane of the paranasal sinuses. 13. Indications and techniques for performing tamponade of the nasal cavity and nasopharynx. 14. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 			
12.6.	<p>Cranial part of the head. The skeleton of the cerebral skull. Topography of the base and calvaria of the skull. Fibrous and cartilaginous joints of the skull. Skull shapes</p> <ol style="list-style-type: none"> 1. The border of the facial and cerebral parts of the head. Areas that are part of the cranial part of the head. 2. Projection on the skin of the superficial temporal, posterior auricular and occipital arteries; supraorbital, auricular, large and small occipital nerves. 	-	3	4 Oral enquiry, a report on the practical household tasks and its oral defense. Electronic test. Electronic workshop, practical skills.

12.7.	<p>3. Boundaries and layered structure of the frontal-parietal-occipital region.</p> <p>4. Sources of blood supply, innervation and ways of lymph outflow from the skin of the frontal-parietal-occipital region. Anatomical landmarks for performing conduction anesthesia.</p> <p>5. Occipito-frontal muscle: places of origin and attachment, function, sources of blood supply and innervation.</p> <p>6. Cellular spaces of the frontal-parietal-occipital region. Localization of hemorrhages in injuries of the frontal-parietal-occipital region.</p> <p>7. Features of the macro and microscopic structure of the bones of the cranial vault. Types of seams.</p> <p>8. Meninges; localization of subdural and subarachnoid spaces.</p> <p>9. Ways of circulation of cerebrospinal fluid.</p> <p>10. Anastomoses between the sinuses of the dura mater and the veins of the soft tissues of the head: diploic and emissary veins.</p> <p>11. Boundaries and layered structure of the temporal region.</p> <p>12. Temporal muscle: places of origin and attachment, functions, sources of blood supply and innervation.</p> <p>13. The bony base of the temporal region. Features of the structure of the scaly part of the temporal bone. Joints of the bones of the temporal fossa.</p> <p>14. Localization and characterization of cellular spaces of the temporal region.</p> <p>15. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>		
	<p>Anatomy of the oral cavity. Layered structure of the walls of the oral vestibule and the oral cavity proper</p> <p>1. The boundaries of the oral vestibule. The layered structure of the lip.</p> <p>2. Sources of blood supply and innervation of the skin, mucous membrane and muscles; ways of lymph outflow from the upper and lower lip.</p> <p>3. The boundaries of the oral cavity proper. Layered structure of the soft and hard palate; sources of blood supply and innervation of the mucous membrane of the soft palate.</p>	-	<p>3</p> <p>4</p> <p>Oral enquiry, test control, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic workshop, practical skills.</p>

<p>12.7.</p>	<p>4. Muscles of the soft palate: blood supply and innervation; the main clinical manifestations of violation of their innervation.</p> <p>5. Periodontium: gingival (parts, interdental papilla, gingival sulcus) and attached (desmodont); cementum; alveolar bone.</p> <p>6. Relief of the mucous membrane of the floor of the oral cavity: sublingual papilla, sublingual fold, frenulum of the tongue.</p> <p>7. Muscles of the floor of the oral cavity: morphofunctional characteristics, sources of blood supply and innervation. Intermuscular spaces.</p> <p>8. Parts, surfaces, sulcus of the tongue. Location of the lingual tonsil.</p> <p>9. Foramen cecum of the tongue: localization, origin, connection with median cysts and fistulas of the neck.</p> <p>10. Muscle groups of the tongue: places of origin, attachment, function.</p> <p>11. Sources of blood supply and innervation of the mucous membrane and muscles of the tongue, pathways of venous outflow and lymph outflow.</p> <p>12. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids.</p>		
	<p>Structure and function of the masticatory muscles. TMJ. Sources of blood supply and innervation</p> <p>1. Morphofunctional characteristics of the temporomandibular joint (TMJ):</p> <ul style="list-style-type: none"> - mandibular fossa and articular tubercle of the scaly part of the temporal bone; - the head of the lower jaw; - articular disc: macro -microscopic anatomy and fixation device of the disc; - rear disk (hydraulic) cushion, its structure and functions; - joint capsule and joint ligaments. <p>2 Temporal muscle: places of origin and attachment of its layers, functions. Temporal fascia.</p> <p>3. Masticatory muscle: superficial and deep parts, their origin, attachment, functions. Intramuscular intersection and pterygoid-masseteric loop. their meaning. Masseteric fascia</p>		

	<p>(parotidomasseteric fascia).</p> <ol style="list-style-type: none"> 4. Medial and lateral pterygoid muscles: their origin, attachment and functions. Features of the functional anatomy of the lateral pterygoid muscle. Pterygoid fascia. 5. Innervation and blood supply of the temporomandibular joint and masticatory muscles. Regional lymph nodes. 6. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids. 			
12.8.	<p>Anatomy of teeth. General anatomy of permanent teeth; sources of blood supply and innervation, regional lymph nodes. Morphological justification of dental anesthesia</p> <ol style="list-style-type: none"> 1. The number and groups of teeth of permanent bite. Options for recording formulas of permanent teeth. 2. Parts of the tooth: crown, neck, root. Definition of the concepts «clinical crown» and «clinical root». How does their ratio change during the development and functioning of the tooth? 3. The crown surfaces of the anterior and lateral teeth. 4. Elements of the crown relief: bumps, scallops, rollers, belt, cracks, pits. 5. The equator of the tooth and its value. 6. The number of roots in teeth of different groups. The name of the roots in multi-rooted teeth. 7. The structure of the root in a fully formed tooth, variants of the structure of the root canal. 8. Dividing the crown and root of the tooth into thirds. 9. The relationship of the roots of permanent teeth with the lower wall of the maxillary sinus, the nasal cavity, the canal of the mandible. 10. The structure and contents of the tooth cavity. 11. Determination of the signs of the tooth belonging to the right or left half of the dental arch. 12. The timing of eruption of permanent teeth. 13. Blood supply and lymph outflow routes from the teeth of the maxilla and mandible. 14. Innervation of teeth and gums of the maxillae. 	-	3	6

Oral enquiry, a report on the practical household tasks and its oral defense. Filling in flash cards. Electronic test.

12.8.	<p>15. Innervation of the teeth and gums of the mandible.</p> <p>16. Practical skills: visualization of anatomical formations on anatomical preparations and other visual aids; visualization of anatomical formations on images obtained using methods of radiological examinations, modeling of formations of the dental system.</p>	-	3	6	<p>Reports at laboratory classes, reports at scientific conferences. Presentations, abstracts. Publication of a scientific article. Assessment based on a modular rating system. Exam.</p>
<p>1. Individual variability of the structure of the dental system. Educational and research work of students</p> <ol style="list-style-type: none"> 1. Individual features of the shape and size of permanent teeth. 2. The thickness of the walls of the front teeth. Security zones. 3. The thickness of the walls of the lateral teeth. Security zones. 4. The dependence of the shape of the teeth on the configuration of the face. 5. The color of the teeth. 6. Anomalies in the color of teeth. 7. Various manifestations of anomalies in the color of permanent human teeth. 8. Resorption of the roots of milk teeth. 9. The timing of eruption and formation of the roots of permanent teeth. 10. Features of the structure of the alveolar process in children. 11. Congenital cleft of the upper lip and palate. 12. Anatomical and topographic features of the middle zone of the face. Traumatic injuries of the middle zone of the face. 13. Features of the structure of the maxillofacial region of the child. 14. Age-related anatomy of the tooth cavity. Deltoid branching of the root canal. Additional root canals. 15. Some aspects of the evolutionary theory of dental development from the point of view of a dentist. 16. Age-related anatomy of the cerebral and facial skull. Abnormal forms of the calvaria of the skull.. 17. Malocclusion. 18. Dental manifestations of congenital diseases and syndromes. 19. Anesthesia methods used in dentistry. 20. Phlegmons of the bottom of the oral cavity. 21. The use of implants in dentistry. 					

22. Modern methods of visualization of anatomical structures in dentistry.					
Total 300 hours	15	144	141		

INFORMATION AND INSTRUCTIONAL UNIT

LITERATURE

Basic (relevant):

1. Sapin M. R. Textbook of human anatomy. In 2 volumes. V.1. – Moscow, 2019, - 416 p.
2. Sapin M. R. Textbook of human anatomy. In 2 volumes. V.2. – Moscow, 2019, - 480 p.
3. Netter, Frank H. Atlas of human anatomy / Netter, Frank H. - 5th ed., 6th ed, 7th ed - USA: Elsevier, 2019 - 585 p.

Additional:

1. Gray's anatomy: the anatomical basis of clinical practice. - 41st ed. - Elsevier, 2016.
2. Drake R. Z. Grays anatomy for students.- Philadelphia, 2010. - 1103 p.
3. Norton, Neil S. Netter's head and neck anatomy for dentistry / Norton, Neil S. ; ill. by F. H. Netter. - 3rd ed. - Philadelphia : Elsevier, 2017 - 698 p.
4. Sobotta anatomy textbook / eds.: F. Paulsen, J. Waschkeio – 1st ed. - Munchen : Elsevier, 2019 - 824 p.

METHODOLOGICAL RECOMMENDATIONS FOR THE ORGANIZATION AND PERFORMANCE OF STUDENT INDEPENDENT WORK IN THE ACADEMIC DISCIPLINE

The time allotted for independent work can be used by students for:

- writing and presenting an abstract;
- presentation of the report;
- study of topics and problems that are not brought to lectures;
- computer testing;
- completing tasks in workshops;
- preparation of tests by students for the organization of mutual control;
- production of mockups, laboratory teaching aids.

LIST OF AVAILABLE DIAGNOSTIC TOOLS

The following forms are used to diagnose competencies:

Oral form:

- interviews;
- colloquiums;
- reports at scientific conferences.

Written form:

- tests;
- control works;
- abstracts;
- filling in flash cards;
- publications of articles, reports.

Oral-written form:

reports on classroom practical tasks with their oral defense;
 reports on home practical tasks with their oral defense;
 credits;
 exam;

Technical form:

electronic tests;
 electronic workshops;

Simulation form:

evaluation using virtual simulators.

LIST OF AVAILABLE TEACHING METHODS

Traditional method (lecture, laboratory practicals);

Active (interactive) methods:

problem-based learning PBL (Problem-Based Learning);
 research-based learning RBL (Research-Based Learning);
 training based on simulation technologies;
 electronic training programs.

LIST OF PRACTICAL SKILLS

1. Visualization of anatomical formations on anatomical preparations and other visual aids.
2. Visualization of anatomical formations on images obtained using radiation diagnostics methods.
3. Palpation of the surface landmarks of the human body (bone, muscle and others) to determine the boundaries of areas, projection of organs, vessels, nerves.
4. Modeling of formations of the dental system.

LIST OF EQUIPMENT USED

1. The human skeleton.
2. A set of vertebrae.
3. The sacrum.
4. Sternum.
5. Ribs.
6. Bones of the shoulder girdle.
7. Bones of the free upper extremity.
8. Bones of the pelvic girdle.
9. Bones of the free lower extremity.
10. The skull.
11. Occipital bone.
12. The frontal bone.
13. Sphenoid bone.
14. Ethmoid bone.
15. Temporal bone.

16. Maxilla.
17. Mandible.
18. The base of the skull.
19. The calvarium of the skull.
20. Anatomical preparations: whole heart, open heart, brain (base, sagittal section, brain stem), sagittal section of the head, permanent and primary teeth, tongue, stomach, duodenum with pancreas, liver with gallbladder, complex lungs with heart, larynx, larynx with thyroid gland, kidney (whole, longitudinal section), uterus with appendages.
21. Sets of tablets.
22. Tables.
23. Anatomical models.
24. Flash cards.
25. Anatomical atlases.
26. Museum anatomical preparations.
27. Training hardware complex «Anatomical table».
28. Computer classes, projection equipment.
29. Training computer programs.

LIST OF LECTURES

1 semester

1. General osteology and arthrosyndesmology.
2. Ontogenesis of skull bones. Anatomy of the facial skeleton.
3. Anatomy of the temporomandibular joint.
4. Morphofunctional characteristics of the muscles of the head and neck.
5. General overview of the muscles of the trunk and limbs.

2 semester

1. Vessels of the head and neck.
2. Functional and clinical anatomy of cranial nerves.
3. Autonomic department of the peripheral nervous system.
4. Functional anatomy of the digestive system.
5. Functional anatomy of the respiratory system.
6. Functional anatomy of the male and female reproductive systems.

LIST OF LABORATORY CLASSES

1 Semester

1. Anatomy as an academic discipline. The axial skeleton. Vertebral column. Thorax skeleton.
2. Skull. The bones of the cerebral skull.
3. Skull. Bones of the facial skull.
4. Skull as a whole. Frontal, lateral, posterior, superior aspects. Age anatomy of the skull.

5. The appendicular skeleton. Skeleton of upper and lower limbs.
6. Classification of bone connection. Connection of cranium bones. Connection of bones of the trunk, upper and lower limbs. The final control on the sections «Osteology. Arthrosyndesmology».
7. General characteristics of muscles. Neck muscles. Neck fascia.
8. Muscles and fascia of the head.
9. Functional anatomy of trunk and extremity muscles. The final control on the section «Myology».

2 semester

1. Cardiovascular system. Circulation. Heart. Pericardium. Aorta.
2. Arteries of the head, neck and upper extremity.
3. Veins of systemic circulation. Lymphatic vessels, trunks and ducts.
4. Regional lymph nodes of the head and neck. Final control on the section «Angiology». Morphofunctional characteristics of endocrine glands.
5. General plan of the structure of the nervous system. Spinal cord
6. Brain. Nerve pathways of brain and spinal cord.
7. Meninges. Peripheral nervous system. Spinal nerves. Cervical plexus.
8. Cranial nerves. Anatomy of the oculomotor, trochlear, trigeminal and abducent nerves.
9. Cranial nerves. Anatomy of the facial, glossopharyngeal, vagus, accessory and hypoglossal nerves.
10. Autonomic part of the peripheral nervous system.
11. Structural and functional characteristics of the organ of hearing and balance.
12. Eye and related structures. The final control on the sections «Neurology. Esthesiology».
13. General characteristics of the digestive system. The structure of the organs of the oral cavity and major salivary glands.
14. Pharynx, esophagus, stomach, small and large intestine.
15. Liver. The pancreas. Peritoneum.
16. General characteristics of the respiratory system. The structure of the nose, larynx, trachea. Lungs. Chest cavity.
17. The structure of the organs of the urinary system. Functional morphology of male genitalia.
18. Functional morphology of female genital organs. The final lesson in the section «Splanchnology».

3 semester

1. Development, structure, blood supply and innervation of anatomical formations of the neck. Neck muscles.
2. Neck fascia: classification according to V.N. Shevkunenko and International Anatomical Terminology. Cellular spaces of the neck.
3. Vessels and nerves of the neck. Spinal nerves. The cervical plexus. Cervical sympathetic trunk.
4. Structural and functional characteristics of the glossopharyngeal [IX], vagus [X], accessory [XI] and hypoglossal [XII] nerves.
5. Neck organs: skeletotopy, holotopia, synthtopia; sources of blood supply, innervation and lymph outflow pathways.
6. Development, structure, blood supply and innervation of anatomical formations of the head. Bone base and soft tissues of the face.
7. The eye and its associated structures. The nose area. Topography of the paranasal sinuses.
8. Cranial department of the head. The skeleton of the cerebral skull. Topography of the base and calvaria of the skull. Fibrous and cartilaginous joints of the skull. Skull shapes.
9. Anatomy of the oral cavity. Mouth area. Layered structure of the walls of the oral vestibule and the oral cavity proper.
10. Structure and function of the masticatory muscles. TMJ. Sources of blood supply and innervation.
11. Anatomy of teeth. General anatomy of permanent teeth; sources of blood supply and innervation, regional lymph nodes. Morphological justification of dental anesthesia.
12. Individual variability of the structure of the dental system. Educational and research work of students.

APPROXIMATE TOPICS OF SCIENTIFIC CONFERENCES

1. Individual features of the shape and size of permanent teeth.
2. The thickness of the walls of the front teeth. Security zones.
3. The thickness of the walls of the lateral teeth. Security zones.
4. The dependence of the shape of the teeth on the configuration of the face.
5. The color of the teeth.
6. Anomalies in the color of teeth.
7. Various manifestations of anomalies in the color of permanent human teeth.
8. Resorption of the roots of milk teeth.
9. The timing of eruption and formation of the roots of permanent teeth.
10. Features of the structure of the alveolar process in children.
11. Congenital cleft of the upper lip and palate.
12. Anatomical and topographic features of the middle zone of the face. Traumatic injuries of the middle zone of the face.
13. Features of the structure of the maxillofacial region of the child.

14. Age-related anatomy of the tooth cavity. Deltoid branching of the root canal. Additional root canals.
15. Some aspects of the evolutionary theory of dental development from the point of view of a dentist.
16. Age-related anatomy of the cerebral and facial skull. Abnormal forms of the calvaria of the skull.
17. Malocclusion.
18. Dental manifestations of congenital diseases and syndromes.
19. Anesthesia methods used in dentistry.
20. Phlegmons of the bottom of the oral cavity.
21. The use of implants in dentistry.
22. Modern methods of visualization of anatomical structures in dentistry.

**PROTOCOL OF THE CURRICULUM APPROVAL
BY OTHER DEPARTMENTS**

Title of the discipline requiring approval	Department	Amendments to the curriculum in the academic discipline	Decision of the department, which designed the curriculum (date, protocol #)
1. Histology, cytology, embryology	Human morphology	No changes are added	protocol # 13 of 10.06.2022
2. Topographic anatomy and operative surgery	Human morphology	No changes are added	protocol # 13 of 10.06.2022

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Curriculum content, composition and the accompanying documents comply with the established requirements.

Dean of the Medical Faculty for

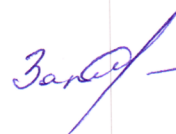
O.S.Ishutin

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26.06.2023

Methodologist of the educational
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