

Ministry of Science and Higher Education of the Russian Federation
Federal State Autonomous Institution of Higher Education
“National Research Nuclear University “MEPhI”

INSTITUTE OF ENGINEERING PHYSICS FOR BIOMEDICINE

DEPARTMENT OF FUNDAMENTAL MEDICINE

APPROVED ИТС ИФИБ

Protocol No. 3.1

dated 30.08.2024

ACADEMIC COURSE OUTLINE

АНАТОМИЯ / ANATOMY

Educational program track (speciality) [1] 31.05.01 General Medicine

Semester	Labour input, credits	Total course academic, hours	Lectures, hrs.	Practical sessions, hrs.	Laboratory sessions, hrs.	In the form of practical studies, hrs.	Independent studies, hrs.	Independent studies monitoring, hrs.	Course progress, Exam/Pass-fail exam/Term
1	3	108	14	0	50		44	0	PFE
2	4	144	30	0	60		54	0	PFE
3	5	180	16	0	30		80	0	Ex
Total	12	432	60	0	140	0	178	0	

ABSTRACT

The course develops students' knowledge of human anatomy, both the body as a whole and individual organs and systems, based on modern advances in macro- and microscopy, ultrasonography, and radiology. During this course, students gain knowledge of the structure, topography, blood supply, and innervation of internal organs, the musculoskeletal system, and sensory organs, as well as the principles of acquiring morphological knowledge necessary for further mastery of fundamental medical and clinical disciplines, and the ability to apply this knowledge to solve professional problems.

1. ACADEMIC COURSE GOALS AND OBJECTIVES

The goal of learning this course is to develop a system of knowledge about the structure of the human body, its systems and organs in their development, the structural features of human anatomy based on modern scientific advances, taking into account the requirements of practical medicine, and to develop the ability to apply this knowledge and methods in solving professional problems.

Objectives of Learning the Course

- to develop, through practical classes and lectures, a system of knowledge about the structure of the human body, its systems and organs in their development, the topography and function of organs, and individual age-related characteristics of the body's structure, including the prenatal period of development (organogenesis);
- to develop knowledge about the anatomical and topographic relationships of organs, the structural features of human anatomy based on modern advances in macro- and microscopy, ultrasonography, and radiation diagnostics;
- to develop an understanding of the variability of individual organs and systems, their developmental defects, and the clinical significance of these manifestations;
- develop the ability to use acquired knowledge and methods, as well as medical and anatomical concepts, in solving professional problems;
- develop the ability to recognize key anatomical elements on radiographs, CT scans, and ultrasonography;

2. PLACE OF THE ACADEMIC COURSE IN THE MAIN HIGHER EDUCATION CURRICULUM

The implementation of this course begins at the beginning of the course and continues for three semesters. The knowledge and skills acquired during the course serve as the basis for successful mastery of all medical disciplines.

3. DEVELOPED COMPETENCIES AND INTENDED LEARNING OUTCOMES

Universal and/or general professional competencies:

Competency code and title	Code and title of competency-based rubrics
ОПК-5 [1] – Capable of assessing morphofunctional and physiological states, as well as pathological	3-ОПК-5 [1] – Know: - basic medical, pharmaceutical, and morphofunctional terminology, including Latin terms; - structure and functions of the human body, age-related, gender-

processes in the human body to solve professional tasks.	specific, and individual characteristics of the structure and development of a healthy organism; - physical and chemical nature of processes occurring in a living organism; - patterns of vital activity of the organism, mechanisms of self-regulation and regulation; - features of regulation of the functioning of human body systems in pathological conditions; - patterns of occurrence, development, and outcome of typical pathological processes, the concept of sanogenesis; - etiology and pathogenesis of the most common diseases; - the concept of nosology, principles of disease classification; - principles of microorganism classification, their morphology, physiology, and impact on human health; - structure and functions of the human immune system. Y-OPIK-5 [1] – Be able to: - analyze mechanisms of disease development and manifestation; - recognize morphological and functional changes in cells, tissues, organs, and systems of the human body; - use basic physical-chemical and other natural science concepts and methods in solving professional tasks; - determine the cause of death and formulate a pathological diagnosis. B-OPIK-5 [1] – Possess skills in: - conducting microscopy and analyzing microscopic specimens; - correlating morphological and clinical manifestations of diseases; - assessing morphofunctional, physiological states, and pathological processes in humans; - clinical-anatomical analysis of autopsy results.
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4. PEDAGOGIC POTENTIAL OF THE COURSE

Pedagogic tracks/objectives	Pedagogic goals (code)
Intellectual education	Establishing conditions for: formation of culture of intellectual work (B11)
Vocational and labor education	Establishing conditions for: formation of a deep understanding of the profession's social role, a positive and active commitment to the values of the chosen specialty, and a responsible attitude towards professional activity and work (B14)

5. ACADEMIC COURSE STRUCTURE AND CONTENT

Academic course sections, their scope, terms of study and assessment:

No.	Academic course section name	Weeks	Lectures/ Practical (seminars)/ Laboratory sessions, hrs.	Compulsory current assessment (form*, week)	Maximum grade per section**	Section assessment (form*, week)	Competency-based rubrics
	<i>1 Semester</i>						
1	Osteology	1-4	4/0/10	T-4 (10)	10	T-4	3-ОПК-5, У-ОПК-5, В-ОПК-5
2	Craniology	5-8	4/0/10	T-8 (15)	15	T-8	3-ОПК-5, У-ОПК-5, В-ОПК-5
3	Syndesmology	9-12	3/0/14	T-12 (10)	10	T-12	3-ОПК-5, У-ОПК-5, В-ОПК-5
4	Myology	13-16	3/0/16	T-15 (15)	15	T-15	3-ОПК-5, У-ОПК-5, В-ОПК-5
	<i>Totals for 1 Semester</i>		14/0/50		50		
	Assessment events for 1 Semester				50	PFE	3-ОПК-5, У-ОПК-5, В-ОПК-5
	<i>2 Semester</i>						
1	Anatomy of the digestive system	1-3	8/0/15	T-4 (10)	10	T-4	3-ОПК-5, У-ОПК-5, В-ОПК-5
2	Anatomy of the respiratory system	4-7	6/0/12	T-5 (15)	15	T-5	3-ОПК-5, У-ОПК-5, В-ОПК-5
3	Anatomy of the genitourinary system	8-10	6/0/13	T-9 (10)	10	T-9	3-ОПК-5, У-ОПК-5, В-ОПК-5
4	Anatomy of the vascular and lymphatic systems. Organs of the immune system	11-15	10/0/20	T-15 (15)	15	T-15	3-ОПК-5, У-ОПК-5, В-ОПК-5
	<i>Totals for 2 Semester</i>		30/0/60		50		
	Assessment events for 2 Semester				50	GP	3-ОПК-5, У-ОПК-5
	<i>3 Semester</i>						
1	Central Nervous system	1-6	6/0/10	T-6 (15)	15	T-6	3-ОПК-5, У-ОПК-5, В-ОПК-5
2	Perefirical Nervous system	7-11	4/0/10	T-8 (10)	10	T-8	3-ОПК-5, У-ОПК-5, В-ОПК-5
3	Autonomic nervous system	12-13	4/0/4	T-13 (10)	10	T-13	3-ОПК-5, У-ОПК-5, В-ОПК-5

4	Organs of senses	14-16	2/0/6	T-15 (15)	15	T-15	3-ОПК-5, У-ОПК-5, В-ОПК-5
	<i>Totals for 3 Semester</i>		16/0/30		50		
	Assessment events for 3 Semester				50	Ex	3-ОПК-5, У-ОПК-5, В-ОПК-5

* – abbreviated name of assessment

** – 100 maximum points per semester including a pass/fail exam and (or) an exam

Abbreviated current assessment forms and section assessment

Abbreviation	Full name
GP	Graded pass
T	Testing
PFE	Pass/fail examination
Ex	Exam

SYLLABUS

Weeks	Topics / Content	Lect., hrs.	Pr./sem., hrs.	Lab., hrs.
	<i>1 Semester</i>	14	0	50
1-4	Osteology	4	0	10
1 - 2	Introduction to Anatomy Anatomy as a discipline: goals, objectives, methods of study, basic terms and concepts	All		
		2	0	2
		Online		
		0	0	0
2 - 4	General osteology. Bone as an organ. Structure of the axial skeleton. General structure of the vertebrae. The spinal column.	All		
		2	0	8
		Online		
		0	0	0
5-8	Craniology	4	0	10
5 - 7	General craniology. The cranial and facial skull, its components, the cranial roof. The internal and external base of the skull. The orbit, oral cavity, and nasal cavity. The temporal, infratemporal, and pterygopalatine fossae, their walls, and connections with adjacent cavities. The skull of the newborn and the elderly	All		
		2	0	4
		Online		
		0	0	0
7 - 8	Specialized Craniology The bones of the cranial and facial regions of the skull, their structural features.	All		
		2	0	6
		Online		
		0	0	0
9-12	Syndesmology	3	0	14
9 - 11	General arthrology. Bone connections, classification, and development	All		
		2	0	6
		Online		
		0	0	0
11 - 12	Specialized arthrology.	All		

	Joints of the skull bones, vertebrae, ribs, sternum, shoulder girdle bones, upper limb joints, pelvic girdle bones, and lower limb joints	2	0	7
		Online		
		0	0	0
13-16	Myology	3	0	16
13 - 15	General myology. Types of muscle tissue, classification, structure, and development	All		
		2	0	8
		Online		
		0	0	0
15 - 16	Special Myology Muscles of the head, neck, trunk, upper and lower extremities, topography	All		
		2	0	7
		Online		
		0	0	0
	<i>2 Semester</i>	30	0	60
1-3	Anatomy of the digestive system	8	0	15
1 - 2	Anatomy of the abdominal organs Anatomy of the stomach, duodenum, liver, gallbladder, bile ducts, and pancreas. Topography of the digestive system organs in the abdominal cavity	All		
		2	0	2
		Online		
		0	0	0
2 - 3	Splanchnology Development of the digestive system. Oral cavity, lips, teeth, tongue, salivary glands.	All		
		2	0	8
		Online		
		0	0	0
4-7	Anatomy of the respiratory system	6	0	12
4 - 7	Anatomy of the Respiratory System General anatomy and structural features of the respiratory system. Nasal cavity and larynx. Trachea, main bronchi. Lungs. Pleura.	All		
		2	0	8
		Online		
		0	0	0
8-10	Anatomy of the genitourinary system	6	0	13
8 - 10	Anatomy of the genitourinary system General anatomy and development of the excretory organs. Kidneys. Ureters, bladder, and urethra. Anatomy of the female and male reproductive organs.	All		
		2	0	8
		Online		
		0	0	0
11-15	Anatomy of the vascular and lymphatic systems. Organs of the immune system	10	0	20
11 - 12	Anatomy of the cardiovascular system Patterns of vascular flow. Anastomoses and collateral circulation. Anatomy of major arterial trunks and their branches.	All		
		2	0	8
		Online		
		0	0	0
12 - 13	Heart Anatomy Functional anatomy of the heart. Development of the heart and blood vessels. Heart and pericardium	All		
		2	0	4
		Online		
		0	0	0
13 - 14	Anatomy of the venous system The venous system. The superior and inferior vena cava system. Intersystem anastomoses	All		
		2	0	6
		Online		
		0	0	0
14 - 15	Anatomy of the lymphatic system The lymphatic system (lymphatic ducts, vessels, trunks, regional groups of lymph nodes).	All		
		2	0	4
		Online		
		0	0	0

	3 Semester	16	0	30
1-6	Central Nervous system	6	0	10
1 - 2	General Neurology. Development of the Central Nervous System Spinal cord. Formation of spinal nerves. Medulla oblongata. Reticular formation. Hindbrain (pons, cerebellum), fourth ventricle. Midbrain. Diencephalon, third ventricle. Internal structure of the brain. Basal ganglia.	All		
		2	0	4
		Online		
		0	0	0
3 - 4	Lateral ventricles of the brain. Olfactory brain. Hemispheres, sulci, and convolutions of the telencephalon. Localization of analyzers in the cerebral cortex	All		
		2	0	4
		Online		
		0	0	0
5 - 6	The membranes of the brain and spinal cord. Sensory pathways. Motor pathways	All		
		2	0	2
		Online		
		0	0	0
7-11	Peripheral Nervous system	4	0	10
7 - 9	Rhomboid fossa, projection of the cranial nerve nuclei Rhomboid fossa, projection of the cranial nerve nuclei I, II, III, IV, VI pairs of cranial nerves. V pair of cranial nerves. VII, VIII, IX pairs of cranial nerves	All		
		2	0	5
		Online		
		0	0	0
10 - 11	Cranial nerves X, XI, and XII. Cranial nerves X, XI, and XII. Autonomic components of the cranial nerves. Sensory ganglia. Innervation of the skin and muscles of the scalp, tongue, pharynx, and larynx	All		
		2	0	5
		Online		
		0	0	0
12-13	Autonomic nervous system	4	0	4
	Cervical plexus. Brachial plexus. Thoracic nerves. Lumbar plexus. Sacral plexus. General principles of the autonomic nervous system. Cervical plexus. Brachial plexus. Thoracic nerves. Lumbar plexus. Sacral plexus. General principles of the autonomic nervous system. Spinal nerve roots. Formation of the somatic nerve plexuses	All		
		2	0	2
		Online		
		0	0	0
12 - 13	The parasympathetic division of the autonomic nervous system. The parasympathetic division of the autonomic nervous system. The influence of sympathetic nerves on the function of internal organs. Their role in tissue and organ nutrition. Their role in the formation of autonomic nerve plexuses.	All		
		2	0	2
		Online		
		0	0	0
14-16	Organs of senses	2	0	6
14 - 16	Anatomy of the eyeball. Accessory apparatus of the eye. Visual analyzer. Anatomy of the eyeball. Accessory apparatus of the eye. Visual analyzer. Organ of hearing and balance. Vestibular apparatus	All		
		2	0	4
		Online		
		0	0	0

Abbreviated names of online options:

Abbreviation	Full name
EC	E-course
FtM	Full-text material
FtL	Full-text lectures
VM	Video materials
AM	Audio materials
Prs	Presentations
T	Tests
ERM	E-reference materials
IS	Interactive site

LABORATORY (LAB) SESSIONS TOPICS

Weeks	Topics / Content
	<i>1 Semester</i>
1 - 2	Introduction to Anatomy Introduction to anatomy. Anatomical nomenclature. Axes and planes of the human body. Introduction to anatomy. General information on the structure of the vertebrae. Cervical and thoracic vertebrae. Structural features in children. Anatomy as a science and subject of teaching. Methods of anatomical research. Brief historical overview of the development of anatomy. Anatomical nomenclature. Axes and planes of the human body, structural asymmetry. Levels of body structure. The musculoskeletal system: active and passive parts. The concept of the skeleton and its functions. Bone as a component of the skeleton. Structure and classification of bones. Bone as an organ. Chemical composition and physical properties of bones. Bone growth and development. Bone growth in length and thickness. External and internal factors of bone growth and development. The effects of mechanical loads on bone growth. General and local changes in bones during sports (changes in the periosteum, compact and spongy bone tissue, and bone marrow cavity).
3 - 4	The skeleton of the trunk. The skeleton of the head (skull). The appendicular skeleton (skeleton of the limbs). The vertebral column, its structure and functional significance. Sections of the vertebral column. General structure of the vertebra. Features of the cervical, thoracic, and lumbar vertebrae. The structure of the sacrum and coccyx. Vertebral joints: junctions of the bodies, arches, and processes of the vertebrae. Intervertebral discs and their structure. Intervertebral joints. Ligaments of the vertebral column. The connection of the vertebral column to the skull. The connection of the sacrum to the coccyx. The vertebral column as a whole. Its supporting and spring properties. Physiological curves of the vertebral column and their functional significance. The concept of scoliosis. Movement of the vertebral column. Changes in the curves of the vertebral column during movement. The rib cage. The bony basis of the rib cage. The structure of the ribs and sternum. True, false, and variable ribs. Articulations of the ribs with the sternum and vertebral column. The rib cage as a whole. Shapes of the rib cage. Age- and gender-specific characteristics of the rib cage. Specific structural features of the vertebral column and rib cage in humans in relation to the upright body position. The pelvic girdle and free upper limb. Bones of the pelvic girdle. The clavicle and scapula, their structure and location. The sternoclavicular and acromioclavicular joints, the shape of the articular surfaces, axes of rotation and motion. The free upper limb and its sections. Bones of the free upper limb: humerus, radius, and ulna, carpal bones, metacarpus, and digits, their structure and location. The pelvic girdle and free lower limb. Bones of the pelvic girdle. The ilium, ischium, and

	pubis. The connection of the pelvic girdle bones. The sacroiliac joint, its structure and movements. The pubic symphysis. The pelvis as a whole. The greater and lesser pelvis. Age, gender, and individual characteristics of the pelvis. The free lower limb and its sections. Bones of the free lower limb: femur, tibia, fibula, patella, bones of the foot - the bones of the tarsus, metatarsus, and toes, their structure and location
5 - 8	Bones of the cranial compartment of the skull. General characteristics of the skull. Cerebral and facial compartments of the skull. Bones of the cranial compartment. Structure of the cranial compartment bones: frontal, sphenoid, occipital, parietal, ethmoid, and temporal. Bones of the facial skull. The structure of the facial bones: maxilla and mandible, inferior nasal concha, vomer, nasal, lacrimal, zygomatic, palatine, and hyoid. The skull as a whole. Topography of the skull: vault, external and internal bases of the skull. Anterior, middle and posterior cranial fossae; orbit, nasal cavity; bony basis of the oral cavity; temporal, infratemporal and pterygopalatine fossae. Articulations of the cranial bones: sutures (dentate, squamosal, flat), impaction, synchondroses; temporomandibular joint. Buttresses of the skull and their significance. Age-related, gender-related, and individual characteristics of the skull. The skull of a newborn (fontanelles, relationship of the facial and cranial skull, etc.). The skull of an elderly person.
9 - 12	Bones of the cranial compartment of the skull. General characteristics of the skull. Cerebral and facial sections of the skull. Bones of the cranial compartment. Structure of the bones of the cranial compartment: frontal, sphenoid, occipital, parietal, ethmoid, and temporal. Bones of the facial skull. Structure of the bones of the facial skull: maxilla and mandible, inferior nasal concha, vomer, nasal, lacrimal, zygomatic, palatine, and hyoid. The skull as a whole. Topography of the skull: vault, external and internal bases of the skull. Anterior, middle, and posterior cranial fossae; orbit, nasal cavity; bony basis of the oral cavity; temporal, infratemporal, and pterygopalatine fossae. 8 Articulations of the cranial bones: sutures (dentate, squamosal, and flat), impaction, synchondroses; temporomandibular joint. Buttresses of the skull and their significance. Age-related, gender-related, and individual characteristics of the skull. The newborn skull (fontanelles, relationship between the facial and cranial skull, etc.). The elderly skull.
13 - 16	Theory of Muscles Muscle tissue: smooth (non-striated), striated (striated), and cardiac: their structural features and functions. Muscle as an organ. Accessory muscle apparatus and their functional significance. Blood supply and innervation of muscles. Muscle origin and insertion. Muscle functions. Classification of muscles by shape, structure, origin, and function. Strong and dexterous muscles. The relationship between muscle shape and function. Functional characteristics of muscles. Muscle tone. The concept of the anatomical and physiological cross-section of muscles. Muscle strength and the factors that determine it. Characteristics of muscle work (overcoming, yielding, and holding muscle work). The relationship of muscles to bones as levers. The laws of leverage and muscle work. Examples of levers of the first, second and third kind in the human locomotor system. Muscles of the trunk. A brief overview of the muscles of the trunk by area: muscles of the chest, abdomen, neck and back. Muscles of the back. Superficial and deep muscles of the back. Back fascia. Development of the back muscles. Functions of the back muscles during various types of movement and support. Muscles of the chest. Superficial and deep muscles of the chest. Respiratory muscles. The diaphragm, its position, structure and functions. Intercostal muscles. Fascia of the chest. Abdominal muscles. Muscles of the anterior, posterior and lateral walls of the abdomen. Functions of the abdominal muscles during various types of support. Abdominal fascia and topographic formations of the abdominal wall. Weakly protected areas of the abdominal wall: linea alba, inguinal canal. Abdominal muscles and their functional significance in athletes. Functional muscle groups that produce movements of the spinal

	column. Tilt of the spinal column to the side. Twisting of the spinal column. Muscles involved in breathing: inhalatory muscles and exhalatory muscles (primary, accessory, indirectly involved). Muscles of the head and neck. Muscles of the head. Classification of the head muscles. Masticatory muscles. Muscles involved in the movements of the lower jaw. Facial muscles, their position and functions. Muscles of the neck. Classification of the neck muscles. Superficial muscles of the neck. Muscles located above and below the hyoid bone. Deep muscles of the neck. Fasciae of the neck. Functional muscle groups involved in head movements (flexion, extension, side bending and rotation). Muscles of the upper limb. Overview of the muscles of the upper limb. Muscles of the girdle of the upper limb and the free upper limb. Muscles involved in the movements of the girdle of the upper limb. Sites of origin, insertion, location in relation to the axes of movement in the joints. Muscles of the free upper limb: muscles of the shoulder, forearm, hand. Sites of origin and insertion of muscles. Functional muscle groups that produce movements in the shoulder joint (flexion, extension, abduction, adduction, supination, and pronation). Functional muscle groups that produce movements in the elbow joint (flexion, extension, supination, and pronation). Functional muscle groups that produce movements of the hand (flexion, extension, abduction, adduction). Connective tissue formations of the muscles of the upper limb. Fascia, intermuscular septa, synovial sheaths of the tendons of the muscles of the hand. Functions of the muscles of the upper limb during proximal and distal support. Muscles of the lower limb. Overview of the muscles of the lower limb. Muscles of the girdle of the lower limb (pelvic girdle) and muscles of the free lower limb. Muscles of the girdle of the lower limb: structure, functions. Origin and insertion sites of the pelvic girdle muscles, their location. Muscles of the free lower limb: muscles of the thigh, lower leg, foot. Fascia, bursae, and tendon sheaths. Muscle structure and function of the lower limb in relation to the upright human body position. Comparative characteristics of the muscles of the upper and lower limbs. Functional muscle groups that produce movement at the hip joint (flexion, extension, abduction, adduction, supination, and pronation). Functional muscle groups that produce movement at the knee joint (flexion, extension, supination, and pronation). Functional muscle groups that produce movement of the foot and toes (flexion, extension, abduction, adduction, supination, and pronation). Muscles that strengthen the arches of the foot.
	<i>2 Semester</i>
1 - 2	Development of the digestive system. Oral cavity, lips, teeth, tongue, salivary glands, soft palate, pharynx, esophagus. Oral cavity: vestibule and oral cavity proper, their walls and connections. Lips, oral fissure, cheeks and buccal fat pad. Tongue, its structure (parts, surfaces, mucosal relief, intrinsic and skeletal muscles of the tongue, lingual tonsil). Teeth, their development. External shape and structure of the tooth. Dental formula of primary and permanent teeth. Minor glands of the oral mucosa: labial, buccal, palatine, lingual. Major salivary glands: parotid, submandibular, sublingual. Hard and soft palate. Soft palate, palatine aponeurosis. Development of the pharynx and esophagus. External shape and structure of the pharynx (walls, parts, and connections). Esophagus. Development. Length and parts of the esophagus. Holotopy, skeletotopy, syntopy. Wall structure.
1 - 2	Stomach. Duodenum. Intestine Development of the stomach. The role of the stomach in digestion. External shape, sections, walls, and curvatures of the stomach. Topography of the stomach (holotopy, skeletotopy, and syntopy) and their variability in a living person, taking into account functional, age-related, and constitutional features. Morphophysiological features of the mucous and muscular lining of the stomach. Relationship of the stomach to the peritoneum. Shape of the stomach and the relief of its mucosa in X-ray imaging. Development of the small intestine. Sections of the small intestine and their relationship to the peritoneum. Duodenum: external shape, parts, their position, skeletotopy, and syntopy. Holotopy, syntopy, and skeletotopy of

	the jejunum and ileum. Features of the relief, structure, and function of the mucosa of various sections of the small intestine. Structure of the villi. Lymphoid elements in the wall of the small intestine. The duodenum, jejunum, and ileum in an X-ray image. Development of the large intestine. Sections of the large intestine, their position in the abdominal cavity, relationship to adjacent organs and the peritoneum. Features of the external shape and internal structure of different sections of the large intestine. Anatomical and physiological features of the ileocecal angle (Bauhinus valve). Signs of differences between the small and large intestines. Pay special attention to the different position of the vermiform appendix, its structure. Rectum. Parts of the rectum, bends, skeletotopy and syntopy, parts of the rectum, relationship to the peritoneum; features of the structure of the muscular layer (sphincters) and the relief of the mucous membrane. Submucous venous plexus of the rectum. The large intestine in an X-ray image
2 - 3	Liver, Gallbladder, Biliary Tract, Pancreas The liver as a derivative of the midgut epithelium. External form of the liver (surfaces, edges, grooves, lobes). Hepatic ligaments. Contents of the grooves on the visceral surface of the liver. Holotopy, skeletotopy, syntopy, and relationship of the liver to the peritoneum. Segmental structure of the liver. Factors affecting liver fixation in the abdominal cavity. The structural and functional unit of the liver. The "miraculous" venous network of the liver. The role of the liver in the body. The gallbladder, its parts, topography, and excretory duct. Structural features of the gallbladder wall. Bile outflow pathways. Sphincteric structures of the biliary tract. Pancreas: structure, parts, relationship to the peritoneum, topography (holotopy, skeletotopy, syntopy). Structural and functional units of the pancreas, determining its function as an organ of external and internal secretion. Main and accessory excretory ducts. Development of the pancreas.
2 - 3	The peritoneum and the topography of the digestive organs in the abdominal cavity The peritoneum, its structure and functions. Development of the peritoneum. Ventral and dorsal mesentery. The course of the peritoneum in sagittal and horizontal sections of the torso. Features of the peritoneum and its relationship to the pelvic organs in men and women. Unifolia and bifolia ligaments and their origin. The mesenteries, their origin, role, and skeletotopy. The greater and lesser omentums. Peritoneal folds, their location, and clinical significance. Division of the peritoneal cavity into floors and their boundaries. The right and left subdiaphragmatic, subhepatic, and splenic recesses. The omental foramen and its boundaries. The omental bursa and its walls. The right and left mesenteric sinuses, lateral canals of the lower abdominal cavity. Peritoneal pouches: superior and inferior duodenal, superior and inferior ileocecal, retrocecal, and intersigmoid. Recesses of the peritoneal cavity in the lesser pelvis. Retroperitoneal space and its contents. Variations in the development of abdominal organs based on organogenesis. A detailed description of this section is available here
3 - 4	Final lesson on the topic "Digestive System." Test, practical skills, and oral presentation on the topic "Digestive System."
4 - 5	General anatomy and structural features of the respiratory system. Nasal cavity and larynx. External nose, its bony and cartilaginous skeleton. Nasal cavity: development, walls, sections, communications. Paranasal sinuses. Structural features of the mucous membrane. Functional and clinical significance of the nasal cavity. Larynx. Laryngeal topography (holotopy, skeletotopy, syntopy). Laryngeal cartilages, their connections to each other, to the trachea, and to the hyoid bone. Classification of laryngeal muscles by topography and function. Structures limiting the entrance to the larynx. Laryngeal cavity and its sections. Structure of the vocal cords. Elastic cone. Structural features of the mucous membrane.

	Morphological principles of sound production. Clinical significance of the larynx
4 - 5	Trachea, main bronchi. Trachea: macroscopic structure and shape. Tracheal topography (holotopy, skeletotopy, syntopy). Tracheal wall structure. Structural features of the tracheal and bronchial mucosa. Main bronchi and their topography. Differences in the structure of the right and left bronchi and the clinical significance of this fact.
5 - 6	Lungs. Pleura. Lung development. External shape: base, apex, surfaces, margins, fissures, lobes, hilum, and roots. Skeletotopy of the fissures and projection onto the skeleton. Branching of the bronchial tree and lungs. Definitions of the terms lobe, segment, lobule, and acinus (structural and functional unit of the lung). Morphological features of these terms. Concept of the segmental structure of the lungs. Structural features of the alveoli that provide gas exchange. Histotopogram of the lungs. The pleura as a serous membrane. Structure and function of the pleura. Pleural layers, sections of the parietal pleura. Pleural cavity. Boundaries (skeletotopy) of the parietal pleura and lungs. Pleural sinuses, their functional and clinical significance. Mechanism of respiratory movements of the lungs. Age-related changes in the structure of the chest wall and lungs and their impact on respiratory function. Pneumothorax as a pathological phenomenon and therapeutic agent
5 - 6	Mediastinum. Mediastinal organs. The mediastinum as a complex of organs. The mediastinal cavity and its walls. The sections of the mediastinum, their connections with the interorgan and interfascial spaces of the neck (clinical significance). The interpleural spaces and the organs located within them.
6 - 7	Final lesson on the topic "Respiratory System." Quiz, practical skills, oral presentation on the topic "Respiratory System."
8 - 9	General anatomy and development of the excretory organs. Kidney: external shape, structure (poles, edges, surfaces, hilum). Renal topography (holotopy, skeletotopy, syntopy). Relationship of the kidney to the peritoneum. Fixation apparatus. Kidney structure on frontal section and histotopograms: renal sinus, cortex and medulla, urinary tract within the renal sinus (major and minor calyces, their shape and number, renal pelvis). Microscopic structure of the kidney. Structural and functional unit of the kidney – the nephron. Renal corpuscle. Renal arterial glomerulus. Renal tubules. Arterial "miraculous" rete of the kidney. Morphological principles of urination. Kidney in radiographic images. Variations in kidney development and position, their clinical significance. Ureter: external shape, parts, topography (holotopy, skeletotopy, syntopy). Differences in the position of the ureter in men and women. Structure of the ureter wall. Development of the ureter and developmental variants. Urinary bladder: external shape, parts, topography, holotopy, skeletotopy and syntopy). The relationship of the bladder to the peritoneum depending on the filling. Prevesical cellular space. Structure of the bladder wall. Features of the relief of the mucous membrane. Vesicular triangle (Lieto). Causes of separation of the bladder triangle from the surrounding mucous membrane, clinical significance. Muscular membrane of the bladder. The mechanism of urine flow from the ureter into the bladder, urine retention in the bladder and urination. Development of the bladder. Variants of the shape and position of the bladder
8 - 9	General anatomy and development of the male genital organs. Male genital organs. The testicle is a gland of external and internal secretion. External shape, structure, function, and topography. Epididymis: its position, external shape, and structure. Internal structure of the testicle and epididymis. Trace the path of the developing sperm through the structures of the testicle and epididymis. Endocrine function of the testicle. Histotopogram of the testicle and epididymis. Testicular tunics. Relationship of the testicular tunics to the layers of the anterior abdominal wall. Development of the testicle and epididymis. Developmental anomalies. Vas deferens: sections, topography, syntopy. Ampulla of the vas deferens.

	Structure of the duct wall. Spermatic cord: position, composition, tunics. Clinical significance of the ability to palpate the spermatic cord. The scrotum and its layers. The relationship of the scrotum layers to the layers of the anterior abdominal wall. Stages of testicle descent into the scrotum. Monorchism. Cryptorchidism. Anorchism. Clinical significance of the vaginal process of the peritoneum in the formation of congenital inguinal hernias (oblique). Seminal vesicles: external shape, topography. Relation to the peritoneum. Internal structure. Functional role in the body. Prostate gland: external shape, position, syntopy. Clinical significance of the possibility of palpating and massaging the gland through the rectum. Structural features of the prostate gland (smooth muscle and glandular tissue). Function of the gland. Age-related changes in the gland. Male penis: external shape and structure. Cavernous and spongy bodies of the penis, their internal structure. Fixing apparatus and muscles of the penis. Development of the penis and developmental anomalies. The concept of hermaphroditism. The male urethra and its parts. Narrowings, dilations, bends, and sphincters of the urethra. Structural features of the prostatic urethra. Clinical significance of urethral anatomy. Bulbourethral (Cowper's) gland: topography, structure, and functional significance. The entry point of the gland's excretory ducts into the urethra.
9 - 10	General anatomy and development of the female reproductive organs. Female reproductive organs General overview of the female reproductive system. Division of the female reproductive organs into internal and external. Ovary: external shape (surfaces, edges, ends), position, ligaments, relationship to the peritoneum. Internal structure of the ovary. Ovarian function depending on age (features of oocyte maturation, Graafian follicle, true and false corpus luteum). The ovary as an endocrine gland. Site of ovarian development and descent. Developmental variants and its rudimentary appendages. Vagina: walls, fornices, position, relationship with the cervix and pelvic organs. Clinical significance of the posterior fornix. Structure of the vaginal wall. Possibilities of vaginal examination of the pelvic walls and organs. Uterus: sections, syntopy, physiological position of the uterus, and functions. Structure of the uterine wall. Age-related changes in the uterus, changes in the uterus due to pregnancy. Ligaments of the uterus. Fixing apparatus of the uterus. Fallopian tubes: sections, topography, structural features in relation to the function they perform. Uterine cavity and lumen of the fallopian tubes in an X-ray image. Development of the internal female genital organs. Developmental defects of the uterus and its appendages. Pubis. Labia majora and minora. Vestibule of the vagina. Major and minor glands of the vestibule. Clitoris. Bulb of the vestibule. Hymen, forensic significance of variants in girls, nulliparous and parous women. Muscles of the female external genitalia. Development of the external female genitalia, developmental defects. The female urethra, its structure, topography, openings. Sphincters of the female urethra. Differences between the female and male urethra.
9 - 10	Muscles and fascia of the perineum (male and female). Final lesson on the topic "The Genitourinary System." Definition of the perineum. Perineal boundaries and division into regions. Classification of perineal muscles by origin. Functions of the perineal muscles. Perineal fascia. Urogenital and pelvic diaphragms. Perineal tendinous center. Differences between the male and female perineum. The importance of the perineum for surgical interventions, especially in obstetrics. Ischiorectal fossa and cavity. Walls of the ischiorectal cavity, contents, and components. Test, practical skills, and oral examination on the topic "The Genitourinary System."
11 - 12	The aorta and its parts. The aortic arch and its branches. The aortic arch and its branches. The heart's own blood vessels
11 - 12	The thoracic aorta, blood supply to the heart. The thoracic aorta and its branches. Blood supply to the trachea, bronchi, lungs, and esophagus. Blood supply and innervation of the chest walls.

12 - 13	Subclavian artery and its branches. Axillary artery and its branches. Subclavian artery, its topography, branches, and anastomoses with branches of the external carotid artery of the thoracic aorta. Axillary and brachial arteries, their branches, and anastomoses
12 - 13	The common carotid artery and its branches. The external carotid artery and its branches. The facial artery and its branches in the neck and head. The superficial temporal artery. The maxillary artery and its branches. Blood supply and innervation of the tongue, teeth, masticatory muscles, parotid and submandibular glands. The internal carotid artery and its branches. The vertebral artery, its branches, and anastomoses with the internal carotid artery. Blood supply to the brain – the arterial circle at the base of the brain (circle of Willis).
13 - 14	Arteries of the upper limb. The radial and ulnar arteries, their branches, and anastomoses with the branches of the brachial artery. Arteries of the hand: the superficial and deep arterial arches, their formation, and their connections.
13 - 14	The abdominal aorta and its branches. The common, external, and internal iliac arteries and their branches. Arteries of the lower limb. The abdominal aorta, its unpaired branches, and anastomoses between them. Paired branches of the abdominal aorta. The external and internal iliac arteries and their branches. Topography of the common iliac artery. Bifurcation of the common iliac artery. The external iliac artery. Branches of the external iliac artery. Topography of the inferior epigastric artery. The internal iliac artery. Anterior and posterior groups of branches. The parietal and visceral branches of the internal iliac artery and their topography. The obturator artery and its formation variants. The "crown of death." The femoral artery and its branches. The popliteal artery and its branches. The posterior tibial artery. Arterial network of the knee joint.
14 - 15	Venous system. Superior vena cava. Veins of the upper limb. Anatomy of the portal vein. Concept of the venous system. Formation of the superior vena cava. Parana and hemiazygos veins. Superficial and deep veins of the upper limb. Anatomy of the portal vein, caval and portocaval anastomoses.
14 - 15	Anatomy of the Lymphatic System Understanding the lymphatic and immune systems. Vessels and organs of the lymphatic system.
14 - 15	Organs of the immune system Central and peripheral organs of the immune system.
15 - 16	Final lesson on the topic "Anatomy of the Vascular and Lymphatic Systems. Organs of the Immune System." Test, practical skills, oral quiz on the topic
	<i>3 Semester</i>
1 - 2	General Neurology. Development of the Central Nervous System. Spinal Cord. Formation of Spinal Nerves. Medulla Oblongata. Reticular Formation General Neurology. Development of the Central Nervous System. Spinal Cord. Formation of Spinal Nerves. Medulla Oblongata. Reticular Formation The structural unit of the nervous system is the neuron and its parts. Reflex Arc. Development of the Central Nervous System. External Form of the Spinal Cord. Spinal Nerve Roots. Cauda Equina. Spinal Nerves and Their Branches. Spinal Cord Segment. Topography of Segments. Spinal Cord Cross-Section: Topography of Gray and White

	Matter. Position of Nuclei in the Gray Matter of the Spinal Cord. Topography of the White Matter of the Spinal Cord. Composition of the Posterior, Lateral, and Anterior Funiculi. Spinal Cord Meninges. Intermeningeal Spaces. Fixation Apparatus of the Spinal Cord The Brain, Its Development and Parts. The Medulla Oblongata as Part of the Rhombencephalon. Boundaries and External Landmarks. Internal Structure of the Medulla Oblongata
2 - 3	Hindbrain (pons, cerebellum), fourth ventricle. Midbrain. Hindbrain (pons, cerebellum), fourth ventricle. Midbrain. The pons as part of the rhombencephalon. External shape and position of the pons. Fourth ventricle, its floor and roof. The cerebellum as part of the hindbrain. Position, external shape, and relief of the cerebellum. Gray and white matter of the cerebellum in cross-section, cortex, nuclei. Cerebellar peduncles and the tracts they contain. Boundaries of the midbrain, its cavity, and divisions. Quadricollis, nuclei of the superior and inferior colliculi, and their functional significance. Cerebral peduncles. Tegmentum of the midbrain. Base of the cerebral peduncles. Substantia nigra. Gray matter of the tegmentum of the peduncles—red nuclei.
3 - 4	Diencephalon, third ventricle. Internal structure of the brain. Basal ganglia. Diencephalon, third ventricle. Internal structure of the brain. Basal ganglia. The diencephalon, its development and components. The thalamic region of the thalamus and its divisions. Nuclei and functional significance of the thalamus. The pineal gland, geniculate bodies, and their role in the auditory and visual analyzers. The hypothalamus and its divisions. Features of the optic chiasm. The pituitary gland. Nuclei of the hypothalamus and their functional significance. The third ventricle, its walls, communications, and choroid plexus. Basal ganglia of the hemispheres. The concept of the stromal-pallidal system and its role in the extrapyramidal system. The internal capsule, its divisions, and localization of the conducting pathways. The corpus callosum, fornix.
4 - 5	Lateral ventricles of the brain. Olfactory brain. Hemispheres, sulci, and convolutions of the telencephalon. Localization of analyzers in the cerebral cortex. Lateral ventricles of the brain. Olfactory brain. Hemispheres, sulci, and convolutions of the telencephalon. Localization of analyzers in the cerebral cortex. Lateral ventricles, their sections and walls, communications with the third ventricle. Olfactory brain, its central and peripheral sections. Olfactory nerves. Topography of the cerebral mantle (the surface of the hemispheres, the boundaries of the lobes, sulci, and convolutions). Position of the lobes in the cranial cavity. Dynamic localization of functions in the cerebral cortex, projection and association centers.
5 - 6	The membranes of the brain and spinal cord. Sensory tracts. Motor tracts. The membranes of the brain and spinal cord. Sensory tracts. Motor tracts. Structure of the dura mater: processes and venous sinuses. Arachnoid and pia mater (choroid). Subarachnoid space and its cisterns. Communications of the subarachnoid space with the fourth ventricle. The cerebrospinal fluid circulation from the site of formation to the area of resorption. Classification of the tracts of the brain and spinal cord. Sensory tracts. Motor tracts. Extrapyramidal tracts.
6	Final lesson on the topic "Central Nervous System." Final lesson on the topic "Central Nervous System." Test. Oral answer.

7 - 8	The rhomboid fossa, projection of the cranial nerve nuclei. The rhomboid fossa, projection of the cranial nerve nuclei. The 10th, 11th, and 12th pairs of cranial nerves, their nuclei (names and positions), the exit of the roots from the brain and skull, the peripheral branches of the cranial nerves, their fiber composition, and the areas (organs) of innervation. Autonomic components of the cranial nerves. Sensory ganglia. Innervation of the skin and muscles of the scalp, tongue, pharynx, and larynx.
8 - 9	I, II, III, IV, and VI pairs of cranial nerves. I, II, III, IV, and VI pairs of cranial nerves. Structure of the rhomboid fossa. Projection of the cranial nerve nuclei onto the floor of the rhomboid fossa. I, II, III, IV, and VI pairs of cranial nerves, their nuclei (names and positions), the exit of the roots from the brain and skull, peripheral branches of the cranial nerves, their fiber composition, and innervation regions (organs). Autonomic components of the cranial nerves. Sensory ganglia.
9 - 10	Cranial nerves 5, VII, VIII, and IX. Cranial nerves 5, VII, VIII, and IX. Innervation of the skin and muscles of the head, major salivary glands, tongue, pharynx, larynx, and lacrimal gland. Cranial nerves 5, their nuclei (name and position), rootlets exiting the brain and skull, peripheral branches of the cranial nerves, their fiber composition, and innervation areas (organs). Sensory ganglia. Cranial nerves 7, VIII, and IX, their nuclei (name and position), rootlets exiting the brain and skull, peripheral branches of the cranial nerves, their fiber composition, and innervation areas (organs). Autonomic components of the cranial nerves. Sensory ganglia. Innervation of the skin and muscles of the head, major salivary glands, tongue, pharynx, larynx, and lacrimal gland.
10 - 11	Cranial nerves X, XI, and XII. Cranial nerves X, XI, and XII. Cranial nerves X, XI, and XII, their nuclei (names and positions), rootlets exiting the brain and skull, peripheral branches of the cranial nerves, their fiber composition, and innervation regions (organs). Autonomic components of the cranial nerves. Sensory ganglia. Innervation of the skin and muscles of the scalp, tongue, pharynx, and larynx.
11	Final lesson on the topic "Cranial Nerves." Final lesson on the topic "Cranial Nerves." Testing, practical skills, oral presentation
12	Cervical plexus. Brachial plexus. Thoracic nerves. Lumbar plexus. Sacral plexus. General principles of the autonomic nervous system. Parasympathetic division of the autonomic nervous system. Cervical plexus. Brachial plexus. Thoracic nerves. Lumbar plexus. Sacral plexus. General principles of the autonomic nervous system. Parasympathetic division of the autonomic nervous system. Spinal nerve roots. Formation of the somatic nerve plexuses. Cervical plexus. Cutaneous, muscular, and mixed branches of the cervical plexus. Brachial plexus. Formation of the trunks, fascicles, and nerves of the brachial plexus. Supraclavicular and infraclavicular parts of the brachial plexus. Areas of innervation of the skin and muscle groups. Formation of the intercostal nerves. Areas of cutaneous and muscular innervation of the thoracic nerves. Lumbar plexus. Formation of the nerves of the lumbar plexus. Areas of innervation of the skin and muscle groups.

	Sacral plexus. Short and long branches of the sacral plexus. Their topography. Divisions of the autonomic nervous system. Autonomic reflex arc. Differences between the sympathetic and parasympathetic reflex arcs. Central and peripheral divisions of the sympathetic and parasympathetic divisions of the autonomic nervous system. Principles of innervation of the organs of the thoracic and abdominal cavities. Parasympathetic division of the autonomic nervous system. Localization of nuclei in the central nervous system. The vagus nerve and its parasympathetic branches. The influence of the vagus nerve on the functions of internal organs. Participation in the formation of the autonomic plexuses. Sympathetic division of the autonomic nervous system. Localization of nuclei in the central nervous system. The sympathetic trunk and its branches. The influence of sympathetic nerves on the functions of internal organs. Importance in tissue and organ trophism. Participation in the formation of the autonomic plexuses
13	Final lesson on the topic " Autonomic nervous system." Testing, practical skills, oral presentation
	Final lesson on the topic " Organs of senses." Final lesson on the topic " Organs of senses." Testing, practical skills, oral presentation
14 - 15	Anatomy of the eyeball. Accessory apparatus of the eye. Visual analyzer. Anatomy of the eyeball. Accessory apparatus of the eye. Visual analyzer. Components of the visual organ: eyeball, optic nerve, and accessory apparatus of the eye. Capsule and nucleus of the eyeball. Three membranes comprising the capsule. Nucleus of the eyeball. Anterior and posterior chambers of the eye and their connections. Ligament of Zinn. Petit's canal. Fontan spaces. Schlemm's canal. Outflow of aqueous humor. Optic nerve (II pair), exit from the skull, optic chiasm. Accessory apparatus of the visual organ. Muscles of the extraocular system. Lacrimal apparatus. Lacrimal pathway. Orbital fascia. Tenon's capsule and epidural space. Orbital fat pad
15 - 16	The organ of hearing and balance. The organ of hearing and balance. Parts of the organ of hearing and balance. The outer ear. External auditory canal. Eardrum. The middle ear and its parts: the tympanic cavity, auditory tube, and mastoid cells. The walls, communications, contents, and syntopy of the tympanic cavity. The inner ear and its parts: the bony and membranous labyrinths and their divisions. The structure of the cochlea. Functions that ensure sound transmission. The organ of balance. The vestibular apparatus

6. EDUCATIONAL TECHNOLOGIES

- Traditional lectures with the use of multimedia technology (slide presentations).
- Traditional laboratory sessions with the use of anatomical specimens, posters, test programs, and situational problems.
- Laboratory sessions in simulated conditions using an interactive dissection table.

7. ASSESSMENT TOOLKIT

The assessment toolkit ensures verification of the intended learning outcomes achievement (competency-based rubrics) using current, midterm and interim assessment of the course.

The link between developed competencies and their assessment is presented in the following table:

Competency	Achievement rubrics	Assessment activity (Syl 1)	Assessment activity (Syl 2)	Assessment activity (Syl 3)
ОПК-5	3-ОПК-5	PFE, T-4, T-8, T-12, T-15, T-4, T-8, T-12, T-15	GP, T-4, T-5, T-9, T-15, T-4, T-5, T-9, T-15	Ex, T-6, T-8, T-13, T-15, T-6, T-8, T-13, T-15
	У-ОПК-5	PFE, T-4, T-8, T-12, T-15, T-4, T-12	GP, T-4, T-5, T-9, T-15, T-4, T-9	Ex, T-6, T-8, T-13, T-15, T-6, T-8
	В-ОПК-5	PFE, T-4, T-8, T-12, T-15, T-8, T-15	T-4, T-5, T-9, T-15	Ex, T-6, T-8, T-13, T-15, T-13, T-15

Educational achievement rubrics scales

The scale of each assessment activity varies from 0 to the maximum established point, inclusive. The final assessment of the course is performed on a 100-point scale and represents the sum of the points earned by the student in the section assessments, framework of current and interim assessment.

Sections and interim assessments are considered passed when the student achieves a minimum score equal to 60% of the maximum. The final grade is assigned only upon passing all sections and the interim assessment.

The final grade is assigned in accordance with the following scale:

Total score	Rating on a 4-point scale	Pass/fail examination	ECTS assessment
90-100	5 – « <i>excellent</i> »	« <i>pass</i> »	A
85-89	4 – « <i>good</i> »		B
75-84			C
70-74			D
65-69	3 – « <i>satisfactory</i> »		E
60-64			F
below 60	2 – « <i>fail</i> »	« <i>fail</i> »	

An “excellent” grade indicates a deep and solid mastery of the program material by a student who presents their answers consistently, clearly, and logically, is able to closely link theory with practice, and uses materials from monographic literature in their answers.

A “good” grade corresponds to a student’s solid knowledge of the material, who presents their answers competently and to the point, without any significant inaccuracies.

A “satisfactory” grade corresponds to the basic level of mastery of the material by the student, in which the main material has been mastered, but its details have not been assimilated, the answers contain inaccuracies, insufficiently correct wording and logical inconsistencies.

A grade “pass” corresponds to at least a basic level of mastery of the program material, in which the student possesses the necessary knowledge, skills, and abilities, and is able to apply theoretical principles to solve typical practical problems.

A grade “fail” is given to a student who lacks a significant understanding of the curriculum material, makes significant errors in their answers, or fails all required assignments. These students are generally unable to continue their studies without additional classes.

8. ACADEMIC COURSE EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT

CORE READING:

1. ЭИ К70 Textbook of Human Anatomy. In 3 vol. Vol. 1. Locomotor apparatus : , Kolesnikov L.L. [и др.], Москва: ГЭОТАР-Медиа, 2020
2. ЭИ Т42 Textbook of Human Anatomy. In 3 vol. Vol. 2. Splanchnology and cardiovascular system : учебник, , Москва: ГЭОТАР-Медиа, 2020
3. ЭИ Т42 Textbook of Human Anatomy. In 3 vol. Vol. 3. Nervous system. Esthesiology : учебник, , Москва: ГЭОТАР-Медиа, 2020
4. ЭИ К 60 Анатомия человека : атлас : в 3 т. Т. 1. Остеология, артросиндесмология, миология : учебное наглядное пособие, Колесников Л.Л., Москва: ГЭОТАР-Медиа, 2018
5. ЭИ С 19 Анатомия человека. В 2 томах. Том 1. : учебник, Сапин М.Р., Москва: ГЭОТАР-Медиа, 2018
6. ЭИ С 19 Анатомия человека. В 2 томах. Том 2. : , Сапин М.Р., Москва: ГЭОТАР-Медиа, 2018

FURTHER READING:

1. ЭИ В84 Neuroanatomy and Pathology of Sporadic Parkinson's Disease : , Braak, Heiko. , Tredici, Kelly Del. , Berlin, Heidelberg: Springer Berlin Heidelberg,, 2009
2. ЭИ Б 61 Атлас анатомии человека. Том 2. Внутренние органы : учебное наглядное пособие, Билич Г.Л., Крыжановский В.А., Москва: ГЭОТАР-Медиа, 2013
3. ЭИ А 92 Атлас анатомии человека: в 3-х т. Том 3 : Рекомендовано ГОУ ВПО "Московская медицинская академия имени И.М. Сеченова" в качестве учебного пособия студентам учреждений высшего профессионального образования, обучающимся по специальностям 060101.65 "Лечебное дело", 060103.65 "Педиатрия", 060105.65 "Медико-профилактическое дело", 060201.65 "Стоматология" по дисциплине "Анатомия человека"., , Москва: ГЭОТАР-Медиа, 2013

SOFTWARE:

1. Microsoft Office 2016+ ()

2. Microsoft Word (K64-303)

LMS AND ONLINE RESOURCES

1. Terminologia Anatomica (<http://terminologia-anatomica.org/en>)

<https://online.mephi.ru/>

<http://library.mephi.ru/>

9. LOGISTICAL SUPPORT

1. Персональный компьютер: Моноблок Lenovo V540-24IWL All-In-One 23,8" i3-8145U 8Gb 256GB_SSD_M.2 Intel (64-403)

2. Интерактивная доска SMART SBM 685 (64-403)

3. Проектор SMART P109 (64-403)

4. Видеокамера Microsoft LifeCam Cinema HD (64-403)

5. «Интерактивный анатомический стол «Пирогов I» с программным обеспечением «3D атлас нормальной и топо (64-403)

6. Пластинированные анатомические препараты - части тела человека (64-403)

7. Демонстрационные модели тела человека (64-403)

8. Демонстрационные модели опорно-двигательного аппарата (64-403)

9. Демонстрационные модели сердечно-сосудистой системы (64-403)

10. Демонстрационные модели пищеварительной системы (64-403)

11. Демонстрационные модели мочеполовой системы (64-403)

12. Персональный компьютер: Моноблок Lenovo V540-24IWL All-In-One 23,8" i3-8145U 8Gb 256GB_SSD_M.2 Intel (64-402)

13. Мышь, клавиатура (64-403)

14. Мышь, клавиатура (64-402)

15. Интерактивная доска SMART SBM 685 (64-402)

16. Проектор SMART P109 (64-402)

17. Мебель лабораторная, стулья, шкафы для хранения (64-402)

18. Мойка лабораторная (64-402)

19. Шкаф лабораторный вытяжной "Лабтех" ШВ202 (64-402)

20. Пластинированный анатомический препарат "Мышцы целого тела" (64-402)

21. Пластинированные анатомические препараты - части тела человека (64-402)
22. Демонстрационные модели тела человека (64-402)
23. Демонстрационные модели опорно-двигательного аппарата (64-402)
24. Демонстрационные модели дыхательной системы (64-402)
25. Демонстрационные модели органов чувств (64-402)
26. Демонстрационные модели нервной системы (64-402)
27. Видеокамера Microsoft LifeCam Cinema HD (64-402)
28. Стол секционный с мойкой (64-402)

10. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR STUDENTS

Recommendations for preparing for seminars.

The plan for practical classes, their topics, recommended readings, and the purpose and objectives of the course are communicated by the instructor during introductory classes or in the curriculum for the given course. Practical classes help students gain a deeper understanding of the course material and acquire skills in creative work with scientific literature.

Before you begin studying the topic, you need to familiarize yourself with the main questions of the practical lesson plan and the list of recommended literature.

When preparing for a practical lesson, you should first review lecture notes, textbook sections, and teaching aids to gain a general understanding of the topic's place and significance in the course being studied. Then, consult additional literature and take notes on the recommended sources.

In the process of studying the recommended material, it is necessary to understand the structure of the topic being studied, identify the main points, follow their logic and thereby delve into the essence of the problem being studied.

It is necessary to keep records of the material being studied in the form of notes, which, along with visual memory, also includes motor memory and allows for the accumulation of an individual fund of auxiliary materials for the rapid repetition of what has been read, for the mobilization of accumulated knowledge

Basic note-taking forms: outline (simple and detailed), excerpts, and abstracts. During preparation, it is important to compare sources, consider the material being studied, develop an action plan, and carefully consider your oral presentation.

Recommendations for preparing for the test.

Test – 10-15-20-25 points. Each question – 1 (2) point.

TOPICS: Specified in each specific section

Answer requirements: A clear, detailed answer (2 points/question) or a choice of the correct answer to the test question (1 point/question).

Recommendations for preparing for a test/exam

Response requirements and evaluation criteria:

An "excellent" grade of 45-50 points on a test/exam is awarded for: a correct, complete, and logically constructed answer; the ability to use specialized terminology; the ability to illustrate theoretical principles with practical material.

A "good" grade of 35–44 points on the exam is awarded for: a correct, complete, and logically constructed answer with minor errors or inaccuracies; the ability to use specialized terminology, but incomplete conclusions or generalizations are made.

A “satisfactory” grade of 30–34 points on the exam is given for: a schematic, incomplete answer; inability to use special terms or ignorance of them; with one serious error;

An "unsatisfactory" grade of <30 points on the exam is given for: answering all questions on the ticket with serious errors; inability to use specialized terminology; inability to give examples of the practical use of scientific knowledge.

Admission to the exam in a discipline is granted based on a score of over 30 points.

A student can earn between 30 and 50 points per semester.

The minimum score for an exam answer is 30, the maximum is 50.

11. EDUCATIONAL AND METHODOLOGICAL RECOMMENDATIONS FOR TEACHERS

Grading and criteria for tests, extended quizzes, homework, and the final test:

1) - Tests are graded according to the following formula: 1 point for every 1 correct answer. A student who has not started the test receives -1 point.

2) - Extended quizzes are graded according to the following formula: complete answer -2 points, incomplete answer -1 point, no answer -0 points, student who has not started the test -2 points.

3) - Homework must be completed by all students to be eligible for the final assessment. Late submissions will result in a deduction of -1 point from the final score.

4) - Presentation report grading criteria. Conversion from a 100-point to a 10 (5)-point system

5) - Essay evaluation criteria. Maximum 10 points. May be upgraded to a 5-point system.

10 points are awarded if all essay writing requirements are met: the problem is identified and its relevance justified, a brief analysis of the issue is provided and a logically presented personal position is presented, conclusions are formulated, the article is fully analyzed, the length is maintained, and formatting requirements are met.

9 points are awarded if the following essay writing requirements are met: the problem is identified and its relevance justified, a brief analysis of the issue is provided and a logically presented personal position is presented, conclusions are formulated, the article is fully analyzed, but the length is not maintained and formatting requirements are not met.

8 points - the main essay requirements are met, but some shortcomings are present. In particular, there are inaccuracies in the presentation of the material; there is a lack of logical consistency in the judgments; The abstract's length is not maintained; there are omissions in the formatting.

7 points – the basic abstract requirements are met, but the following shortcomings are present: there are inaccuracies in the presentation of the material; there is a lack of logical consistency in the judgments; conclusions are not formulated, the abstract's length is not maintained; there are omissions in the formatting.

6 points – there are significant deviations from the abstracting requirements; the topic is only partially covered; there are factual errors in the abstract's content, conclusions and a personal point of view on the problem are missing.

5 points – there are significant deviations from the abstract requirements: the topic is only partially covered; there are factual errors in the presentation of materials and methods, conclusions and a personal point of view on the problem are missing, the format is not maintained.

4 points – there are significant deviations from the abstract requirements: the relevance of the topic is not disclosed; Factual errors were made in the presentation of materials and methods, conclusions and personal perspective on the problem are missing, and the format is not followed.

3 points – there is no analysis of the relevance of the research topic, approaches, and methods used, although the formal length of the abstract is met.

2 points – the abstract topic is not covered, revealing a significant misunderstanding of the problem. However, the abstract length and formal requirements are met.

1 point – the abstract topic is not covered, revealing a significant misunderstanding of the problem.

0 points – the student did not submit an abstract.

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