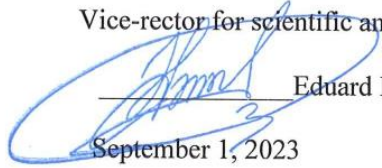


MINISTRY OF HEALTH PROTECTION OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY
Department of Human Anatomy

Approved

APPROVE

Vice-rector for scientific and pedagogical work



Eduard BURYACHKIVSKY

September 1, 2023

**WORKING PROGRAM ON EDUCATIONAL DISCIPLINE
"Human Anatomy"**

Level of higher education: second (master's)

Field of knowledge: 22 "Health care"

Specialty: 226 "Pharmacy, industrial pharmacy"

Educational and professional program: " Pharmacy, industrial pharmacy"

2023

The program is based on the educational-professional program " Pharmacy, industrial pharmacy", the training of specialists of the second (master's) level of higher education in the specialty 226 "Pharmacy, industrial pharmacy" of the field of knowledge 22 "Health care", approved by the Academic Council of ONMedU of ONMedU (protocol No. 8 of 29 June 2023).

Developers:

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The work program was approved at the meeting of the department of normal and pathological clinical anatomy Protocol No. 1 dated August 29, 2023.

Head of the department  Olena APPELHANS

Agreed with the guarantor of EPP  Liana UNGURYAN

Approved by the subject cyclical methodical commission for medical and biological disciplines of ONMedU

Protocol No. 1 dated August 29, 2023.

Head of the subject cyclic methodical commission for medical and biological disciplines

 Leonid GODLEVSKY

Reviewed and approved at the meeting of the department _____

Protocol No. ___ of " ___ " _____ 20__

Head of Department _____

(signature) (First Name Surname)

Reviewed and approved at the meeting of the department _____

Protocol No. ___ of " ___ " _____ 20__

Head of Department _____

(signature) (First Name Surname)

1. Description of the academic discipline

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
Total	Branch of knowledge	Full-time education
	22 "Health care"	Required discipline
Credits of ECNS: 3	Specialty	Year of training 1
	226 "Pharmacy, industrial pharmacy"	Semester I
Hours: 90	Level of higher education	Lectures 10 hours.
	second (master's)	Seminar 0 hours
Content		Practical classes 30 hours
modules: 0		Laboratory classes 0 hours
		Independent work 50 hours.
		including individual tasks 0 hours
		Form of final control: Differentiated scoring

2. The purpose and tasks of the educational discipline, competences, program learning outcomes.

The goal of the educational discipline involves the acquisition by each student of knowledge of anatomy in the world of natural-scientific ideas about the structure and functions of the human body as a whole, the ability to use the acquired knowledge in the further study of other fundamental sciences of medicine, and in the practical activities of a doctor. The purpose of studying human anatomy - *the final goals* are established on the basis of the EPP of training a doctor by specialty in accordance with the block of its content module (natural and scientific training) and is the basis for building the content of the educational discipline. The description of goals is formulated through skills in the form of target tasks (actions). On the basis of the final goals for each module or content module, *specific goals are formulated* in the form of certain skills (actions), target tasks that ensure the achievement of the final goal of studying the discipline.

The final goals of the discipline:

- Analyze information about the structure of the human body, the systems that make it up, organs and tissues;
- Determine the topographical and anatomical relationships of human organs and systems;
- Interpret patterns of prenatal and early postnatal development of human organs, variants of organ variability, malformations;
- Interpret gender, age and individual characteristics of the structure of the human body;
- Predict the interdependence and unity of the structures and functions of human organs, their variability under the influence of environmental factors;
- Determine the influence of social conditions and work on the development and structure of the human body;

- Demonstrate mastery of moral and ethical principles of attitude towards a living person and his body as an object of anatomical and clinical research.

Task. The main tasks of studying the discipline "human anatomy" as a science is a systematic approach to the description of the form, structure of organs, position (topography) of parts and organs of the body in unity with the performed functions, taking into account the age, gender and individual characteristics of a person.

The process of studying the discipline is aimed at forming elements of the following competencies:

Integral competence (IC):

The ability to solve problems of a research and/or innovative nature in the field of pharmacy and to critically consider and solve practical problems in professional pharmaceutical activity using the provisions, theories and methods of fundamental, chemical, technological, biomedical and socio-economic sciences; integrate knowledge and solve complex issues, formulate judgments based on insufficient or limited information; clearly and unambiguously convey one's own knowledge, conclusions and their validity to a professional and non-professional audience. Ability to continue learning with a high degree of autonomy.

General competences (GC) :

GC 01. Ability to think abstractly, analyze and synthesize, learn and be modernly educated.

GC 02. Knowledge and understanding of the subject area and understanding of professional activity.

GC 03. Ability to communicate in the national language both orally and in writing.

GC 05. Ability to evaluate and ensure the quality of the work performed/

GC 10. The ability to act socially responsibly and consciously.

GC 11. Ability to apply knowledge in practical situations.

GC 12. The desire to preserve the environment.

Professional, special competencies (SC):

SC01. Ability to integrate knowledge and solve complex pharmacy problems in broad or multidisciplinary contexts.

SC 04. The ability to clearly and unambiguously convey one's own knowledge, conclusions and arguments in the field of pharmacy to specialists and non-specialists, in particular to people who are studying.

SC 09. Ability to provide pre-medical assistance to the sick and injured in extreme situations and emergencies.

SC10. The ability to monitor the effectiveness and safety of the population's use of medicines according to data on their clinical and pharmaceutical characteristics.

SC21. The ability to ensure the rational use of prescription and non-prescription drugs in accordance with the physicochemical, pharmacological characteristics, biochemical, pathophysiological features of a particular disease and pharmacotherapeutic schemes of its treatment.

SC30. Ability to diagnose emergency conditions.

Program learning outcomes (PLO):

PLO 01. Have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements

PLO 03. Have specialized knowledge and skills/skills for solving professional problems and tasks, including for the purpose of further development of knowledge and procedures in the field of pharmacy.

PLO 09. Formulate, argue, clearly and concretely convey to specialists and non-specialists, including those seeking higher education, information based on one's own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

PLO 12. Provide pre-medical assistance to patients in emergency situations and victims in extreme situations.

PLO 13. Record cases of side effects when using medicinal products of natural and synthetic origin; evaluate factors that can affect the processes of absorption, distribution, deposition, metabolism and excretion of drugs and are determined by the condition and characteristics of the human body and the pharmaceutical characteristics of drugs.

PLO 32. Analyze information obtained as a result of scientific research, summarize, systematize and use it in professional activities.

PLO 33. To determine the influence of factors that affect the processes of absorption, distribution, deposition, metabolism and excretion of the medicinal product and are caused by the condition, characteristics of the human body and the physicochemical properties of medicinal products.

PLO 34. Use the data of clinical, laboratory and instrumental studies to monitor the effectiveness and safety of the use of medicinal products.

PLO 41. To determine the main clinical syndrome or symptom, which determines the severity of the victim's/victim's condition by making a reasoned decision about the person's condition under any circumstances (in the conditions of a health care facility, outside its borders), including in conditions of emergency and hostilities, in field conditions, in conditions of lack of information and limited time.

PLO 43. To organize the required level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.

Know:

a) the form and structure of bodies united in systems:

- shape and structure of bones (systema skeletal);
- connections __ bones (systema articulare);
- muscles (systema musculare);
- entrails (systema digestorium, respiratorium, urinarium, genitalia); ;
- the central one and peripheral nervous system (in ago number of off-line department peripheral nervous systems (systema nervorum);
- bodies internal secretions (glandulae endocrinae);
- organs and structures of the immune system;
- lymphoid system (systema limphoideum);
- sense organs (systema sensuum);
- general cover (integumentum commune);
- cardiovascular (systemacardiovasculare);

b) mutual placement of organs, vessels, nerves in different parts of the body, which is of great importance for surgery;

c) age and gender aspects of anatomical features of individual human development at different stages of ontogenesis;

d) patterns of prenatal and early postnatal development of human organs, variants of organ variability, developmental defects.

Be able:

- demonstrate and describe the anatomical structure of human organs and organ systems;
- determine the topographical-anatomical relationships of human organs and organ systems on anatomical preparations;
- to be able to evaluate age, gender and individual characteristics of the structure of human organs;
- to be able to evaluate the influence of social conditions and work on the development and structure of the human body ;
- be able to use Latin anatomical terms and their Ukrainian equivalents in accordance with the requirements of the international anatomical nomenclature (Sao Paulo, 1997; Kyiv, 2001;

- master the skills of identifying the organs of the human body, parts of the skeleton and bones of the skull on X-rays, CT and MRI scans, to determine the topography of individual bones and formations of the skull and skeleton of a living person, to find the location of the main groups of regional lymph nodes of the head, neck and limbs.

3. Content of the academic discipline

Topic 1. Getting to know the department. Rules of internal procedure. Content of the discipline, types of anatomy. Methods of studying anatomy, clinical significance. Parts, axes, planes of the human body. Acquaintance with age, gender, individual features of the structure of human body organs. The concept of the norm, options, anomalies.

Anatomy of the musculoskeletal system_ Content of the discipline, types of anatomy. Methods of studying anatomy, clinical significance. Parts, axes, planes of the human body. Acquaintance with age, gender, individual features of the structure of human body organs. The concept of the norm, options, anomalies.

Human anatomy is the science of the form and structure, origin and development of the human body, its organs and systems. Anatomy involves a systematic description of the form, structure, condition and topographical relationships of parts and organs of the body, taking into account their age, gender and individual characteristics. The main modern directions of the development of anatomy are age-related anatomy, comparative anatomy, plastic anatomy, anthropology, ecological anatomy, etc.

The main research methods in anatomy are visual research, anthropometric research, dissection, macro-microscopic research, microscopic research. Modern research methods in anatomy: X-ray anatomical methods, computer tomography, magnetic resonance imaging (MRI), ultrasound examination (USD), endoscopy, etc.

Topic 2. Bones of the skeleton. Bone as an organ, bone development, bone classification, bone structure. Arthrosyndesmolgy, review of the connection of bones of the skeleton. Classification of bone connections, biomechanics of joints.

Bones of the skeleton: vertebrae, ribs, sternum. The principle of segmentation of the structure of the axial skeleton. Concise data on phylo- and ontogenesis of the spinal column. General characteristics of the spinal column. General plan of the structure of the vertebrae. Features of the structure of cervical, thoracic, lumbar vertebrae, sacrum, coccyx. Age and sex characteristics of the structure of the vertebrae. The influence of social and environmental factors on the structure of vertebrae. Vertebral malformations. Development of ribs and sternum in phylo- and ontogenesis. Classification of ribs. Structure of ribs and sternum. Forms of variability of ribs and sternum, variants and anomalies of development. Age and sex characteristics of the structure of the sternum. Influence of social and environmental factors on the structure of ribs and sternum.

Bones of the upper limb: divisions. Belt of the upper limb: clavicle, scapula; their structure The free part of the upper limb: humerus, bones of the forearm and hand, sesamoid bones; their structure Timing of ossification of bones of the upper limb. Bones of the lower limb: divisions. Belt of the lower limb: hip bone; its structure Parts of the hip bone, their structure. The free part of the lower limb: femur, leg bones, feet; their structure Timing of ossification of bones of the lower limb. Homology of the bones of the upper and lower limbs. Age and sex characteristics of limb bone structure. Development of connections between bones in phylo- and ontogenesis. Classification of connections between bones. Types of synarthroses: connections using connective tissue (syndesmosis) - membranes, ligaments, seams, parietal bones; connections using cartilaginous tissue (synchondrosis) - permanent, temporary, hyaline, fibrous; connection using bone tissue (synostosis) . Semi-continuous connections - symphysis. Diarthroses (synovial joints, joints): definition, main signs of the joint, their characteristics. Additional components of joints. Classification of joints by structure, shape of articular surfaces, by function. Simple, complex, complex and combined joints: their

characteristics. Types of movements and their analysis (axis of movements, planes of movements). Uniaxial, biaxial and multiaxial joints, their types, characteristics of movements in each type of joint.

Classification of joints of the spinal column. Syndesmoses of the spinal column: their characteristics and structure. Synchrondroses of the spinal column: their characteristics and structure. Joints of the spinal column: median atlanto-axial joint, lateral atlanto-axial joint, arcuate joints, lumbosacral joint, sacrococcygeal joint: their structure. Chest joints: syndesmoses, synchrondroses and joints (costo-vertebral joints, costo- transverse joints, sterno-costal joints): their characteristics and structure. Chest as a whole.

Connection of the upper limb. Connection between the bones of the girdle of the upper limb: syndesmoses of the girdle of the upper limb and joints of the girdle of the upper limb, their structure. Connection between the bones of the free upper limb.

Connection of the lower limb. Joints of the pelvic girdle: syndesmoses, pubic symphysis, sacroiliac joint. The pelvis as a whole: its structure, main dimensions. Age, sex, individual characteristics of the pelvis. Connection between the bones of the free lower limb.

Topic 3. Bones of the skull. The skull of a newborn, individual and sexual features of the skull, criticism of racist theories.

Skull development in phylo- and ontogenesis. Cerebral and facial parts of the skull. The structure of the bones forming the cerebral skull: frontal, occipital, parietal, sphenoid, temporal, ethmoid. The structure of the bones that make up the facial skull: lower jaw, upper jaw, zygomatic, nasal, palatine, lacrimal, hyoid bones, blade, lower nasal concha. Vault of the skull, external and internal bases of the skull. Anterior, middle and posterior cranial fossae, eye socket, bony nasal cavity, temporal, subtemporal, pterygoid-palatine fossae. Age and sex characteristics of the structure of the skull. Variants and anomalies of the development of skull bones. X-ray anatomy. Connection between bones of the skull: classification. Syndesmoses of the skull: seams, their types and characteristics. Synchrondroses of the skull: their types, characteristics, age characteristics. Skull joints: temporomandibular joint and atlanto-occipital joint: their structure. Age-specific features of the skull connection: parietal bones, their types, structure, ossification periods.

Topic 4. Body muscles. Structure, classification, auxiliary apparatus, muscle function. Muscles of the limbs. Structure, classification, auxiliary apparatus, muscle function.

Muscle as an organ - definition. Tendons, aponeuroses. Auxiliary muscles: fascia, synovial sheaths, synovial bags, sesamoid bones, tendon arches, muscle block. Anatomical and physiological muscle diameters: basic data on muscle strength and work; the concept of levers. The beginning and attachment of muscles: their functional characteristics. Muscle classification: according to development, topography, shape, size, direction of muscle fibers, function, etc.

Muscles and fascia of the head: classification. Masticatory muscles, their characteristics. Neck muscles: classification. Superficial, medium and deep muscles of the neck, their characteristics. Neck fascia, topography: anatomical classification. Classification of trunk muscles by topography, development and shape. Segmental structure of trunk muscles. Back muscles: superficial and deep, their characteristics. The thoracolumbar fascia. Muscles and fascia of the chest: superficial and deep, their characteristics.

Muscles and fascia of the abdomen: muscles of the front, side and back walls of the abdomen, their characteristics. White line. Navel ring. Abdominal press Topography of abdominal areas. Inguinal canal. Sheath of the rectus abdominis muscle. Aperture - definition.

Muscles of the upper limb: classification. Muscles of the girdle of the upper limb, their characteristics. Shoulder muscles: classification, their characteristics. Muscles of the forearm: classification, their characteristics. Muscles of the hand: classification, their characteristics. Fascia of the upper limb. Topography of the upper limb Muscles of the lower limb: classification. Muscles of the girdle of the lower limb: classification, their characteristics.

Muscles of the thigh: classification, their characteristic. Leg muscles: classification, their characteristic. Foot muscles: classification, their characteristics. Fasciae and topography of the lower limb.

Age, gender and individual characteristics of skeletal muscles. The influence of sports, work, social factors and environmental factors on the structure of skeletal muscles.

Topic 5. The Digestive System. Organs of the oral cavity. Pharynx. Esophagus, stomach, intestines, liver, pancreas. Peritoneum.

Classification of internal organs: tubular and parenchymatous. General plan of the structure of the wall of tubular organs: mucous membrane, muscle membrane, outer membrane.

Characteristics of each shell. Organ-specific features of the structure of the mucous membrane depending on the function of the organ. Serous membrane: options for the relationship of organs to the peritoneum. General regularities of the structure of parenchymal organs. Glands: their classification, general principles of structure, functions.

Digestive system: organs, functions. Development of the oral cavity and its derivatives. Development of organs of the alimentary canal. Development of the liver and pancreas. Primary and secondary body cavities. Sources of development of serous membranes. Development of peritoneum. Structural mechanisms of malformations of the oral cavity and its derivatives. Anomalies and variants of the development of organs of the alimentary canal, liver, pancreas .

Oral cavity: its parts. The walls of the mouth cavity and the oral cavity itself, their connection. Teeth Parts of the tooth. Crown surfaces. General structure of teeth. Periodont, periodontium. Gums. Permanent teeth: their formula, characteristics of each type of teeth. Timing of eruption of permanent teeth. Milk teeth: formula, features of the structure, timing of eruption. Palate: hard palate, soft palate, their structure. Tonsils Language: parts. Features of the structure of the mucous membrane, tongue muscles. Oral glands: classification, their development.

Pharynx, its topography, parts, connections. Ziv, its limits. Lymphatic (lymphoid) ring of the pharynx. The structure of the pharynx wall .

Esophagus: topography, parts, wall structure. Narrowing of the esophagus. X-ray anatomy of the esophagus. Stomach: topography, parts of the stomach. The structure of the stomach wall: peculiarities of the structure of the mucous membrane (relief, glands), muscular membrane and serous membrane. Small intestine, its divisions. Duodenum: parts, topography, variants of its shape and position. X-ray anatomy of the duodenum. Topography of the mesenteric part of the small intestine: jejunum and ileum. The structure of the wall of the small intestine. Colon: departments. The structure of the colon wall: mucous membrane (glands, folds, lymphatic (lymphoid) nodules), muscle membrane, serous membrane. Relationship to the peritoneum of each section of the large intestine. Macroscopic changes in the structure of the small and large intestine. Age-related features of the colon structure.

Liver. Topography. External structure: edges, surfaces and their relief. Ligaments of the liver. Relation to peritoneum. The internal structure of the liver: lobes, segments, lobules. Liver vessels. Liver functions. Pathways of bile secretion. Gallbladder: topography, parts, wall structure, functions. Pancreas: parts, topography, structure, functions. Pancreatic ducts. Pancreatic islets.

Peritoneum. Abdominal cavity, its contents. Peritoneal cavity , its contents. Peritoneal peritoneum, visceral peritoneum: their characteristics. Variants of the relation of internal organs to the peritoneum. Peritoneal derivatives: mesenteries, caps, ligaments, their structure and functions. Derivatives of the peritoneal cavity: bags (hepatic, pregastric, capsular - their walls, connections), sinuses, canals, nooks and crannies.

Topic 6. Respiratory system. Pleura.

Respiratory system: organs, functions. Upper and lower respiratory tract. Development of organs of the respiratory system in phylo- and ontogenesis. Variants and abnormalities of the development of organs of the respiratory system.

External nose: parts, structure. Nasal cavity: parenchyma, nasal passages, paranasal sinuses. Functional parts of the nasal cavity. Nasal part of the pharynx. Larynx. Topography. The structure of the larynx: cartilage, ligaments, joints, muscles. The cavity of the larynx: parts, their boundaries. Vocal folds, hair folds. Glottis. Voice formation mechanisms. Trachea: parts, topography, wall structure. Main bronchi: topography, wall structure. Bronchial tree. Age characteristics.

Lungs: topography, external structure. Gate of the lungs. The root of the lungs and its components. Parts, segments, lobules of the lung. Acinus. Pulmonary circulatory system. X-ray anatomy of the trachea, bronchi, lungs. Age-related features of the lungs. Pleura. Mediastinum: definition, boundaries. Organs of the anterior and posterior mediastinum.

Topic 7. Heart, interstitium, pericardial sac. Heart vessels and nerves. Large and small circle of blood circulation.

Topography of the heart. Shape, position of the heart. External structure of the heart. Chambers of the heart: their structure. Heart valves. The structure of the heart wall: endocardium, myocardium, epicardium. Conductive system of the heart. Arteries and veins of the heart. Heart, its structure, heart cavity, contents, sinuses. Projection of the borders of the heart and valves on the front wall of the chest. Age anatomy of the heart. Large circle and small circle of blood circulation. Fetal circulation.

Development of the heart in phylogeny. Stages of heart development in human embryogenesis. Variants and anomalies of heart development. Structural mechanisms of the development of heart abnormalities.

Topic 8. Urinary system. Male genital system. Female genital system.

Urinary system: organs, functions. Development of organs of the urinary system in phylo- and ontogenesis. Variants and abnormalities of the development of organs of the urinary system: kidneys, ureters, bladder and urethra.

Kidney: topography of the right and left kidney. External structure. Relationship of the kidney to the peritoneum. Kidney shells. Fixing apparatus of the kidney. Topography of renal peduncle elements. Internal structure of the kidney. Nephron. The structure of the circulatory system of the kidney. Urethra: parts, topography, wall structure, function. Narrowing of the ureter.

Urinary bladder: shape, external structure, parts. Features of topography in men and women. The structure of the bladder wall.

Male reproductive system: organs, functions. Internal male genitalia. External male genitalia. Development of organs of the male reproductive system in phylo- and ontogenesis. Variants and anomalies of the development of internal male genital organs. Hermaphroditism. Internal male genitalia. Testis: topography, structure. Hope The process of descent of the testicle. Testicular membranes. Ejaculatory duct: parts, its topography, wall structure. The spermatic cord, its components. Seminal vesicle. Ejaculatory duct. Prostate gland. Bulbous-urethral gland. External male genitalia. The gate The penis, its structure. Male urethra: parts, their topography, wall structure.

Female reproductive system: organs, functions. Classification of organs of the female reproductive system. Internal female genital organs. External female genitalia. Ovary: topography, external structure, internal structure, ligaments of the ovary, relation to the peritoneum, functions. Cyclic changes in the structure of the ovary. Age characteristics. Uterine tube. Uterus. Vagina. X-ray anatomy of internal female genital organs. External female genitalia. Female urethra. Perineum: definition, topography. Urogenital diaphragm: boundaries, muscles, fascia, sexual withdrawal. Pelvic diaphragm.

Topic 9. Organs of the endocrine system, organs and elements of the immune system.

Immune system: functions. Classification of organs of the immune (lymphatic or lymphoid) system by function. Central organs of the immune system (primary lymphatic or

lymphoid organs): bone marrow, retrosternal gland (thymus) - structural regularities of their functions.

Peripheral organs of the immune system (secondary lymphatic or lymphoid organs): structural regularities of their functions.

Central organs of the immune system (primary lymphatic or lymphoid organs). Red bone marrow. Yellow bone marrow. Topography, structure, functions. Age-related features of bone marrow. The retrosternal gland (thymus).

Peripheral organs of the immune system (secondary lymphatic or lymphoid organs). Spleen. Lymphatic (lymphoid) ring of the pharynx: tonsils forming it Lymph nodes. Single lymphatic (lymphoid) nodes: clustered lymphatic (lymphoid) nodes: topography, structure, functions. Accumulated lymphatic (lymphoid) nodules of the appendix: topography, structure, functions.

General principles of the structure of endocrine organs. Structural definition of the concept of "endocrine function". Structural mechanisms of hormone action. Classification of endocrine organs.

Thyroid gland: topography, structure, functions. Parathyroid gland: topography, structure, functions. Adrenal gland: structure, functions. Topography of the right and left adrenal glands. Endocrine part of the pancreas: structure, functions. Pituitary gland: topography, parts, structure, functions. Pineal gland: topography, structure, functions.

Topic 10. Central nervous system. Brain and spinal cord.

The leading role of the nervous system in the body; its importance for the integration of organs, organ systems into a single whole organism, in establishing the relationship of the organism with the external environment. Classification of the nervous system according to the topographical principle (on the central nervous system and peripheral nervous system) and on the anatomical and functional principle (on the somatic nervous system and the autonomic nervous system). The general principle of the structure of a neuron. Morphological and functional classification of neurons. Receptors, their classification. General plan of the structure of synapses. Reflex arcs. Gray matter of the central nervous system. Neuroglia. Principles of spatial organization of gray matter of the central nervous system. Nerve nodes. White matter of the central nervous system.

Stages of development of the nervous system in phylogeny. Development of the nervous system in ontogenesis. Development of the spinal cord in embryogenesis. Development of the brain in embryogenesis: the stage of three and five brain vesicles and their derivatives. Anomalies of the development of the spinal cord and brain.

Topography of the spinal cord, its borders. External structure of the spinal cord. The ratio between vertebrae and segments of the spinal cord (Shipo's rule). Internal structure of the spinal cord: central canal, gray and white matter. The structure of the posterior, lateral and anterior horns of the spinal cord. White matter: classification. The composition of the anterior, lateral and posterior cords of the spinal cord.

Brain. Departments of the brain: cerebrum, cerebellum, brain stem. Classification of brain departments according to development. Derivatives of the rhomboid brain: medulla oblongata and hindbrain (pons and cerebellum).

Oblong brain: boundaries, external structure. Internal structure: gray and white matter. Bridge: external structure. Internal structure: gray and white matter. Cerebellum: topography, external structure. Internal structure. Structure of the legs of the cerebellum.

Rhomboid fossa: formation, boundaries, relief. Projection of cranial nerve nuclei on the surface of the rhomboid fossa. The fourth ventricle: walls, connections.

Midbrain, its parts. Roof plate: external structure; internal structure: gray and white matter. Legs of the brain, internal structure. Brain plumbing.

Derivatives of the forebrain: intermediate brain, terminal brain.

Midbrain: parts (dorsal - thalamic brain; ventral part - hypothalamus). Parts of the thalamic brain: thalamus, epithalamus, metathalamus.

Cerebrum: hemispheres of the cerebrum. Corpus callosum, vault, anterior commissure. Olfactory brain: parts, their components. Basal nuclei: topography, parts, functions. Cloak. Cerebral cortex: cyto- and myeloarchitectonics of the cortex. The works of V. O. Betz. The relief of the cerebral hemispheres: furrows and convolutions. Morphological bases of dynamic localization of functions in the cortex of the cerebral hemispheres. White matter of the hemispheres: classification. Associative fibers: classification, functions. Commissural fibers, their functions. Projection fibers: classification. Internal capsule: parts, topography of the leading paths in each part. Lateral ventricles: parts, their topography, walls, connections. Conductive ways - definition. Spinal cord sheaths. Intermembrane spaces and their contents. Meninges.

Topic 11. Sense organs.

Anatomical and functional characteristics of sense organs. Peripheral perceived, conductors and cortical centers of analyzers, their functional unity. The organ of smell. The olfactory part of the nasal mucosa. Conductive pathways of the olfactory analyzer. The organ of taste. Taste buds of the tongue, their topography. The leading paths of the taste analyzer. General cover. Skin: functions. Types of skin sensitivity. Mammary gland.

Eyeball. Shells of the eyeball: fibrous, vascular, internal (retina) - their structure. Cameras of the eyeball: front, back, their walls. Vitreous body, lens. Watery moisture: place of formation, ways of outflow. Accommodation apparatus of the eye. Additional structures of the eye.

Ear. Phylo- and ontogenesis. Parts of the ear: outer, middle and inner ear. External ear: parts, their structure. Middle ear: parts. Drum cavity: walls, contents. Connection of the tympanic cavity. Auditory tube: parts, structure. Inner ear, parts, topography. Bony labyrinth: prinos, semicircular canals, gyrus, their structure. Membranous labyrinth: pricine labyrinth, semicircular ducts, convoluted duct, their structure. Mechanism of perception and ways of conducting sound. Conductive ways of hearing and balance.

Topic 12. Cranial nerves. Vessels of the head and neck.

General characteristics of cranial nerves. Common features and differences in the structure of cranial and spinal nerves. Classification of cranial nerves by function (motor, sensitive, mixed). Classification of cranial nerves by origin. Development of cranial nerves in connection with sense organs (I, II, VIII pairs), myotomes of main somites (III, IV, VI, XII pairs), with gill arches (V, VII, IX, X, XI pairs). Differences in the structure of cranial nerves derived from the brain (I, II pairs) from the rest of the cranial nerves. General plan of the structure of motor, sensory and mixed cranial nerves. General plan of the structure of vegetative nodes of the head: roots and branches.

Anatomy of cranial nerves: nuclei, their localization, exit of the nerve from the brain, from the skull, branches of nerves, composition of their fibers, topography, areas of innervation. Vegetative nodes of the head (pterygoid, ciliary, submandibular, hyoid, ear): their roots and branches, areas of innervation.

Repeat the structure of the head and neck organs, study their blood supply and innervation.

Internal jugular vein: formation, topography, classification of tributaries. Intracranial tributaries, extracranial tributaries of the internal jugular vein. Anastomoses between intracranial and extracranial tributaries of the internal jugular vein. External jugular vein: formation, topography, tributaries. Anterior jugular vein: formation, topography, tributaries. Jugular venous arch: topography, formation.

Topic 13. Nerves of the thoracic, abdominal, pelvic cavities and their walls. Vessels of the thoracic, abdominal, and pelvic cavities and their walls.

Anatomical classification of arteries (pericardial, main, extra-organ, intra-organ). Classification of arteries according to wall structure. Types of arterial branching. The main regularities of the distribution of arteries in the human body. Arterial intersystemic and

intrasystemic anastomoses. Sources and mechanisms of development of arteries. Arterial arches and their derivatives. Variants and abnormalities of the development of main arteries.

Vessels of the hemomicrocirculatory channel, the structure of their walls and functions. Sources and mechanisms of blood vessel formation in the hemomicrocirculatory bed. Organ specificity of blood vessels of the hemomicrocirculatory channel. The concept of ways of collateral (bypass) blood flow. Age-related features of arteries.

Aorta, its parts. Thoracic aorta: topography, classification of branches. Branches of the thoracic aorta and areas of their blood supply. Internal thoracic artery (branch of the subclavian artery): topography, branches, areas of blood supply. Intrasystemic and intersystemic arterial anastomoses.

Abdominal aorta: topography, classification of branches. Partral branches of the abdominal aorta: topography, areas of blood supply. Visceral branches of the abdominal aorta: even and odd. Even and odd visceral branches of the abdominal aorta: topography and areas of blood supply. Common iliac artery: formation, topography, branches. Internal iliac artery: topography, classification of branches. Partral and visceral branches of the internal iliac artery: topography, areas of blood supply, intrasystemic and intersystemic arterial anastomoses.

Anatomical classification of veins (pericardial, main, extra-organ, intra-organ). Classification of veins according to the structure of the wall. Roots and tributaries of veins. Superficial veins, deep veins. Venous networks, venous plexuses. Superior vena cava: roots, tributaries, topography. Odd vein: formation, topography, classification of tributaries, areas of venous blood collection. Hemipair vein: formation, topography, classification of tributaries, areas of venous blood collection. Spinal veins . Inferior vena cava: roots, topography, classification of tributaries. Partral and visceral tributaries of the inferior vena cava, areas of venous blood collection.

Portal hepatic vein: roots, topography, tributaries. Superior mesenteric vein: topography, tributaries, areas of venous blood collection. Inferior mesenteric vein: topography, tributaries, areas of venous blood collection. Splenic vein: topography, tributaries, areas of venous blood collection.

Venous intrasystemic anastomoses. Venous intersystemic anastomoses: cava-caval, porto-caval anastomoses and porto-caval-caval anastomoses.

Classification of lymphatic vessels. Lymphatic capillaries: wall structure and functions. Lymphatic postcapillaries: wall structure and functions. Lymphatic vessels (intraorgan and extraorgan): wall structure and functions. Superficial and deep lymphatic vessels. Lymphatic trunks: jugular, subclavian, broncho-mediastinal, lumbar, intestinal - their formation, topography, functions. Lymphatic ducts: thoracic duct, right lymphatic duct.

Thoracic duct: roots, topography, tributaries, place of confluence with the venous system. The right lymphatic duct: roots, topography, place of confluence with the venous system.

Repeat the structure of the walls and organs of the chest cavity, study their blood supply and innervation. Repeat the structure of the walls and organs of the abdominal cavity, study their blood supply and innervation. Repeat the structure of the walls and organs of the pelvic cavity, study their blood supply and innervation.

Topic 14. Vessels and nerves of the upper limb. Vessels and nerves of the lower limb.

Components of the peripheral nervous system: nerves, nerve nodes, nerve plexuses, nerve endings. General plan of the structure of the nerve. Vascular-nerve bundles. Classification of nerves. Segmental distribution of peripheral nerves. Nerve nodes: classification. General plan of the structure of sensitive nodes. Spinal nerve: formation, composition fibers, branches; correspondence to segments of the spinal cord, system. Cervical plexus: sources of formation, topography, branches, areas of innervation.

Brachial plexus: sources of formation, topography. Trunks of the brachial plexus. Classification of branches.

Axillary artery: departments, branches. Brachial artery, ulnar and radial arteries: branches, regions of blood supply. Arterial arches of the hand: superficial and deep palm.

The main shoulder vein: formation (roots), topography, tributaries. Superior vena cava: formation (roots), topography, tributaries. Veins of the upper limb: superficial and deep.

Lumbar plexus: sources of formation, topography, branches, areas of innervation. Sacral plexus: sources of formation, topography, classification of branches. Short and long branches of the sacral plexus: Coccygeal plexus: sources of formation, topography, branches, areas of innervation. External iliac artery, femoral artery, lower leg and foot arteries: branches, regions of blood supply. Veins of the lower limb: superficial and deep.

Differentiated scoring.

4. The structure of the academic discipline

Names of topics	Number of hours			
	That's all	including		
		1	p/s	SRZ
1	2	3	4	5
Topic 1. Getting to know the department. Rules of internal procedure. Content of the discipline, types of anatomy. Methods of studying anatomy, clinical significance. Parts, axes, planes of the human body. Acquaintance with age, gender, individual features of the structure of human body organs. The concept of the norm, options, anomalies.	7	2	2	3
Topic 2. Bones of the skeleton. Bone as an organ, bone development, bone classification, bone structure. Arthrosyndesmology, review of the connection of bones of the skeleton. Classification of bone connections, biomechanics of joints.	5		2	3
Topic 3. Bones of the skull. The skull of a newborn, individual and sexual features of the skull, criticism of racist theories.	7	2	2	3
Topic 4. Body muscles. Structure, classification, auxiliary apparatus, muscle function. Muscles of the limbs. Structure, classification, auxiliary apparatus, muscle function.	5		2	3
Topic 5. Digestive system. Organs of the oral cavity. Pharynx. Esophagus, stomach, intestines, liver, pancreas. Peritoneum.	5		2	3
Topic 6. Respiratory system. Pleura.	5		2	3
Topic 7. Heart, core, heart. Heart vessels and nerves. Large and small circle of blood circulation.	7	2	2	3
Topic 8. Urinary system. Male genital system. Female genital system.	7	2	2	3
Topic 9. Organs of the endocrine system, organs and elements of the immune system.	5		2	3
Topic 10. Central nervous system. Brain	7	2	2	3

and spinal cord.				
Topic 11. Sense organs.	5		2	3
Topic 12. Cranial nerves. Vessels of the head and neck.	5		2	3
Topic 13. Nerves of the thoracic, abdominal, and pelvic cavities and their walls. Vessels of the thoracic, abdominal, and pelvic cavities and their walls.	5		2	3
Topic 14. Vessels and nerves of the upper limb. Vessels and nerves of the lower limb.	5		2	3
Differentiated scoring	10		2	8
Individual tasks	0			
Total hours	90	10	30	50

5. Topics of lectures / seminars / practical / laboratory classes

5.1. Topics of lectures

	Topic	Number of hours
1.	Introductory lecture. The history of the development of anatomy. Research methods . Nomenclature. General and frequent osteology.	2
2.	Arthrosyndesmology. General myology. Muscles trunk and limbs. Splanchnology. The doctrine of the entrails. The Digestive System.	2
3.	Vascular system. Arterial system. Venous system. Lymphatic system. Heart.	2
4.	Urinary and reproductive systems (female and male). Peritoneum. Endocrine system. Immune system.	2
5.	General information about the nervous system. central nervous system Esthesiology. Peripheral nervous system. Autonomic nervous system	2
	Total hours per course	10

5.2. Topics of seminar classes

Seminar classes are not provided.

5.3. Topics of practical classes

No	TOPIC OF THE LESSON	Number of hours
1	Getting to know the department. Rules of internal procedure. Content of the discipline, types of anatomy. Methods of studying anatomy, clinical significance. Parts, axes, planes of the human body. Acquaintance with age, gender, individual features of the structure of human body organs. The concept of the norm, options, anomalies.	2

2	Bones of the skeleton. Bone as an organ, bone development, bone classification, bone structure. Arthrosyndesmology, review of the connection of bones of the skeleton. Classification of bone connections, biomechanics of joints.	2
3	Bones of the skull. The skull of a newborn, individual and sexual features of the skull, criticism of racist theories.	2
4	Body muscles. Structure, classification, auxiliary apparatus, muscle function. Muscles of the limbs. Structure, classification, auxiliary apparatus, muscle function.	2
5	The Digestive System. Organs of the oral cavity. Pharynx. Esophagus, stomach, intestines, liver, pancreas. Peritoneum.	2
6	Respiratory system. Pleura.	2
7	Heart, interstitium, pericardial sac. Heart vessels and nerves. Large and small circle of blood circulation.	2
8	Urinary system. Peritoneum. Male genital system. Female genital system.	2
9	Organs of the endocrine system, organs and elements of the immune system.	2
10	Central nervous system. Brain and spinal cord.	2
11	Sense organs.	2
12	Cranial nerves. Vessels of the head and neck.	2
13	Nerves of the thoracic, abdominal, pelvic cavities and their walls. Vessels of the thoracic, abdominal, and pelvic cavities and their walls.	2
14	Vessels and nerves of the upper limb. Vessels and nerves of the lower limb.	2
15	Differentiated scoring	2
Total hours		30

5.4. Laboratory topics classes

Laboratory classes are not provided .

6. Independent work

No	TOPIC OF THE LESSON	Number of hours
1.	Preparation for practical class №1	3
2.	Preparation for practical class №2	3
3.	Preparation for practical class №3	3
4.	Preparation for practical lesson №. 4	3
5.	Preparation for practical lesson №. 5	3
6.	Preparation for practical lesson №. 6	3
7.	Preparation for practical lesson №. 7	4
8.	Preparation for practical lesson №. 8	3
9.	Preparation for practical lesson №. 9	3
10.	Preparation for practical class №10	4
11.	Preparation for practical class №11	3
12.	Preparation for practical lesson №. 12	3
13.	Preparation for practical class №13	3
14.	Preparation for practical lesson №. 14	3
15.	Preparation for differentiated assessment	6
Total hours		50

7. Teaching methods

Lectures . The topics of the lecture course reveal the problematic issues of the relevant sections of human anatomy.

Practical classes include : a conversation, practicing the skills of examining and describing an anatomical preparation, instruction and practicing skills on the virtual anatomical table "A natomage Table ", solving clinical problems, testing.

Independent work: independent work with the textbook, independent work with the bank of test tasks Step-1, independent solution of situational tasks.

8. Forms of control and assessment methods (including criteria for evaluating learning outcomes)

Current control: oral survey, testing, assessment of performance of practical skills, solution of situational tasks, assessment of activity in class.

Final control : differentiated assessment

Evaluation of the current educational activity in a practical lesson :

The structure of the current evaluation in the practical lesson :

1. Evaluation of theoretical knowledge on the subject of the lesson:
 - methods: survey, solving a situational problem;
 - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2 .
2. Evaluation of practical skills and manipulations on the subject of the lesson:
 - methods: assessment of the correctness of the performance of practical skills
 - maximum score – 5, minimum score – 3, unsatisfactory score – 2 ;

The grade for one practical session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Current assessment criteria for practical training:

Rating	Evaluation criteria
Excellent "5"	The applicant is fluent in the material, actively participates in the discussion and solving of tests, situational clinical problems, confidently demonstrates practical skills during the examination and description of the anatomical preparation. Expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
Fine "4"	The applicant has a good command of the material, participates in the discussion and solution of the situational clinical problem, tests, demonstrates practical skills during the examination and description of the anatomical preparation with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactory "3"	The applicant does not have sufficient knowledge of the material, takes part in the discussion and solution of the situational clinical problem without confidence, demonstrates practical skills during the examination and description of the anatomical preparation with significant errors.
Unsatisfactorily "2"	The applicant does not possess the material, does not take part in the discussion and solution of the situational clinical problem, does not answer the tests, does not demonstrate practical skills during the examination and description of the anatomical apparatus.

Only those applicants who have fulfilled the requirements of the training program in the discipline, have no academic debt and their average score for the current educational activity in the discipline is at least 3.00 are admitted to the final control in the form of a differentiated credit.

Criteria for evaluating the results of the students' training during the final control - differentiated assessment:

The content of the evaluated activity	Scores
Overview and description of the anatomical preparation of UDRS	1
Answer to 4 (four) theoretical questions.	4

Criteria for evaluating the results of the students' studies on the differentiated test:

Rating	Evaluation criteria
Perfectly "5"	It is presented to the applicant who worked systematically during the semester, showed during the exam versatile and in-depth knowledge of the program material, is able to successfully perform the tasks provided for by the program, mastered the content of the main and additional literature, realized the relationship between individual sections of the discipline, their importance for the future profession, showed creative abilities in understanding and using the educational program material, showed the ability to independently update and replenish knowledge; the level of competence is high (creative);
Fine "4"	It is awarded to the applicant who has demonstrated complete knowledge of the curriculum material, successfully completes the tasks provided for by the program, mastered the basic literature recommended by the program, has shown a sufficient level of knowledge in the discipline and is capable of their independent updating and renewal in the course of further education and professional activity; the level of competence is sufficient (constructive and variable)
Satisfactorily "3"	It is issued to the applicant who has demonstrated knowledge of the basic curriculum material in the amount necessary for further education and subsequent work in the profession, copes with the tasks provided for in the program, made some mistakes in the answers on the exam and when completing the exam tasks, but has the necessary knowledge for overcoming mistakes made under the guidance of a scientific and pedagogical worker; level of competence - average (reproductive)
Unsatisfactorily "2"	It is presented to the applicant who did not demonstrate sufficient knowledge of the main educational program material, made fundamental mistakes in the performance of the tasks provided for by the program, cannot use the knowledge in further studies without the help of a teacher, did not manage to master the skills of independent work; the level of competence is low (receptive-productive)

9. Distribution of points received by students of higher education

The grade for the discipline consists of 50.0% of the grade for current academic performance and 50.0% of the grade for differential credit.

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

Conversion table of a traditional assessment into a multi-point scale

Traditional four-point scale	Multipoint 200-point scale
Excellent ("5")	185 - 200
Good ("4")	151 - 184
Satisfactory ("3")	120-150
Unsatisfactory ("2")	Below 120

Multi-point scale (200-point scale) characterizes the actual success of each applicant in mastering the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is given to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study in one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale

Evaluation on the ECTS scale	Statistical indicator
AND	Top 10% achievers
IN	The next 25% of earners
WITH	The next 30% of earners
D	The next 25% of earners
IS	The next 10% of earners

10. Methodological support

- Working program of the academic discipline
- Syllabus of the academic discipline
- Situational tasks for the license exam "Step-1"
- Methodical developments for practical classes
- Electronic bank of test tasks by subdivisions of the discipline.

Educational and methodical literature:

- Self-study workbook on the discipline "Human anatomy" part I. Educational edition. Under the general editorship of Dr. M.Sc. Professor O.L. Appelhans. Odesa, 2021. 136 p.

- Self-study workbook on the discipline "Human anatomy" part II. Educational edition. Under the general editorship of Doctor of Medicine, Professor O.L. Appelhans. Odesa, 2021. 120 p.

- Self-study workbook on the discipline "Human anatomy" part III. Educational edition. Under the general editorship of Doctor of Medicine, Professor O.L. Appelhans. Odesa, 2021. 104 p

11. Questions for preparing for the final inspection

1. Anatomy in the Renaissance and Middle Ages. Leonardo da Vinci, A. Vesalius, G. Fallopius, B. Eustachy. The first Ukrainian doctors of medicine - George Drohobych, Pylyp Lyashkovskiy.
2. The spine as a whole. Connection between vertebrae. Muscles that provide movement. X-ray anatomy.
3. Cerebral skull. The bones that form it. Features of their development, age features. The skull of a newborn.
- 4 Facial skull. The bones that form it. Individual, gender and age characteristics. Eye socket, connections, walls, contents. Blood vessels and nerves. Temporal, subtemporal and pterygopalatine fossa, their walls, contents.

5. Hip bones and their connections. Age and gender characteristics. The pelvis as a whole. The dimensions of the female pelvis. Hip joint. X-ray anatomy.
6. Bones of the lower leg and foot, their connection, X-ray image.
7. Classification of bone connections. Continuous connections. The structure of the joint. Temporomandibular joint. Form, structure, muscles acting on it. Blood supply, innervation. X-ray anatomy.
8. Connection of the bones of the upper limb. Shoulder and elbow joints. Muscles acting on them, their blood supply, innervation. X-ray anatomy.
9. Knee joint, structure, movements, shape, X-ray anatomy. Muscles acting on it, their innervation and blood supply.
10. General anatomy of muscles. Classification, structure of muscle as an organ. Development of skeletal muscles. Back muscles. Topographic and embryological classification. Superficial and deep muscles of the back and their innervation, blood supply.
11. Neck muscles and fascia, classification. Superficial and deep muscles of the neck, the middle group of muscles (supra- and hypohyoid muscles), their innervation, blood supply,
12. Masticatory and facial muscles, their development, functions, innervation and blood supply.
13. Anatomy of abdominal and chest muscles. Diaphragm. Innervation, blood supply. Sheath of the rectus abdominis muscle. White belly line, umbilical ring. Inguinal canal, walls, deep and superficial ring, contents.
14. Muscles of the shoulder girdle, shoulder and forearm, their group characteristics, innervation, blood supply.
15. Muscles and fascia of the thigh and lower leg. Classification, topography, innervation, blood supply. Muscular and vascular lacunae. Drive (Gunter's) channel.
16. Development of the gastrointestinal tract. General diagram of the structure of the digestive tube. Characteristics of wall shells. cavity. Walls. Palate. Teeth Parts of the tooth. Dental formula. Timing of eruption of permanent teeth. Salivary glands. Tongue.
17. Pharynx. parts Topography. Building Pirogov-Valdeyer's lymphoepithelial ring. Innervation, blood supply of the throat.
18. Esophagus. Stomach: development, parts, topography, structure, relation to the peritoneum, ligaments, innervation, blood supply.
19. Small intestine: sections, their topography, wall structure, relation to the peritoneum, innervation, blood supply. Large intestine: sections, their topography, peritoneum relationship, wall structure, innervation, blood supply.
20. Liver: development, structure, topography. Gallbladder . Excretory ducts of the liver and gall bladder. Innervation, blood supply. Pancreas: development, topography, structure. Excretory ducts. Endocrine part of the gland. Innervation, blood supply.
21. Peritoneum. General characteristics. Leaves, caps, pockets, ties, ripples.
22. Neurogenic endocrine glands: pituitary gland, pineal body. Their development, topography, structure, innervation, blood supply. Bronchiogenic glands of internal secretion: thyroid, parathyroid, thymus, their development, structure, topography. Innervation, blood supply.
23. External nose. Nasal cavity, its walls, departments. Sacrificial sinuses.
24. Larynx: cartilages, their connections, muscles, their function. The cavity of the larynx. Innervation, blood supply of the larynx. Trachea, bronchi.
25. Lungs: development, topography, structure, innervation, blood supply. Mediastinum: boundaries, divisions. Organs of the lower mediastinum. Projection of the borders of the heart and its openings on the front chest wall.
26. Kidneys: development, topography, structure, innervation, blood supply. Ureters, bladder, urethra. Topography, structure, function.
27. Uterus, fallopian tube, ovaries: development, parts, topography, structure, relation to the peritoneum. Innervation, blood supply. External female genitalia. Breast.
28. Internal and external male genitalia: structure, topography, function. The process of descent of the testicle into the portal vein. Abnormalities of the position of the testicle. Seed cord. Perineum.
29. General anatomy of blood vessels. Main, extra-organ and internal organs vessels Microcirculatory channel. A large circle of blood circulation. Functional characteristics of the links

of the great circle of blood circulation. A small circle of blood circulation. The value of V. Harvey in the discovery of the great circle of blood circulation.

30. Heart: development, wall structure, conduction system. Chambers, valves. Blood vessels of the heart. Types of blood supply to the heart.

31. Aorta, its parts and topography. Aortic arch. The thoracic and abdominal part of the aorta and their branches. External and internal carotid arteries, topography, branching areas. Subclavian artery, topography, branches. Areas of their branching. Blood supply of the brain and spinal cord. Superior vena cava, inferior vena cava, portal hepatic vein: roots of tributaries..

31. Arteries and veins of the upper limb.

32. Arteries and veins of the lower limb.

33. Development of the central nervous system (brain bubbles and their derivatives). Types of nervous system in invertebrates and vertebrates. Spinal cord. Topography of white and gray matter. Oblong brain. Midbrain, structure, functional significance. Rhomboid fossa, its boundaries, relief, projection of cranial nerve nuclei. IV ventricle, its walls and connections. Bridge. Cerebellum. Building Legs of the cerebellum. Brain stem. parts Characteristics of the nuclei of the cranial nerves of the brainstem. Intermediate brain. parts Building III ventricle. Hypothalamic area, departments, connection with the pituitary gland.

34. End brain. The relief of the upper lateral surface of the cerebral hemispheres . Localization of analyzer cores on. the upper lateral surface of the terminal brain. Research by V. O. Betz. . The relief of the medial surface of the cerebral hemispheres. Localization of analyzer cores. . Conductive ways. Proprioceptive pathways of the cortical and cerebellar direction. Exteroceptive ways.

Olfactory brain. And a pair of cranial nerves. Conductive pathways of the olfactory analyzer. Lateral ventricles of the brain. Parts, their position. Vascular plexus, connection with the III ventricle. Meninges . . Basal nuclei of cerebral hemispheres. Descending pathways. Classification. Cerebrospinal (pyramidal) pathways. Extrapyramidal system, function, centers. Conductive pathways of the extrapyramidal system.

35. Anatomy of the organ of hearing and balance, Structure of the outer, middle and inner ear: walls of the tympanic cavity, holes, auditory ossicles, auditory tube, labyrinths. VIII pair of cranial nerves.

36. Organ of vision. Eyeball (shells, core). Mechanism of accommodation. Retina. Conductive paths of the visual analyzer. Auxiliary apparatus of the eye. II pair of cranial nerves.

37. Spinal nerve and its branches. The formation of gossip.

Cervical plexus. Formation, topography, areas of innervation

38. Brachial plexus, topography, branches, areas of innervation.

39. Lumbar plexus, formation, topography, branches, areas of innervation. Sacral plexus, formation, topography, branches.

40. Autonomic nervous system. Sympathetic and parasympathetic departments.

12. Recommended literature

The main one

1. Human anatomy: a textbook /V.R. Cherkasov, S.Y. Kravchuk. Vinnytsia: New book, 2020. 656 p.
2. Atlas of human anatomy: 7th edition / Frank G. Netter (bilingual) [science. ed. trans.from English L.R. Mateusz-Watseba, others]. All-Ukrainian. Special "Medytsina"publishing house, 2020. 736 p.
3. Sobotta. Atlas of human anatomy. In 2 volumes. Processing and editing of the Ukrainian edition: V.G. Cherkasov, trans. O.I. Kovalchuk. Kyiv: Ukrainian Medical Bulletin, 2019.

Additional

1. Human anatomy: a textbook in three volumes / edited by prof. V.G. Kovechnikov. Lugansk 2011.
2. Gray's Anatomy/H. V. Carter Henry Gray/ Barnes & Noble, 2018. 1280 p.
3. Test tasks "Step-1" - human anatomy / 5th edition, revised / Edited by V.G. Cherkasova, I.V. Dzevulska I.V., O.I. Kovalchuk Tutorial. 2016. 100 p.

4. Human anatomy. V.G. Cherkasov, S.Yu. Kravchuk – Vinnytsia: Nova kniga, 2015.184 p. (educational and methodical manual).
5. Human anatomy (control of independent preparation for practical classes) for students. higher medical (pharmaceutical) studies. closing IV level of accreditation] / Educational and methodological manual / Edited by V.G. Cherkasova, I.V. Dzevulska I.V., O.I. Kovalchuk
6. Frederic Martini Anatomical atlas of man: Trans. from the 8th Eng. Type [scientificed.trans. V.G. Cherkasov], A-USPH "Medicine", 2017. 128 p. (Atlas)

13. Electronic information resources

1. <http://anatom.ua>. – the leading resource on Human Anatomy
2. <https://www.primalpictures.com>. – a 3D anatomy resource for educators, students, practitioners and professionals
3. <https://www.visiblebody.com> – resource of the international educational community «Visible Body»
4. <https://3d4medical.com> - the world's most advanced 3D anatomy platform
5. <https://info.odmu.edu.ua/chair/anatomy/files/6/ua> - materials from the course "Human Anatomy"