



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal state autonomous educational institution  
of higher education  
«Far Eastern Federal University»  
(FEFU)

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**SCHOOL OF BIOMEDICINE**

«AGREED»

Head of education program  
«General medicine»

  
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(signature) Khotimchenko Yu.S.  
(Full name)  
«09» of July 2019

«APPROVED»

Director of the Department of Clinical  
Medicine

  
\_\_\_\_\_  
(signature) Geltser B.I.  
(Full name)  
«09» of July 2019



**WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)**

**«Human Anatomy»**

Educational program

Specialty 31.05.01 «General medicine»

**Form of study: full time**

year 1,2 semester 1,2,3  
lectures 54 hours  
practical classes 198 hours  
laboratory works not provided  
total amount of in-classroom work 252 hours  
independent self-work 153 hours  
including exam preparation 135 hours  
control works ()  
credit not provided  
exam 1,2 year, 1,2,3 semester

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

Author: prof. Usov V.V.

The work program of the discipline "Human Anatomy" was developed for 1st and 2nd year students in 1st, 2nd and 3rd semesters in the direction of 05/31/01 - General Medicine, a form of training. Discipline is included in the Basic disciplines block, the capacity is 540 hours, 15 credit units (252 hours of classroom work, 153 hours of IWS, including 135 hours for preparing for the exam).

The work program was compiled in accordance with the requirements of the federal state educational standard of higher education (level of training specialty), approved by order of the Ministry of Education and Science of the Russian Federation of 09.02.2016 No. 95.

The discipline "Human Anatomy" is the basis for the study of subjects - Pathological anatomy, all clinical disciplines related to the diagnosis and treatment of patients. all clinical subjects involved in diagnosis and treatment of patients.

**The purpose of Anatomy** is: formation of students' knowledge about the structure of the human body, its organs and systems based on contemporary methods of research; Ability to use the knowledge gained in the subsequent study of other basic and clinical subjects, as well as in the future professional activity of the doctor.

**Course objectives are:**

1. To form students' understanding of the purpose, objectives and methods of human anatomy, their importance in the practice of a doctor.
2. To study the relationship of human organs considering age, gender and individual characteristics of the human body;
3. To study the interdependence of structure and form of organs with their functions;
4. To figure out regularities of body constitution and its constituent parts.

For successful study, of course "Human Anatomy" in students following preliminary competences must be formed:

To be able for logical and correct articulating their thoughts using specific terms;

To be able to construct a holistic, coherent and logical statements competently using of anatomical terms;

To work for creation of projects, portfolios, presentations;

To engage in research under the guidance of a professor,

To work with additional literature.

To master the simplest methods of studying of the surrounding world; To be able to see and understand the world, to guide in it (to ask themselves and others question "why?", "why for?", "what's the matter?").

Because of studying the discipline the students form following general professional and special professional competences:

<b>Code and formulation of competence.</b>	<b>Stages of formation of competence</b>	
the capacity for the assessment of morphological and physiological states and pathological processes in the human body for solving professional tasks (GPC – 9)	<b>Know</b>	<ul style="list-style-type: none"> <li>- methods of of anatomic researches and anatomical terms (Russian and Latin);</li> <li>-general patterns the human body structure, the structural and functional relationships of body parts</li> <li>-traditional and modern methods of anatomical studies;</li> <li>- anatomical and topographical relations of organs and body parts in the adult, children and adolescents;</li> <li>- main details of the structure and topography of organs, their systems, their basic functions at different ages;</li> <li>- possible options for the structure, main anomalies and malformations of organs and their systems.</li> </ul>
	<b>Can</b>	<ul style="list-style-type: none"> <li>- to seek out and show on anatomic preparations bodies and parts, structural details;</li> <li>- orientate to the topography and the details of the structure of bodies for anatomical preparations</li> <li>- correctly to call organs and their parts on</li> </ul>

		<p>the Russian and Latin</p> <p>- find and show on radiographs organs and the basic details of their structure;</p> <p>- find and out feelers on the body of a living person the basic bone and muscle benchmarks applied projection of the major neurovascular bundles of the human body areas</p>
	<b>Master</b>	- medical and anatomical conceptual apparatus

To form the competencies in the academic course "Human Anatomy" following the methods of active / interactive learning are used:

1. There is provided carrying out a practical training with use of the computer training programs, works with moulages and phantoms, with analysis of clinical cases.
2. For the organization of independent work preparation of papers and reports for a presentation in class and at a student's conference is offered; as well as preparation for a laboratory and practical classes, work with additional literature, lesson- conference.

The practical training given in interactive forms takes 10% of classroom time; and independent out-of-class work – 42% of time.

# **I. STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE (54 HOURS)**

## **FIRST SEMESTER (18 hours)**

### **Section I. General theoretical foundations of morphology (4 hours)**

#### **Lecture 1. Introduction to human morphology. Contents and objectives of morphology (2 hours)**

Development of morphology: brief historical review and main stages of development. Garvey's discovery of a closed circle of blood circulation and Descartes's - a reflex. Origins of electrophysiology (Galvani and Volta), development in the 19th century. Development of morphology in Russia.

#### **Lecture 2. Principles of the systemic organization of the human body. (2 hours)**

The organism as a whole formation. Planes and axes. General terms. Ontogenetic formation of physiological functions. Object and methods of research in anatomy. Prenatal ontogenesis. Postnatal ontogenesis

### **Section II. Osteology. (4th hour)**

#### **Lecture 3. Passive part of the musculoskeletal system. Functional morphology of a passive part of the musculoskeletal system. The solid bone skeleton. Bone as body. The bones of the body. (2 hours)**

Classification of bones by a form (structure), development and functions. General regularities of forming of bones. Influence of various factors on development of a bone. Bone as a living organism. Structure of vertebrae. Features of the structure depending on the region of the vertebral column.

#### **Lecture 4 Functional morphology of the passive part of the musculoskeletal system. Bones of free extremities (2 hours)**

The bones of the shoulder girdle and features of their structure. Brachial bone. Ulna and radius of the forearm. Bones of hand.

### **Section III. Craniology (4th hour)**

**Lecture 5. Functional morphology of a passive part of a musculoskeletal system. Anatomy of a cerebral skull. (2 hours)**

Human skull (Latin - cranium) - set of bones of a head framework. Skull and its parts: facial and cerebral (cranium).

Occipital bone (os occipitale) unpaired. Clinoid bone (os sphenoidale) unpaired. In the clinoid bones having irregular shape allocate a body, small wings, larger wings and pterygoid processes. Temporal bone (os temporale) paired.

**Lecture 6. Functional morphology of a passive part of a musculoskeletal system. Anatomy of a facial skull. (2 hours)**

Bones of facial part of a skull are located under cerebral part.

Top jaw (maxilla) paired.

Lower jaw (mandibula). Palatal bone (os palatinum) paired. The lacrimal bone (os lacrimale).

**Section IV. Arthrosyndesmology (2 hours)**

**Lecture 7. Functional anatomy of a passive part of a musculoskeletal system. Arthrosyndesmology. (2 hours)**

Concept about an arthrosyndesmology. Arthron - joints, syn – together, a desma – ligaments, therefore, an arthrosyndesmology is a doctrine about joints and ligaments.

Classification of joints by a form and axes of the movement. The complex and combined joints. Additional joint formations. Hemiartroses. Synarthroses.

**Section V. Myology (4 hours)**

**Lecture 8. Functional morphology of an active part of a musculoskeletal system. Muscular system. (2 hours)**

Concept of muscular system. Difference of smooth (non-striated) muscles from striated muscles. Muscles antagonists and synergists. 'Auxiliary apparatus of muscles.

**Lecture 9. Functional morphology of the active part of ODA. Skeletal musculature. Basics of muscle biomechanics. (2 hours)**

The concept of biomechanics. Abdominal muscles. Weaknesses in the anterior abdominal wall. The muscles of hip and pelvis. The muscles of the shin. The topography of the pelvis, thigh, shin. Active tightening of the foot.

## **SECOND SEMESTER (18 hours)**

### **Section VI. Splanchnology. (12 hour)**

#### **Lecture 10. Introduction to splanchnology. (2 hours)**

Concept about internal organs. Organs of the thoracic cavity. Organs of a small pelvis. Topography: golotopy, skeletopy, syntopy. Lines of a thorax. Areas of a stomach

#### **Lecture 11. Functional anatomy of respiratory system. (2 hours)**

Respiratory tracts. Top respiratory tracts: nasal cavity, nasopharynx and oropharynx. Lower respiratory tracts: larynx, trachea, bronchi, intra pulmonary bifurcations of bronchi. Bronchial tree. Alveolar tree.

#### **Lecture 12. Functional anatomy of the digestive system. Functional anatomy of the peritoneum (2 hours)**

Oral cavity. Teeth. Formula of teeth. Esophagus. Anatomical and physiological narrowing (tightening) of the esophagus. Stomach. Small intestine. Parts of large intestine (colon). Digestive glands: salivary, liver, pancreas. The structural features of the peritoneum. Organs covered intraperitoneally, mezoperitoneally, extraperitoneally.

#### **Lecture 13. Functional anatomy of a urinary system. Functional anatomy of a male reproductive system. Male perineum (2 hours)**

Urinific organs. Uriniparous organs. External male genitals: penis, scrotum. Internal male genitals: testicle, epididymis, prostate, seminal vesicles, vas deferens (ductus deferens). Perineum.

#### **Subject 14. Functional anatomy of a female reproductive system. Female perineum (2 hours)**

External female genitals: pubis, vulvar lips, clitoris, vagina, hymen. Internal female genitals: ovaries, uterine tubes, uterus. Anomalies of development

**Lecture 15. Development of the urogenital organs. Functional anatomy of the endocrine organs. (2 hours)**

Segmental legs (nephrotomes). Nephrogenic cord of intermediate mesoderm. Cells of mesenchyma and ventral mesoderm.

**Lecture VII. Angiology. (6 hours)**

**Subject 16. Introduction to Angiology. Functional anatomy of the heart. (2 hours)**

Classification of vessels. The topography of the heart. The structural features of the endocardium, myocardium, pericardium, heart valves. Cardiac conduction system. Blood supply and innervation of the heart.

**Lecture 17. Functional morphology of arterial system. Functional morphology of venous system. (2 hours)**

Classification of arteries. The arteries of the aortic arch. The carotid arteries. The descending part of the aorta. Common iliac artery. Arterial anastomosis. Collateral circulation. Superior vena cava. Inferior vena cava.

**Lecture 18. Functional anatomy of lymphatic and immune systems. Functional morphology of a microcirculatory bed. (2 hours)**

Central organs of immune system. Peripheral organs of immune system. The structure of the lymph node. Groups of lymph nodes. Lymphangions.

**THIRD SEMESTER (18 hours)**

**Section VIII. Structure of a nervous system. (18 hours)**

**Lecture 19. Introduction to neurology. Functional anatomy of a spinal cord. (2 hours)**

Structure of a nervous cell. Types of nervous cells. Classification of a nervous system. Topography of a spinal cord. External structure of a spinal cord. Internal structure of a spinal cord. Reflex arch. Segment of a spinal cord. The spinal conductive tracts.

**Lecture 20. Functional anatomy of a brain. (2 hours)**



Parts of a brain. Structures of rhombencephalon. Structures of a mesencephalon. Structures of diencephalon. Structures of telencephalon

**Lecture 21. Functional anatomy of the analyzers. (2 hours)**

The concepts of the receptors. Exteroreceptors. Interoceptors. Proprioceptive sensitivity. interoceptive sensitivity.

**Lecture 22. Functional anatomy of sense organs. (2 hours)**

Organ of vision: eyeglobe, subsidiary bodies of an eye. External ear, middle ear, inner ear. Vestibulocochlear organ. Olfactory (smelling) system.

**Lecture 23. Morphological bases of vital activity of a nervous system (2 hours)**

Limbic system. Reticular formation. Blood supply of a brain. Hematoencephalic barrier.

**Lecture 24. Functional anatomy of a peripheric nervous system. Spinal nerves. Plexuses: cervical, brachial, lumbosacral. (2 hours)**

Somatic peripheric nervous system, common concepts. Formation of a cervical plexus. Main nerves and area of innervation. Formation of a brachial plexus. Radial nerve. Ulnar nerve. Median nerve. Formation of the Lumbar plexus and area of innervation. Formation of a sacral plexus. Sciatic nerve.

**Lecture 25. Functional morphology of the cranial nerves. I-VI (2 hours)**

The formation, topography and innervation area of the olfactory, optic, oculomotor, block, trigeminal and abducens nerves.

**Lecture 26. Functional morphology of VII-XII cranial nerves. (2 hours)**

Formation, topography and area of an innervation of the facial, vestibulocochlear, glossopharyngeal, vagus, accessory, sublingual (hypoglossal) nerves.

**Lecture 27. Functional anatomy of a vegetative (autonomous) nervous system. Development of a nervous system and sense organs. (2 hours)**

Features of topography, formation and area of an innervation of a sympathetic nervous system. Features of topography, formation and area of an innervation of a parasympathetic nervous system.

## **II. STRUCTURE AND CONTENT OF PRACTICAL COURSE**

**Classes (198 hours)**

**The First Semester (72 hours.)**

**Lesson 1: The organization of educational process at the department.**

**Anatomical terminology. Axis and the plane of the human body. (2 hours)**

1. The axes and planes.
2. Anatomical Terminology.
3. Classification of the bones, their difference in form, structure, development.
4. Bone as an organ.

**Lesson 2: Functional anatomy of the skeleton of the trunk. (2 h.)**

1. The skeleton of the trunk.
2. Bones of the axial skeleton. The vertebral column.
3. The structure of a typical (thoracic) vertebrae.
4. Features of the structure of the vertebrae in different parts the vertebral column (cervical, thoracic, lumbar, sacrum and coccyx).
5. The ribs and sternum.

**Lesson 3. Functional anatomy of bones of a shoulder girdle and bones of a brachium (2 hours)**

1. Structure of bones of a shoulder girdle.
2. Features of a structure of a scapula.
3. Clavicle structure.
4. Structure of a humeral bone
5. Diaphysis, apophysis metaphysis, epiphysis.

**Lesson 4: Functional anatomy of the forearm and hand. (2 hours)**

1. The structure of the ulna
2. Structure of the radius.
3. Hand and its partts.
4. Characteristics of the wrist bones.
5. Characteristics of the metacarpus.

**Lesson 5: Functional anatomy of the pelvis (2 hours)**

1. Pelvic bone, its position on the skeleton.
2. Acetabulum.
3. Iliac, the ischial pubic bones.
4. The body, wing, iliac crest.
5. The branches of the pubic bone, symphyseal surface.
6. The body of the ischium, the obturator foramen.

**Lesson 6: Functional anatomy of the free lower limb and foot skeleton (3 hours)**

1. Femur, major and minor (big and small) trochanter, intertrochanteric line.
2. Condyles and epicondyles of a femur
3. Tibial bone. Features of a structure of an epiphysis. Tuberosity of a tibial bone. Medial malleolus.
4. Fibular bone. Lateral malleolus.
5. Skeleton of the foot. Talus (anklebone) and its surfaces. The heel bone (calcaneus) and talus (anklebone).
6. Tarsus, metatarsus, the phalanges of toes.

**Lesson 7. Report on specimens of bones of a trunk and extremities.**

**Intermediate control: testing, interview, case study. (2 hours)**

[https://www.youtube.com/watch?v=TThe\\_36AxJc](https://www.youtube.com/watch?v=TThe_36AxJc)

1. Structure of tubular bones
2. Distinctive features of cervical, thoracic and lumbar vertebrae.
3. Costal arch. What is it formed by?
4. Scapula (shoulder blade) structure.
5. Structure of a humeral bone.
6. Structure of an ulnar bone.
7. Radial bone. Structure of an epiphysis.
8. Parts of a hand.
9. To list and show wrist bones.
10. The structure of the pelvis.
11. To find a major trochanter.

12. Structure of a tibial bone.
13. Parts of talus (anklebone) and calcaneuses (heel-bone).
14. To connect a rib to vertebrae.
15. To connect a clavicle to a scapula (shoulder blade) and a breastbone (sternum).

**Lesson 8. Functional anatomy of a skeleton of the head: the overview of bones of a skull, a bone of cerebral division – occipital, frontal. (2 hours)**

1. Head skeleton. Functions of head skeleton.
2. Cerebral skull or neurocranium
3. Calvaria or cranial vault.
4. Cranial base or floor.
5. Frontal bone. Four parts of a frontal bone. Supraorbital margin, supraorbital foramen or supraorbital notch, superciliary arches, frontal sinuses.
6. Occipital bone, its parts. Sulcuses of the superior sagittal and transversal sinuses.

**Lesson 9. Functional anatomy of the skeleton of the head - the sphenoid, temporal bone. (2 hours)**

1. Sphenoid bone and its parts.
2. The body of the sphenoid bone, pneumatic sinuses (sinus sphenoidalis).
3. The foramina and canals of sphenoid bone (foramen rotundum, foramen ovale, foramen spinosum, foramen venosum, foramen petrosum, canalis opticus, canalis pterygoideus).
4. The temporal bone and its parts (petrous part, tympanic part, squamous part).
5. The pyramid of the temporal bone. The canals of the temporal bone (carotid canal, facial canal, musculotubal canal). Processes of the temporal bone (mastoid, zygomaticus, styloid).

**Lesson 10: The bones of the cerebral part of skull - ethmoid, parietal. (2 hours)**

1. Ethmoid bone. Its participation in the formation of the orbit (the eye socket).
2. The cells of the ethmoid bone. Lamina cribrosa (cribriform lamina).  
The parietal bone.

### **Lesson 11. Functional anatomy of the facial bones of the skull. (2 hours.)**

1. The upper jaw parts (maxillary bone, maxilla), surfaces (anterior, orbital, infratemporal, nasal), processes (frontal, zygomaticus, alveolar, palatine).
2. The maxillary sinus.
3. Lower jaw ([mandibular bone](#), mandible, mandibula): the body, branches, processes, foramens and canals.
4. Palatine bone.
5. The zygomatic bone, its processes.
6. The nasal bone.
7. Vomer.
8. The lachrymal bone.

The hyoid bone

### **Lesson 12. Functional anatomy of the skull as a whole - cranial fossae, base of the skull. (2 hours)**

1. The anterior cranial fossa.
2. The middle cranial fossa
3. The posterior cranial fossa.

Foramens and passages of skull base

### **Lesson 13. Functional anatomy of the skull as a whole - the temporal fossa, pterygopalatine fossa. (2 hours)**

1. The temporal, inferior temporal fossa.
2. The pterygopalatine fossa: boundaries, walls, passages.
3. Features of the structure of the skull of the newborn.

### **Lesson 14. Functional anatomy of the skull as a whole - eye socket (orbit), nasal cavity. (2 hours)**

1. The structure of the nasal cavity, the nasal septum.

2. The nasal meatuses and their communications.
3. The walls of the eye socket.

Passages of the eye socket

**Lesson 15. Report on preparations bones and skull topography. Testing, interview, case study. (2 hours)**

1. Show the border between the calvaria (cranial vault) and cranial base (cranial floor.)
2. Limits, parietes and fenestration of anterior cranial fossa (fossa cranii anterior ).
3. The limits, parietes, fenestration of the middle cranial fossa (fossa cranii media ).
4. The limits, parietes, fenestrations of the posterior cranial fossa (fossa cranii posterior).
5. The parietes, fenestrations of the eye socket (orbit).
6. The parietes of the nasal cavity (cavum nasi ).
7. Nasal passages and its fenestrations.
8. Hard palate
9. The parietes, fenestrations of the temporal bone (os temporale).
10. The parietes, fenestrations of the pterygopalatine fossa (fossa pterygopalatina)
11. Sutures and fontanelles of the skull of newborn

**Lesson 16. Introduction to artrosyndesmology. Types of joints. Functional anatomy of the bone joints (articulations) of the body. (2 hours)**

<http://www.proko.com/types-of-joints/>

1. List types of synarthrosis.
2. Biomechanics of the joints.
3. Classification of joint shapes
4. The structure of intervertebral disc
5. The junction between the sacrum and the coccyx.
6. Ribs junctions with the vertebrae

**Lesson 17. Functional anatomy of the head bone. (2 hours)**

1. Junctions of the cranial bones.
2. Types of skull sutures.
3. Features of the skull bones connections in newborns.
4. The structure of the temporo-mandibular joint.

**Lesson 18. Functional anatomy of the bone joints of the shoulder girdle and upper limb free. (2 hours)**

1. Sternoclavicular joint.
2. Acromioclavicular joint.
3. The glenohumeral joint (shoulder joint).
4. The elbow joint and joints included in it: brachioradialis, humeroulnar proximal radioulnar.

**Lesson 19. Functional anatomy of the wrist bone. (2 h.)**

1. The joints of the wrist.
2. Metacarpus joints.
3. The joints of the finger phalanges.

**Lesson 20. Functional anatomy junctions of the pelvic bones and the lower limb. (2 hours)**

1. The junctions of the pelvic bones.
2. The anatomical features of the female pelvis.
3. The sacroiliac joint
4. The junctions of the pubic bone.
5. The linea that separates the greater from the lesser pelvis.
6. The pelvis as a whole
7. The age differences of the pelvis.
8. The hip joint.
9. The knee joint.
10. Junctions of leg bones

**Lesson 21. Functional anatomy of joints of the foot bones. (2 hours.)**

1. Ankle joint

2. Talo-navicular joint (Chopart joint).
3. "Key" Chopart joint.
4. Tarsometatarsal joints (Lisfranc)
5. The arches of the foot.

**Lesson 22. Report on preparations of bone joints. Testing, interview, case study. (2 hours)**

1. Types of joints and functions (synarthrosis – immovable; amphiarthrosis – slightly movable; diarthrosis – freely movable).
2. Synarthrosis (immovable) joints, classification, structure, features of function.
3. Diarthrosis (freely movable) joints, classification, structure, features of function.
4. Structure of joints
5. Obligatory elements of the joints.
6. Auxiliary elements of joints.
7. Differences between synarthrosis and diarthrosis.
8. Features of shape and function of the joints.
9. Fundamentals of joint kinematics.
10. Junctions between the vertebrae. Movement of the vertebral column.
11. Atlanto-occipital joint.
12. Vertebral column as a whole, its departments, flexures. Formation of flexures in ontogenesis.
13. The structure of the temporo-mandibular joint
14. Junction ribs with the vertebrae and sternum.
15. Thoracic cage (thorax) as a whole
16. The glenohumeral joint (shoulder joint), structure, shape and movements.
17. The elbow joint structure, shape and movements.
18. Junctions of the forearm bones.
19. Hand joints.
20. Junctions of the pelvis. Pelvis as a whole.



21. Age and gender peculiarities of pelvis. The dimensions of the female pelvis.
22. Hip joint, structure, shape and movements
23. Knee joint, structure, shape and movements
24. Joints of foot, structure, shape and movements
25. The arches of the foot.

**Lesson 23. Introduction to myology. Mimic and masticatory muscles. (2 hours)**

1. Mimic muscles: muscles of the cranial vault, the muscles surrounding the nasal opening, the muscles surrounding the mouth slit, the muscles surrounding the eye slit (extraocular), the ear muscles.
2. The chewing muscles

**Lesson 24. The muscles of the neck. (2 hours)**

1. The muscles of the neck: superficial muscles (suprahyoid (mm suprahyoidei) and sublingual (mm infrahyoidei))
2. The deep muscles of the neck (lateral and prevertebral group).

**Lesson 25. The fascia of the head and neck. Interfascial neck area. (2 hours)**

1. Triangles of the neck.
2. Fascia and interfascial space.

**Lesson 26. The muscles and fascia of the back. (2 hours)**

1. Superficial muscles of the back (dorsum).
2. The deep muscles of the back.
3. Fascia of the back

**Lesson 27. The muscles and fascia of the chest. Diaphragm. (2 hours)**

[Http://www.medknigaservis.ru/anatomiya-cheloveka-uchebnoye-posobiye-studentov-meditsinskikh-vuz-sapin-kolesnikov.html](http://www.medknigaservis.ru/anatomiya-cheloveka-uchebnoye-posobiye-studentov-meditsinskikh-vuz-sapin-kolesnikov.html)

1. The muscles of the chest.
2. The auxiliary apparatus of the chest muscles.
3. The structure of the diaphragm

**Lesson 28. The muscles of the abdomen. The vagina of the rectus abdominis muscle. (2 hours)**

<https://www.youtube.com/watch?v=5dl5rbttbrg>

1. The muscles of the lateral abdominal wall.
2. The muscles of the anterior abdominal wall.
3. The muscles of the posterior abdominal wall.
4. Vagina of rectus abdominal muscles above and below the navel (umbilicus, omphalon)

**Lesson 29. Linea alba. Umbilical ring. Inguinal canal. Lines and regions of the anterior abdominal wall. (2 h.)**

1. Regions of the abdomen area.
2. The structure of the linea alba
3. The walls of the inguinal canal.

The weak places of anterolateral abdominal wall

**Lesson 30. The muscles and fascia of the shoulder girdle and humerus (brachium) (2 hours)**

[http://www.medicalook.com/human\\_anatomy/organs/Brachium.html](http://www.medicalook.com/human_anatomy/organs/Brachium.html)

<http://present5.com/prezentaciya-gajvoronskij-lekcija-11-myshev-konechnostej/>

1. Muscles of the shoulder girdle.
2. Deltoid muscle.
3. Supraspinatus, infraspinatus muscle.
4. Teres muscles of the shoulder girdle .
5. The anterior group of shoulder muscles - flexors.
6. The posterior group of shoulder muscles - extensors.
7. Axillary fossa: its walls, openings and their contents. Canal of the radial nerve.
8. Sulcus bicipitalis medialis
9. Radial nerve canal (canalis humeromuscularis).

**Lesson 31. The muscles and fascia of the forearm. (2 hours)**

<https://www.youtube.com/watch?v=QYbDlxJ-DJM>

1. The anterior of the forearm muscle group.
2. The posterior of the forearm muscle group.
3. The [cubital fossa](#).
4. The radial, ulnar, median sulci of forearm.

**Lesson 32. The muscles and fascia of the hand. Topography of the upper limb.**

**(2 hours)**

1. Muscles of thenar eminence
2. The middle hand muscle group.
3. Muscles of hypothenar eminence
4. Synovial membranes (synovium or stratum synoviale) of hand.

**Lesson 33. Muscles, fascia and the topography of the pelvic girdle and thigh.**

**The femoral canal. (2 hours)**

1. The boundaries of the gluteal region.
2. Muscles of superficial, middle and deep layers of the gluteal region.
3. The anterior thigh muscles.
4. The medial and posterior group of thigh muscles.
5. The walls of the femoral triangle.
6. Deep and superficial foramina of the femoral canal.
7. Greater sciatic foramen.
8. Super- subpiriforme foramina
9. The muscular and vascular lacunae.

**Lesson 34. Muscles, fascia and the topography of the leg and foot. (2 hours)**

1. Muscles of anterior group of the tibia
2. Muscles of lateral group of the tibia.
3. Muscles of posterior group of the tibia.
4. The structure of the popliteal fossa.
5. Crural popliteal canal (Gruber's).
6. The upper and lower musculo-fibular canals (canalis musculoperoneus superior, canalis musculoperoneus inferior).
7. Superficial and deep muscles of the back (dorsum) of foot.
8. The medial, middle, lateral muscle group of the planta.
9. The medial and lateral plantar sulci.
10. Active tightening of the arches of the foot

**Lesson 35. The final seminar on myology. Testing, interview, the decision of case studies (2 hours)**

1. Auxiliary apparatus muscle.
2. The muscles synergists, agonists, antagonists. Give examples.
3. The muscles involved in movements of the upper limb girdle around vertical axis.
4. Muscles raising and lowering upper limb girdle, choose exercises for their development.
5. The muscles involved in the rotation of the shoulder blade (capula).
6. The muscles involved in the abduction, adduction, pronation and supination of the shoulder.
7. Axillary (axillary) cavity, its walls.
8. Fasciae of shoulder.
9. The muscles involved in flexion and extension of the shoulder.
10. The muscles involved in flexion and extension of the forearm.
11. Sulcuses of the forearm.
12. The muscles involved in pronation and supination of the forearm.
13. Cubital fossa.
14. Flexion and extension of the hand and fingers.
15. Abduction and adduction of the hand.
16. Fasciae and typography of the upper limb muscles.
17. The muscles involved in flexion and extension of the thigh.
18. The femoral triangle and femoral sulcus.
19. The movement of the thigh (femur) and shin (tibia) around a vertical axis. Analysis of muscle's condition when performing these movements.
20. Muscles involved in flexion and extension of shin and foot.
21. Cruropopliteal canal (canalis cruropopliteus) (Gruber's).
22. The muscles involved in the abduction and adduction, supination, pronation of the foot.

23. The arches of the foot, their firming machine.
24. Adductor canal.
25. Topography of the lower limb muscles, the projection of the muscles on skin.
26. The muscles involved in the extension of the spinal column.
27. The muscles involved in flexion of the spinal column. Choose the exercises to develop them.
28. The muscles and fascia of the back, their function, age features.
29. The muscles involved in the act of inhalation.
30. The muscles involved in the act of exhalation.
31. Superficial muscles of the neck muscles and the hyoid bone.
32. The deep muscles of the neck.
33. Fasciae of the neck. Topography of the neck muscles.
34. Weak points the anterior abdominal wall.
35. Mimic and masticatory muscles.
36. Linea alba. The vagina is the rectus abdominis muscle.
37. Inguinal and femoral canals.
38. The muscles of the pelvis: the beginning, attachment, function.

**Lesson 36. The final semester seminar. Midterm examination: testing, interview, the decision of case studies. (2 hours)**

1. Classification of the body skeleton.
2. Structural and functional unit of bones.
3. Classification of the head skeleton.
4. Classification of bone joints.
5. The structural and functional unit of muscle tissue.

**Second Semester (72 hours)**

**Lesson 1: Functional anatomy of the respiratory system: nasal cavity, pharynx and larynx. (4 hours)**

1. The structure of the external nose.

2. The upper, middle and lower nasal passages (meatuses). Choanae.
3. Paranasal sinuses.
4. The structure of the larynx. The cartilage of the larynx. Parts of the larynx.
5. The muscles of the larynx. Communications of the pharynx and larynx.

## **Lesson 2: functional anatomy of the trachea, bronchi and lungs. Pleura.**

### **Mediastinum. (4 hours)**

1. Structure of the trachea.
2. Skeletopy and syntopy of trachea.
3. Bronchial tree.
4. The structure of the bronchioles.
5. Alveolar tree.
6. Lobes, segments, acini of the lung.
7. The pleura. Pleural cavity.

## **Lesson 3: Report on the preparations of the respiratory system. Testing, interview, the decision of cases. (4 hours)**

1. Larynx: cartilages, structure, gender features of the larynx. The muscles of the larynx. Glottis.
2. The characteristic features of the structure in children.
3. The trachea and bronchi, bronchi branching.
4. Lungs: the internal structure.
5. Lungs: external structure. Morfo-functional features of the lungs in children.
6. The boundaries of the lungs.
7. The pleura, pleural cavity and sinuses.
8. The boundaries of the pleura. Mediastinum.

## **Lesson 4: Functional anatomy of the digestive system: oral cavity and pharynx, esophagus anatomy, the stomach and intestines. (4 hours)**

1. Oral cavity: walls, content, pharynx. Age features of teeth structure.

2. The salivary glands.
3. Tongue, its structure.
4. Throat: part of the structure of the walls, communication, topography.
5. Esophagus: structure, topography.
6. Stomach: topography, walls, parts of its sphincters.
7. The structure of the small intestine and its parts.
8. Features of the structure of the duodenum.
9. Parts of the colon. Ileocecal angle.
10. Features of the rectum structure.

**Lesson 5: Functional anatomy of the liver and pancreas. Abdominal cavity, abdominal cavity and retroperitoneal space. Peritoneum. Peritoneal cavity (4 hours)** [https://www.youtube.com/watch?v=uo3jdaxr\\_wv](https://www.youtube.com/watch?v=uo3jdaxr_wv)

1. Liver: surface, edge, lobes.
2. The structure and the ducts of the gallbladder.
3. Topography and parts of the pancreas.
4. The walls of the abdominal cavity.
5. Ligaments of peritoneum.
6. Mesentery and its root.
7. Intra-, meso and extraperitoneal organs covered with peritoneum.
8. Levels and regions of the abdominal cavity.
9. Flanks, sinuses of the abdominal cavity, peritoneal recesses (or peritoneal gutters)
10. Greater and lesser omenti

**Lesson 6: report on the preparations of the digestive system. Testing, interview, solving of cases (4 hours)**

1. The vestibule of the mouth. The structure of the lips, cheeks, gums.  
Glands associated with the oral vestibule.
2. Oral cavity proper: the structure of walls, gland opening into the oral cavity.

3. Permanent and deciduous teeth. The dental formula. The structure of the teeth.
4. Throat, structure, function, topography.
5. The tongue, features of mucosa, tongue muscles
6. Esophagus, stomach: structure, topography, age features.
7. The duodenum: topography, the structure of wall, characteristics, relation to peritoneum.
8. Jejunum and ileum, difference between jejunum and ileum.
9. The structure of the bowel wall in childhood.
10. The cecum and the appendix.
11. Rectum: topography, structure, relation to peritoneum.
12. Colon: its parts, difference between large and small intestine.
13. Peritoneal cavities.
14. Characteristics of epigastrium, and mesogastium and hypogastrium.
15. Liver internal structure, functions.
16. Gall bladder, external structure.
17. Paths of excretion of bile.
18. Ligaments of liver, topography, factors influencing the displacement of internal organs.
19. The pancreas: structure, topography, function, microscopic structure.

**Lesson 7: Functional anatomy of excretory organs. (4 hours)**

1. Topography, the structure of the kidney.
2. Features of the structure of the cortical and medullary kidney substances.
3. Pyelocaliceal system.
4. The structure of the nephron. Parts of the nephron, the structural features of the ureter wall.
5. The structure of the bladder.
6. Gender peculiarities of the urethra.



**Lesson 8. Functional anatomy of the male genital organs. Male perineum (4 hours)**

1. The structure of the internal male genitals.
2. Testicle layers (tunicae).
3. The seminal vesicles.
4. The prostate gland.
5. The structure of the penis.

**Lesson 9. Functional anatomy of the female genital organs. Female perineum (4 hours)**

1. The classification of the female genital organs.
2. The structure of the internal female reproductive organs: the ovaries, fallopian tubes, uterus, vagina.
3. The structure of the external female genitals: vulva, clitoris.

**Lesson 10. Functional anatomy of the endocrine system. (4 hours)**

1. General characteristics of the organs of internal secretion. Endocrine part of the sexual glands.
2. Glands: classification, types, structure.
3. Pineal gland, the pituitary gland - structure, function.
4. The thyroid and parathyroid glands: structure, topography, functions
5. Glands of branchial origin: the thyroid and thymus.
6. The pancreas is an organ of internal secretion.
7. Adrenal gland, topography, functions.

**Lesson 11. Report on preparations of urinary system and endocrine glands. (4 hours)**

1. Male reproductive system: the organs, structure, development, function.
2. Testis, epididymis: topography, development, structure, function, layers
3. The prostate gland: topography, development, structure, function.
4. The spermatic cord. Men's external genitals.
5. Female reproductive system: the organs, structure, development, function.

6. Ovary: topography, development, structure, functions.
7. Uterus: topography, development, structure.
8. The vagina; female external genitals.
9. The muscles and fascia perineum.
10. Differences in the structure of the male and female perineum.
11. Endocrine glands: the development, function; anatomical classification of the endocrine glands.
12. Thyroid and parathyroid glands: topography, structure, functions.
13. Adrenal glands: topography, development, structure, functions.
14. The pituitary gland: topography, development, structure, functions.
15. Epiphysis: topography, development, structure, functions.

**Lesson 12. Functional anatomy of the heart. Pulmonary circulation (4 hours)**

1. The surfaces of the heart.
2. Chambers of the heart.
3. Atrioventricular valves, valvular structures.
4. Semilunar valves.
5. The layers of the heart wall.
6. Topography of the heart.
7. The arteries supplying the heart.
8. The nerves carrying sensory, sympathetic, parasympathetic innervation.

**Lesson 13. Functional anatomy of branches of the aortic arch. The branches of the external carotid artery. Functional anatomy of the branches of the internal carotid and subclavian arteries. (4 hours)**

1. Aorta.
2. Three sections of aorta.
3. The branches of the aortic arch: brachiocephalic trunk, left common carotid and left subclavian artery.
4. Topographic features of the right and left common carotid and subclavian arteries.
5. The branches of the external carotid artery.

6. The arterial circle (the willisen circle), the branches of the internal carotid and basilar arteries.

#### **Lesson 14. Functional anatomy of the arteries of the upper limb (4 hours)**

1. Axillary artery, three its parts and branches of each part, the region of blood supply.
2. The boundaries of the tripartite and quadripartite apertures of axillary cavity and their contents.
3. The level of the transition of axillary artery in the brachial artery.
4. Deep brachial artery (arteria brachialis profundus), canalis humeromuscularis
5. The ulnar and radial artery in the forearm, the sulcuses in which they pass.
6. Formation of superficial and deep palmar arches

#### **Lesson 15. Functional anatomy of the descending aorta and iliac arteries.**

##### **Functional anatomy of the arteries of the lower limb (4 hours)**

1. The descending aorta and its sections.
2. Upper diaphragmatic artery.
3. Visceral branches of the thoracic aorta
4. Parietal branches of the abdominal aorta, and diaphragmatic lower lumbar artery.
5. The paired visceral branches of the abdominal aorta.
6. Unpaired visceral branches, celiac, superior mesenteric, inferior mesenteric artery.
7. The right and left common iliac artery and dividing them into external and internal.
8. The branches of the external and internal iliac arteries.

#### **Lesson 16. Functional anatomy of the venous system. Functional anatomy of the lymphatic system (4 hours)**

1. Internal jugular vein (vena jugularis interna).
2. Venous sinuses of the head.

3. Veins of the free upper limb.
4. Lower hollow vein (vena cava inferior).
5. Portal vein and its origins: the upper and lower mesenteric vein, splenic vein. Upper portocaval anastomosis. Lower portacaval anastomosis and outflow of venous blood from the rectum. Cava-caval anastomoses

**Lesson 17. The final session on angiology. (4 hours) Case studies**

1. The drug should be injected into the venous bed. What kind of superficial vein of the upper limb should be used for this manipulation?
2. On examination ophthalmologist found in patient bleeding in the retina. What artery was damaged?
3. The edges of the foramen magnum were displaced due to the injury of bones of the skull base. Which branch of the subclavian artery could be damaged?
4. During operation in cancer of tongue it was necessary to ligate the right lingual artery. At what topographical formation of the neck is supposed to carry out this manipulation?
5. The patient has mitral valve, which does not completely close the left atrioventricular opening. In what direction, will the blood move from the left ventricle during systole?
6. The patient has the tricuspid valve which does not completely close the right atrioventricular opening. In what direction, will the blood move from the right ventricle during systole?

**Lesson 18. The final semester seminar. Midterm examination: testing, interview, the solving of case studies. (4 hours)**

1. The nasal cavity: walls, nasal passages and their communications.
2. Larynx: the structure, parts, elastic cone (epiglottis), vocal and vestibular folds, glottis, topography, structure.
3. The trachea and main bronchi: structure, topography.

4. Lungs: the outer and the inner structure, hilum, the root of lungs, topography.
5. Topography of the visceral and parietal pleura. The cavity of the pleura, pleural sinuses
6. Mediastinum: boundaries, content.
7. The oral cavity: walls, content, pharynx. Tongue, its structure.
8. Pharynx: parts, the structure of the walls, communication, topography.
9. Esophagus: structure, anatomical and physiological narrowing, the topography.
10. Stomach: structure, ligaments, topography.
11. Liver: external structure, grooves, and their content, ligaments. The formation of the portal vein and hepatic veins.
12. Topography of the liver.
13. Gall bladder: the structure. Bile ducts.
14. The pancreas: structure, duct narrowing, the topography.
15. Duodenum: parts, structure, topography. On duodenogram show sections duodenum.
16. Jejunum and ileum: structure, topography.
17. Large intestine: parts, features of the wall structure, topography.
18. Rectum: parts, features of the wall structure, topography.
19. The walls of the abdominal cavity. Retroperitoneal space. Serous membrane of the thoracic cavity.
20. The boundaries of the upper, the lower floors of the abdomen and pelvis.
21. Parts of the peritoneal cavity, the upper, lower pelvic floors: peritoneal sacs (bursae), side grooves, mesenteric sinuses and flanks.
22. Lesser omental sac: walls, epiploic (omental) foramen (of Winslow) and its walls.
23. Kidney: external and internal structure. Nephron scheme.
24. Topography of kidneys.

25. Pyelocaliceal kidney complex. Ureter: parts, narrowing.
26. Bladder: structure, topography. On cystogram find bladder to determine its location and shape.
27. The internal male genital organs: the structure, topography.
28. The testicle and spermatic cord: structure, topography.
29. Ovary: structure, topography.
30. Uterus: structure, topography. X-ray anatomy.
31. Fallopian tubes: structure, topography. X-ray anatomy.
32. Vagina: structure, topography.
33. Endocrine glands: classification. The structure, topography, functions.

### **Third semester (54 hours)**

#### **Lesson 1: Introduction to neuroscience. Functional anatomy of the spinal cord. (3 hours)**

1. Scheme of the simple three neural reflex arc.
2. Spinal cord: a horse tail, thickening segments.
3. Five sections of the spinal cord: cervical (8 segments), thoracic (12 segments), lumbar (5 segments), sacral (5 segments), coccyx (1-2 segments).
4. Rule of Shipo.
5. The gray and white substance of the spinal cord.
6. Meninx of spinal cord and intermeningeal spaces

#### **Lesson 2: Functional anatomy of hindbrain, the isthmus of the brain, midbrain (mesencephalon) (3 hours)**

1. The boundaries of the medulla oblongata.
2. Pyramids and olives. Gentle and wedge-shaped tubercle, the lower leg of the cerebellum and of the rhomboid fossa,
3. The cerebellum and its parts, the worm and the hemisphere.
4. The boundaries of the rhomboid fossa.
5. The structures on the border of middle and hindbrain - isthmus.

6. The upper legs of the cerebellum, the top cerebral sail and triangle lateral loops.

### **Lesson 3: functional anatomy of the diencephalon. (3 hours)**

1. Thalamus.
2. Metathalamus.
3. The hypothalamus.
4. Epithalamus

III ventricle.

### **Lesson 4: functional anatomy of the telencephalon. The basal nuclei. (3 hours)**

1. Cerebral hemispheres.
2. Pallium (cortex cerebri – grey matter)
3. The olfactory brain (Rhiencephalon).
4. The basal ganglia (striatum which consists of the caudate and lenticular nuclei, fuses and amygdala).

Lateral ventricles, corpus callosum and fornix

### **Lesson 5: Telencephalon. Lobes gyri. (3 hours)**

1. Sulci and gyri of the pallium of the telencephalon: the lateral, central and parietal-occipital sulcus.
2. Lobes of the hemispheres - frontal, parietal, temporal and occipital.
3. The boundaries of the temporal lobe, the upper, middle and inferior temporal gyrus

Calcarine sulcus, cingulate gyrus and the rostrum corporis collosi (uncus).

### **Lesson 6: Functional anatomy of the meninges and intermeningeal spaces.**

#### **The circulation of cerebrospinal fluid. (3 hours)**

1. The dura mater.
2. Cerebral falx (falx of cerebrum), tentorium cerebelli, falx of cerebellum, the diaphragm of sella turcica;
3. The upper and lower sagittal sinus, tentorial (straight) sinus, transverse, occipital, cavernous, sigmoid, the upper and lower petrosus sinuses.
4. Cisternae.

5. Arachnoid.
6. Vascular or pia mater.

Outflow tract of cerebrospinal fluid from the lateral ventricles through the interventricular (Monroe's) openings in the III-rd ventricle

**Lesson 7: functional anatomy of the organs of vision, smelling. (3 hours)**

1. Organ of vision consists of eyeballs (oculus or ophthalmos) and auxiliary bodies.
2. The eyeball with optic nerve and tunics.
3. The outer fibrous tunica of bulbus oculus.
4. Three parts of the choroid: the actual vascular, ciliary body and iris.
5. Elements of the inner core of the eye, vitreous, lens.
6. The outer muscles of the eyeball, eye socket fat body, the vagina of the eyeball, cartilage and glands eyelids, eyelashes, conjunctiva and lacrimal apparatus.

Olfactory analyzer

**Lesson 8. Functional anatomy of the taste, the anatomy of hearing and balance. (3 hours)**

1. The gustatory (taste) organ
2. Receptors taste analyzer
3. The outer ear.
4. The middle ear.

The inner ear

**Lesson 9. Functional anatomy pathways. (3 hours)**

1. Pathways of exteroceptive sensitivity.
2. Pathways of proprioceptive sensitivity of cortical direction.
3. Pathways of proprioceptive sensitivity of cerebellar direction.
4. Tractus corticospinalis (pyramidal pathways).
5. Tractus rubrospinalis (extrapyramidal system).
6. Optic pathways.
7. Auditory pathways



## **Lesson 10: the final lesson on the central nervous system and sensory organs.**

**(3 hours)**

1. The outer structure of the spinal cord.
2. Internal structure of the spinal cord.
3. The topography of the spinal cord.
4. The structure of the anterior and posterior spinal nerve roots. The reflex arc.
5. Tunicae and intertunical space of spinal space.
6. Parts of brain. Their boundaries on the ventral and dorsal surfaces.
7. External and internal structure of the medulla oblongata.
8. External and internal structure of the bridge.
9. External and internal structure of the cerebellum. 3 pairs of legs of the cerebellum.
10. IV ventricle. The walls and communication.
11. Rhomboid fossa. The projection of the cranial nerve nuclei in the rhomboid fossa and midbrain.
12. External and internal structure of the midbrain.
13. The structure of the intermediate brain.
14. III ventricle. The walls and communication.
15. Telencephalon. Cortex cerebri. Basic sulci and gyri.
16. The basal nuclei.
17. Identify and show the nuclei of the extrapyramidal system.
18. White matter of hemispheres
19. The olfactory brain.
20. Lateral ventricles. Parts and communication.
21. Tunicae and intertunical brain space.
22. Producing and the circulation of cerebrospinal fluid.
23. Tunicae of eyeball.
24. The inner core of the eye.
25. Auxiliary eyes apparatuses: lacrimal apparatus, muscles, tissue of the orbit, eyelids, conjunctiva.

26. The outer and middle ear.

27. The inner ear

**Lesson 11. I-VI pair of cranial nerves. Nuclei. The exit sites of every nerve from the brain and the skull, and the area of innervation. (3 hours)**

1. The olfactory nerve, its development from the olfactory brain, which evolved under the influence of olfactory receptors
2. The optic nerve.
3. III, VI and VI pairs of cranial nerves, the topography of the nuclei, the exit sites of every nerve from the brain and the skull, and the area of innervation.
4. Trigeminal nerve (V pair). Nuclei of the trigeminal nerve, their projection on the diamond-shaped hole, place of the nerve exit from the brain.

**Lesson 12. VII-XII pair of cranial nerves. Nuclei. The exit sites of every nerve from the brain and the skull, and the area of innervation. (3 hours)**

1. VII pair - two nerves: The Facial and Intermediate. The topography of the nuclei, the exit sites from the brain and the skull, and the area of innervation.
2. The clinical significance of the topographic relationship of the facial nerve with the tympanic cavity (with the possible defeat in otitis), with the parotid gland (the involvement in the inflammatory process in parotitis).
3. VIII pair (vestibulocochlear nerve), nerve nuclei and places of its outlet on the base of the brain.
4. The glossopharyngeal nerve - three kinds of fibers (sensory, motor and autonomic). topography of the nerve nuclei, the place of its outlet from the brain and the skull.
5. Vagus nerve. Topography of the nerve nuclei, places of its exit from the brain and skull.
6. Accessory nerve.
7. Hypoglossal nerve

### **Lesson 13. Spinal nerve, its branches. Cervical plexus. (3 hours)**

1. Cervical plexus, how it is formed.
2. The branches of the cervical plexus - muscle, skin, and mixed nerves.
3. Phrenic nerve

### **Lesson 14. Brachial plexus. The intercostal nerves. (3 hours)**

1. Brachial plexus. How it is formed.
2. Short branches of the brachial plexus: the dorsal nerve of scapula, long thoracic nerve and suprascapular nerves subclavian, subscapular nerve, thoracodorsal nerve, lateral and medial pectoral nerve, axillary nerve and its innervation area.
3. Axillary nerve.
4. Long branches of the brachial plexus.
5. Branches of the lateral fasciculus: musculocutaneous nerve, its location and the area of innervation.
6. The medial fasciculus a) the ulnar nerve, its position on the arm, forearm, its back and the palm branches, the area of its innervation on the forearm and palm, b) the medial cutaneous nerve of arm (medial brachial cutaneous nerve) and the area of its innervation, c) the medial cutaneous nerve of the forearm (medial antebrachial cutaneous nerve) and the area of its innervation.
7. The median nerve (nervus medianus).
8. Intercostal nerves (nervi intercostalis).

### **Lesson 15. Lumbar and sacral plexus. (3 hours)**

1. topography of the lumbar plexus.
2. Branches of the lumbar plexus and the area of their innervation: muscular branches, the lateral femoral cutaneous nerve, iliohypogastric and ilioinguinal nerves.
3. The genitofemoral nerve.
4. The femoral nerve.
5. The obturator nerve.

6. The sacral plexus. The topography of the area and short branches of innervation of sacral plexus: muscular branches of the gluteal (upper, lower) and pudendal nerves.
7. Topography of the sciatic nerve and its branches - the tibial and peroneal nerves and posterior femoral cutaneous nerve.

**Lesson 16. The autonomic sympathetic nervous system. (3 hours)**

1. Dividing of the autonomic nervous system on the sympathetic and parasympathetic based on their "false" functional antagonism.
2. Scheme of the autonomic reflex arc - the existence of 3 elements of its efferent parts: preganglionic fibers, ganglia and postganglionic fibers.
3. Localization of the sympathetic nuclei

**Lesson 17. The autonomic parasympathetic nervous system (3 hours)**

1. The parasympathetic nucleus: The Jakubowicz's (accessory) and Perleya's (unpaired median) nuclei as part of the oculomotor nerve (III pair of cranial nerves).
2. Superior salivary nuclei (nuclei salivatorius) of intermediate nerve (VII pair of cranial nerves).
3. Inferior superior salivary nuclei (nuclei salivatorius) as part of the glossopharyngeal nerve (IX pair of cranial nerves).
4. Dorsal nucleus in the structure of vagus nerve (x pair of cranial nerves).
5. Sacral nucleus in the structure of anterior roots 2nd - 4th sacral spinal cord segments.

**Lesson 18. The final semester seminar. Midterm examination: testing, interview, the solving of case studies (3 hours).**

1. The basic functions of the nervous system.
2. What anatomical structures belong to the peripheral nervous system?
3. The structure of the nerve.
4. Regularities of distribution of superficial and profundal nerves.
5. What branches of the spinal nerves form somatic plexuses?
6. Function of posterior branches of the spinal nerves?

7. Function of anterior branches of spinal nerves?
8. What is involved in the formation of cervical plexus?
9. What is involved in the formation of the brachial plexus?
10. What is involved in the formation of the lumbar plexus?
11. What is involved in the formation of the sacral plexus?
12. Cranial nerves - as derivatives of gill arches.
13. The nerve that develops through the merger of the spinal nerves.
14. Cranial nerves - brain derivatives.
15. Nerves of the head myotomes
16. Signs of the functioning of the autonomic nervous system.
17. The main function of the autonomic nervous system.
18. Where is located the central segment of the sympathetic system?
19. What nuclei are presented in the central part of the parasympathetic section of the system?
20. What pairs of cranial nerves have a vegetative nucleus?
21. What fibers the white connecting branch of the spinal nerve contains?
22. What fibers the gray connecting branch of the spinal nerve contains?
23. What nuclei are in the central section of the parasympathetic system?
24. Where are located the paravertebral sympathetic nuclei?
25. Where are located the paraorgan parasympathetic nuclei?
26. Where are located the intramural parasympathetic nuclei?
27. What pair of cranial nerves without vegetative nucleus contains autonomic fibers?

### **III. EDUCATIONAL-METHODICAL SUPPORT OF STUDENTS' INDEPENDENT WORK**

Educational-methodological support of students's independent work on the subject "Human Anatomy" is presented in Appendix 1 and includes:

The scheduled plan of independent work on the subject, including the approximate time standards for performance on each task;

- Description of tasks for independent work of students and methodical recommendations for their implementation;
- Requirements for the presentation and registration of results of independent work;
- Criteria for assessing the performance of individual work.

#### IV. CONTROL OF ACHIEVEMENT OF THE OBJECTIVES COURSE

№ п/п	Controlled sections / topics of disciplines	Codes and stages of competence formation		Position tools		
				Formative assessment	Midterm control / exam	
1	<b>Module 1</b> Musculoskeletal System <b>Module 2</b> Splanhnology <b>Module 3</b> The nervous system and sensory organs	the capacity for the assessment of morphological and physiological states and pathological processes in the human body for solving professional tasks (GPC – 9)		<b>Know</b>	EP-1 Interview	Exam Questions 1 semestr – 78 2 semestr – 50 3 semestr - 211
				<b>Can</b>	PT-1 Test	PT-1 Test
				<b>Master</b>	PT-1 Test  EP—3 Report, presentation	EP-2 Colloquium

Typical control tasks, methodical materials, defining the knowledge assessment procedures, skills and (or) experience activities, as well as criteria and indicators needed to assess the knowledge, skills and characterizing stages of competences formation during learning the educational program are provided in Appendix 2

## V. LIST OF TEXTBOOKS AND INFORMATIONAL-METHODOLOGICAL SUPPORT OF DISCIPLINE

### Basic literature

*(Electronic and print media)*

1. Color Atlas of Pediatric Anatomy, Laparoscopy, and Thoracoscopy, Merrill McHoney, Edward M. Kiely, Imran Mushtaq 2017  
<https://link.springer.com/book/10.1007/978-3-662-53085-6>
2. Atlas of Lymphatic Anatomy in the Head, Neck, Chest and Limbs, Wei-Ren Pan 2017 <https://link.springer.com/book/10.1007/978-981-10-3749-8>
3. Vascular Anatomy of the Spinal Cord, Armin K. Thron 2017  
<https://link.springer.com/book/10.1007/978-3-319-27440-9>

### Additional literature

*(Electronic and print media)*

1. Clinical Anatomy of the Shoulder, Murat Bozkurt, Halil İbrahim Açar 2017  
<https://link.springer.com/book/10.1007/978-3-319-53917-1>
2. Anatomical Basis of Cranial Neurosurgery, Wolfgang Seeger, Josef Zentner 2018  
<https://link.springer.com/book/10.1007/978-3-319-63597-2>

### Internet Resources

1. <http://elibrary.ru/> - Scientific Electronic Library
2. <http://www.anatomcom.ru/> - electronic resource on anatomy
3. <http://macroevolution.narod.ru/> - electronic resource on evolutionary biology
4. <http://science.km.ru/> - electronic resource on different sections of biology
5. <http://www.booksmed.com/anatomiya/2436-atlas-po-anatomii-cheloveka-ptank-gest-lippincott-williams-wilkins.html> - electronic resource on different sections of the anatomy
6. Computer simulation - 3D atlas <http://www.zygotebody.com>

## **VI. METHODOICAL INSTRUCTIONS ON SUBJECT STUDYING**

During the study course "Human Anatomy" a variety of methods and tools are offered for the development of educational content: lectures, practical exercises, examinations, tests, independent work of students.

Lecture is the main active form of classroom teaching, clarifying of basic and most difficult theoretical sections of human anatomy, which involves intense mental activity of the student, and is particularly difficult for first-year students. Lecture should always be informative, developing, educational and organizing character. Lecture notes help to assimilate the theoretical material discipline. During the lecture, it is necessary to write the most important and desirable to own wording to better remember the material.

Lecture notes are useful when it is written by the student.

You can develop your own pattern of words cuts. The name of those sections can be isolated by colored markers or pens. In the lecture the teacher gives only a small portion of the information on topic or other topics, which are described in textbooks. Therefore, it is always necessary to use the basic textbook at work with lecture notes and additional literature that is recommended in the discipline.

In teaching of lecture course on the subject "Human anatomy" as a form of active learning are used: lecture - conversation lecture-visualization, which are based on the knowledge acquired by students in other disciplines: "Biology", "Chemistry", "Physics".

To illustrate the verbal information can be used presentations, tables, diagrams on the board. During the presentation of lecture material are placed problematic issues or issues with the discussion items.

### **Lecture - Visualization**

Lecturing is accompanied by display tables, slides, which facilitates better perception of the material. Lecture - visualization requires certain skills - verbal



presentation of the material must be accompanied by and integrated with visual form. The information contained in the form of diagrams on the blackboard, tables, slides, allows you to create the problematic issues, and contribute to the development of professional thinking of future specialists.

### **Lecture - discussion.**

Lecture - discussion, in pedagogy this form of learning is called "dialogue with the audience". It is the most common form of active learning and allows engaging students in the learning process, as there is direct contact with the teacher and audience. Such contact is achieved during the lectures, when students are asked informational and problem or when the students can ask lecturer questions themselves. Questions are offered for of all audience, and every student may offer their answer, another student can supply them. At the same time, it is possible to gradually reveal more active students and try to activate the students who do not participate in the work. This form of lectures allows students to engage in work, to increase their attention, thinking, get a collective experience, and learn how to form questions. Lecture-conversation advantage is that it allows you to attract the students' attention to the most important issues of the theme, to determine the content and temp of presentation of educational material.

### **Lecture - Press Conference**

At the beginning of classes a teacher calls the lecture topic and asks the students to put questions to him in writing on this topic. Each student should for 2-3 minutes to formulate the most interesting questions on topic of the lecture, write them on a piece of paper and pass a note to the teacher.

For 3-5 minutes a teacher sorts questions about their semantic content and begins to lecture. The material is presented in the form of a connected theme disclosing, and not as a response to every question, but in the process of the lectures appropriate responses are formulated. At the end of the lecture the teacher conducts

a final assessment of the issues, identifying the knowledge and interests of students.

### **Practical classes on discipline "Human Anatomy"**

Practical classes - a collective form of consideration of educational material. The seminars, which are also one of the main types of practical classes for in-depth study of discipline going online.

At the lessons the questions related to the subject are puzzled out, then teachers and students together hold discussions, which aims at consolidating the discussion material, formation of skills, to debate, to develop independence and critical thinking, the ability of students to orient in large information flows, to develop and defend their own position on the problem issues of educational disciplines.

The active learning methods are used in practical classes: press conference, detailed discussion, debate. The detailed discussion suggests the preparation of students for each issue of the lesson plan with common for all the recommended list of obligatory and additional literature.

The reports are prepared by the students on the previously proposed theme.

The dispute in the group has a few advantages. The dispute may be caused by the teacher during the classes or planned him previously.

During the debate, students formed their inventiveness, speed of mental reactions. Press conference. Teacher instructs 3-4 students to prepare summary reports. Then one of the members of this group makes a report. After the presentation, students asked questions. Speaker and other responsible members of the expert answer the questions. Based on the questions and answers the teacher organizes a creative discussion.

## **VII. MATERIAL AND TECHNICAL EQUIPMENT OF SUBJECT**

1. Lecture hall with multimedia software.
2. The auditory for practical classes, examinations.

3. The auditory for testing.
4. Negatoscopes, macropreparations, models, radiographs, CT scans, atlases

### VIII. LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	List of licensed software
Multimedia auditorium Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m2 (Room for independent work)	Windows Seven enterprise SP3x64 Operating System Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.

In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs

For education students use the following software: Microsoft Office package (Excel, PowerPoint, Word and other д.), electronic resources of the FEFU website, including the resources of the FEFU Scientific Library.

Scopus and Web of Science citation index and scientific literature database, NCBI databases and PubMed citation index and scientific literature database, electronic libraries eLIBRARY, "Znanium", IPRbooks, database and book collection of EBSCOhost. database of the FEFU Scientific Library.

A number of textbooks has electronic versions purchased by the University with the access via the FEFU Scientific Library website.

## MATERIAL AND TECHNICAL EQUIPMENT OF DISCIPLINE

Name of the equipped rooms and rooms for independent work	List of main equipment
The computer class of the School of biomedical AUD. M723, 15 work places	<p>Screen, electrically 236*147 cm to trim the screen; Projector DLP technology, 3000 ANSI LM, WXGA with 1280x800 resolution, 2000:1 Mitsubishi EW330U; Subsystem of specialized mounting equipment course-2007 Tuarex; Subsystem of videocommunity: matrix switch DVI and DXP 44 DVI Pro advertising; extension cable DVI over twisted pair DVI 201 TX/RX advertising; Subsystem of audiocommentary and sound; speaker system for ceiling si 3ct LP Extron on from; digital audio processor DMP 44 LC the Extron; the extension for the controller control IPL T CR48; wireless LAN for students is provided with a system based on 802.11 a/b/g/N 2x2 MIMO(2SS) access points.</p> <p>Monoblock HP Loope 400 all-in-one 19.5 in (1600x900), core i3-4150t, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, and a DVD+ / -RW, GigEth, Wi-Fi and BT, the USB port of roses/MSE, Win7Pro (64-bit)+Win8.1Pro(64-bit), 1-1-1 Wty</p>
Reading rooms of the Scientific library of the University open access Fund (building a - 10)	<p>Monoblock HP Loope 400 All-in-One 19.5 in (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW,GigEth,wifi,BT,usb kbd/mse,Win7Pro (64-bit)+Win8.1Pro(64-bit),1-1-1 Wty Speed Internet access 500 Mbps.</p> <p>Jobs for people with disabilities equipped with displays and Braille printers.; equipped with: portable reading devices flatbed texts, scanning and reading machines videovelocity with adjustable color spectrums; increasing electronic loops and ultrasonic marker</p>
690922, Primorsky Krai, Vladivostok, Russky Island, Saperny Peninsula, Ayaks, 10, aud. M 608 (anatomical museum)	<p>Anatomical museum</p> <p>Training class of human anatomy and physiology (models, phantoms, tablets, anatomical preparations)</p> <p>Anatomical preparation " Brain"</p> <p>Anatomical preparation " Section of the brain at the level of basal nuclei"</p> <p>Anatomical preparation " Preparation of the whole human body"</p> <p>Anatomical preparation " Stomach"</p> <p>Anatomical preparation " Small intestine (segment)"</p> <p>Anatomical preparation " Sigmoid colon"</p> <p>Anatomical preparation " Ileocecal angle with Appendix"</p> <p>Anatomical preparation " Liver"</p> <p>Anatomical preparation " Kidneys with renal vessels, abdominal aorta and inferior Vena cava"</p> <p>Anatomical preparation " Male genitals in combination with rectum and perineum"</p> <p>Anatomical preparation "of the Female sex organs in complex with the rectum and perineum"</p> <p>Anatomical preparation "Respiratory system (organocomplex)"</p> <p>Anatomical preparation "The Shoulder and acromioclavicular joints"</p> <p>Anatomical preparation " Elbow joint"</p> <p>Anatomical preparation "Wrist joint and joints of the hand bones"</p> <p>Anatomical preparation "The Knee joint (opened)"</p>

	<p>Anatomical preparation "The Ankle and connecting bones of the foot"</p> <p>Anatomical preparation " Hip and sacroiliac joints"</p> <p>Anatomical preparation " Heart and large vessels"</p> <p>Anatomical preparation " Vessels of internal organs of the upper floor of the abdominal cavity"</p> <p>Anatomical preparation " Trachea, main and segmental bronchi"</p> <p>Anatomical preparation " Lungs with trachea and main bronchi"</p> <p>Anatomical preparation "The nasal Cavity and nasopharynx"</p> <p>Anatomical preparation "The Larynx, trachea"</p> <p>The basic model of the cross section of the kidney, 3-fold increase</p> <p>Liver model with gallbladder</p> <p>Digestive system model, 3 parts</p> <p>Model of kidney with organs of the posterior part of the upper abdominal cavity</p> <p>Arm model with muscles, 6 pieces</p> <p>Leg model with muscles, 7 pieces</p> <p>Brush internal structure model</p> <p>Skeleton model of arm with ligaments and muscles</p> <p>Model of muscles of the head with the nerves</p> <p>Model ventricle of the brain</p> <p>Female pelvis and pelvic floor, 5 pieces</p> <p>Model of female pelvis with ligaments, vessels, nerves, pelvic floor muscles and organs</p> <p>The heart model, 7 parts</p> <p>Torso in the form of horizontal sections</p> <p>A model of a muscle fiber</p> <p>Functional model of shoulder joint</p> <p>Functional model of the hip joint</p> <p>Functional model of the knee joint</p> <p>Functional model of the elbow joint</p> <p>Model of foot skeleton with ligaments and muscles</p> <p>Model of the whole skeleton, disassembled, with a skull of 3 parts</p> <p>Set of 24 vertebrae</p> <p>Model of the human skull, combined with the brain and spine</p>
Multimedia audience	<p>Monoblock Lenovo C360G-i34164G500UDK; projection Screen Projecta Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen 1920 x 1080; Flush interface with automatic retracting cables TLS TAM 201 Stan; Avervision CP355AF; lavalier Microphone system UHF band Sennheiser EW 122 G3 composed of a wireless microphone and receiver; Codec of videoconferencing LifeSizeExpress 220 - Codeconly - Non-AES; Network camera Multipix MP-HD718; Two LCD panel, 47", Full HD, LG M4716CCBA; Subsystem of audiocommentary and sound reinforcement; centralized uninterrupted power supply</p>



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higher education  
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(FEFU)

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SCHOOL OF BIOMEDICINE

**EDUCATIONAL AND METHODOLOGICAL SUPPORT INDEPENDENT WORK  
OF STUDENTS  
on the subject "Human anatomy"  
Speciality 31.05.01 General Medicine  
Full-time training**

Vladivostok  
2017

Independent work includes:

1. Work in the library or homework with the literature and the written summary of lectures;
2. preparation for the practical lessons;
3. preparation for the tests and final interviews;
4. work with microscopic preparations in the laboratory.

The order to perform independent work is defined by the following schedule of execution of independent work.

Control of independent work progress is evaluated in the process of laboratory lessons, practical lessons, oral tests, test works and interviews.

The tasks for control of independent work are defined by the themes and topics of the subject's content.

#### **The schedule plan of independent work in the subject.**

<b>№ n/n</b>	<b>Date / terms of performance</b>	<b>Kind of independent work</b>	<b>Estimated time standards for performance</b>	<b>Kinds of control</b>
<b>1 semester</b>				
1	2-6 week	Essay	27 h	OR-3-Report, Message
2	7-16 week	Presentation on the abstract	27h	OR-3-Report, Message
3	17-18 week	Preparing for exam	36 h	OR-1-interview PW-1 - Test
<b>2 semester</b>				
1	2-6 week	Essay	3 h	OR-3-Report, Message
2	7-16 week	Presentation on the abstract	6 h	OR-3-Report, Message
3	17-18 week	Preparing for exam	45 h	OR-1-interview PW-1 - Test
<b>3 semester</b>				
1	2-6 week	Essay	3 h	OR-3-Report, Message
2	7-16 week	Presentation on the abstract	6 h	OR-3-Report, Message
3	17-18 week	Preparing for exam	27 h	OR-1-interview PW-1 - Test

## **Topics for essays and presentations**

Academic plan on Anatomy includes 90 hours of independent work, within this time 3 verbal presentations are performed on the proposed topics.

1. The lumbar region and the retroperitoneal space
2. The gray and white matter of the brain
3. The optic nerve
4. The vegetative (autonomic) nervous system
5. Sexual human system, its anatomo-physiological and age features.
6. Cerebral circulation
7. The stomach anatomy
8. Cardiovascular System
9. The anatomical structure of the lung
10. Age Anatomy, Physiology and Hygiene
11. Cranial nerves
12. Morphofunctional characteristic transition of the junction place of esophagus into the stomach
13. Female reproductive systeme
14. The structure of the organ of vision
15. Arteries of the lateral surface of the brain
16. Arteries of the pelvis and lower limbs
17. Pancreas
18. Anatomy of the chest: lungs, esophagus
19. Brain
20. Internal human organs and their functions
21. Central nervous system. Spinal cord.
22. Blood supply and innervation of the musculoskeletal system and internal organs
23. The muscles of the head
24. The history of the anatomy. Types of anatomy. Anatomy Objectives.



25. General information about the human ontogenesis. Ontogenesis stages.
26. Ecoanatomy. Classification of ecological factors.
27. The forms of interaction of the organism with the external environment.
28. The nasal cavity: walls, nasal passages and their communications.
29. The trachea and main bronchi: structure, topography, blood supply, lymph drainage and innervation.
30. The basal forebrain nucleus. Striopallidarnoy system. White matter.
31. Forbrain, its cavities and their communications.
32. Sulci and gyri of the hemispheres, the localization of cortical centers of 1 and 2 signaling systems.
33. Olfactory brain: anatomical structure of the central and peripheral sections
34. Heart: external structure; 3 circulations.
35. The structure of the wall of the heart and pericardium
36. Structural elements, age features and functions of the immune system.
37. The sympathetic division of ANS, central and periipheral segments. Sympathetic trunks (sympathetic chain, gangliated cord)
38. The parasympathetic divisions of the ANS: central and peripheral segments.
39. Vegetative abdominal plexus: formation, topography, areas of innervation.

### **Oral presentation evaluation criteria**

Oral report on the subject "Human Anatomy" is estimated by point scale: 5, 4, 3.

"5 points" to the students, when he expressed his opinion on the formulated problem, argued it, precisely defining the content and components, he can analyze, synthesize the material and make the right conclusions from the basic and additional literature, freely answering questions, what indicates, he knows and owns the material.

"4 points " to the students, if he presents the material on a selected topic coherently and consistently, resulting in arguments to prove one or the other position in the report, demonstrates the ability to analyze basic and additional literature, despite some inaccuracies in the wording of the concepts.

"3 points" to the students, if he had an independent analysis of basic and additional literature, however, is not always sufficiently argued some points of the report, make mistakes in presenting the material and not always fully respond to additional questions about the presentation.

### **Methodical instructions for preparation of presentations**

For preparation of the presentation ito use: PowerPoint, MS Word, Acrobat Reader, LaTeX-ovsky beamer package. The simplest program for creating presentations - Microsoft PowerPoint. To prepare the presentation, you must process the information gathered while writing the essay.

The sequence of preparation of the presentation:

1. Clearly formulate the purpose of the presentation.
2. Determine what will be the presentation format: a live performance (then, how much will its duration) or e-mailing (what will be the presentation of context
3. Select all the content part of the presentation and build a logical chain of presentation.
4. Determine the key points in the content of the text and highlight them.
5. Determine the visualization types (images) to display them on the slides according to the logic, purpose and specificity of the material.
6. Choose design and format slides (the number of images and text, their location, color and size).
7. Check the visual perception of the presentation.

The methods of visualization are illustrations, images, charts, tables. Illustration is representation of real-life visual series.

The images - in contrast to the illustration - metaphor. Their purpose - to cause emotion and create a relationship to it, to influence an audience. With the help of well-designed and submitted images, information can long remain in memory of the person.

Diagram - visualization of quantitative and qualitative relations. They are used to demonstrate the convincing data for spatial thinking in addition to the logical.

Table - concrete, visual and accurate data display. Its main purpose - to structure the information, which sometimes facilitates the perception of data by the audience.

#### *Practical advices on preparing presentations*

- printed text + slides + handout should be prepared separately;
- slides - visual presentation of information, which must contain a minimum of text, images maximum carrying semantic load, to look clearly and simply;
- the text content of the presentation - speaking or reading, which should include the arguments, facts, reasoning, and emotions;
- recommended number of slides 17-22;
- The regulated information for the presentation of: topic, name and initials of the speaker; communication plan; summary of what has been said; list of references;

Handout - should provide the same depth and scope as the live performance: the people have more confidence in what they can carry, than disappearing images, words are forgotten and slides and handouts remains constant tangible reminder; it is important to distribute the handout at the end of the presentation; Handouts must differ from the slide, should be more informative.

#### **Methodical instructions for the preparation to practical classes**

Control of results of independent work carried out during the practical classes, oral interviews, interviews, solving case studies, tests, including by testing.

1. For practical classes the student should be prepared: to repeat the lecture material, read the required section in the textbook on the subject.
2. The lesson begins with a quick frontal verbal questioning on a given topic.
3. At the lessons, students work with a collection of preparations and atlases.
4. For classes, it needs to have a notebook to write theoretical material, a textbook and an atlas.
5. The study of anatomical preparations starts with the right location.
6. After viewing the preparation, students define the basic details of its structure.
7. At the end of class the teacher gives you homework on a new topic and offers to make tests on anatomical preparations, which have been studied in class.

Presentations and students' activity are assessed by current point.

### **Methodical instructions for preparation of the report**

1. Independent choice of a selected topic by the student.
2. Selection of literature on a chosen topic from the the recommended basic and additional literature, which is proposed in the work program of the discipline, as well as work with the resources of the network "Internet", indicated in the work program.
3. Work with the scientific publications and textbooks is not limited to reading material, it is also necessary to analyze the collected literature and to compare the presentation of material on the theme in different literary sources, to collect material, so that it reveals the theme of the report.
4. The analyzed material should be noted. Most importantly, it should not be just a conscientious rewriting source texts from the selected literature without any commentary and analysis.
5. Having worked for literature and student report makes a plan that is the basis for the preparation of the report.

6. The report should be logically built. Students expound material integrally, coherently, consistently and make conclusions. It is desirable that the student could express his opinion on the formulated problem.

7. The duration of the report is not more than 7-10 minutes. Report told, not read on paper.

### **Methodical instructions for working with literature**

It is necessary to make an initial list of sources. The basis can be a list of literature recommended in the work program of the course. For convenience, you can make your own card file of selected sources (author's name, title, publication specifications) in the form of a working file on your computer.

This card file has the advantage because it allows you to add sources, to replace for some other in the need, to remove the ones that were not appropriate subjects. The initial list of references can be completed using the electronic FEFU library catalog, and students should ask for help the library staff.

Working with the literature on this or another topic, it is necessary not only to read but also to learn the method of its study: a brief conspectus, an algorithm, the scheme of the reading material that makes it easier to understand, remember. It is not recommended to rewrite the text word for word.



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SCHOOL OF BIOMEDICINE

**FUND OF ASSESSMENT TOOLS**  
**on the subject "Human Anatomy"**  
**on the subject "Human anatomy"**  
**Speciality 31.05.01 General Medicine**  
**Full-time training**

Vladivostok  
2017

## Fund of assessment tools passport

The passport is filled in accordance with the Regulations on the Funds of assessment tools of educational programs of higher education - undergraduate, specialist's and master's programs of Far Eastern Federal University, approved by order of the rector of 12.05.2015 №12-13-850.

Code and formulation of competence.	Stages of formation of competence	
the capacity for the assessment of morphological and physiological states and pathological processes in the human body for solving professional tasks (GPC – 9)	<b>Know</b>	<ul style="list-style-type: none"> <li>- methods of of anatomic researches and anatomical terms (Russian and Latin);</li> <li>-general patterns the human body structure, the structural and functional relationships of body parts</li> <li>- traditional and modern methods of anatomical studies;</li> <li>-anatomical and topographical relations of organs and body parts in the adult, children and adolescents;</li> <li>-main details of the structure and topography of organs, their systems, their basic functions at different ages;</li> <li>- possible options for the structure, main anomalies and malformations of organs and their systems.</li> </ul>
	<b>Can</b>	<ul style="list-style-type: none"> <li>-to seek out and show on anatomic preparations bodies and parts, structural details;</li> <li>-orientate to the topography and the details of the structure of bodies for anatomical preparations</li> <li>-correctly to call organs and their parts on the Russian and Latin</li> <li>-find and show on radiographs organs and the basic details of their structure</li> <li>- find and out feelers on the body of a living person the basic bone and muscle benchmarks applied projection of the major neurovascular bundles of the human body areas</li> </ul>
	<b>Master</b>	<ul style="list-style-type: none"> <li>-medical and anatomical conceptual apparatus</li> </ul>

№ п/п	Controlled sections / topics of disciplines	Codes and stages of competence formation		Position tools	
				<a href="#">Current control</a>	Midterm control / exam
1	<b>Module 1</b> Musculoskeletal System <b>Module 2</b> Splanhnology <b>Module 3</b> The nervous system and sensory organs	GPC-9  Ability to assessing of the morphological and functional, physiological conditions and pathological processes in the human body for professional objectives.	<b>Know</b>	EP-1 Interview	Exam Questions 1 semestr – 78 2 semestr – 50 3 semestr - 211
			<b>Can</b>	PT-1 Test	PT-1 Test
			<b>Master</b>	PT-1 Test  EP—3 Report, presentation	EP-2 Colloquium
2	<b>Module 1</b> Musculoskeletal System <b>Module 2</b> Splanhnology <b>Module 3</b> The nervous system and sensory organs	SPC-16  Readiness for educational activities to eliminate the risk factors and develop the skills of healthy lifestyle	<b>Know</b>	EP-1 Interview	Exam Questions 1 semestr – 78 2 semestr – 50 3 semestr - 211
			<b>Can</b>	EP-1 Interview	PT-1 Test
			<b>Master</b>	PT-1 Test  PT-11 Case-task	EP-2 Colloquium
9 10	<b>Module 1</b> Musculoskeletal System <b>Module 2</b> Splanhnology <b>Module 3</b> The nervous system and sensory organs	Readiness for analysis and public presentation of medical information based on evidence- based medicine;	<b>Know</b>	EP-1 Interview	Exam Questions 1 semestr – 78 2 semestr – 50 3 semestr - 211
			<b>Can</b>	EP-1 Interview	PT-1 Test



			<b>Master</b>	PT-1 Test  PT-11 Case-task	EP-2 Colloquium
		SPC-21 Ability to take part in research	<b>Know</b>	EP-1 Interview	Exam Questions 1 semestr – 78 2 semestr – 50 3 semestr - 211
	<b>Can</b>		EP-1 Interview	PIP-1 Test  PT-1 Test	
	<b>Master</b>		PT-1 Test  PT-11 Case-task	EP-2 Colloquium	

### CONTROL OF THE COURSE GOALS ACHIEVEMENTS

Code and formulation of competence.	Stages of formation of competence	
GPC-9  the capacity for the assessment of morphological and physiological states and pathological processes in the human body for solving professional tasks	<b>Know</b>	<ul style="list-style-type: none"> <li>- methods of of anatomic researches and anatomical terms (Russian and Latin);</li> <li>-general patterns the human body structure, the structural and functional relationships of body parts</li> <li>-traditional and modern methods of anatomical studies;</li> <li>- anatomical and topographical relations of organs and body parts in the adult, children and adolescents;</li> <li>- main details of the structure and topography of organs, their systems, their basic functions at different ages;</li> <li>- possible options for the structure, main anomalies and malformations of organs and their systems.</li> </ul>

	<b>Can</b>	<p>- to seek out and show on anatomic preparations bodies and parts, structural details;</p> <p>- orientate to the topography and the details of the structure of bodies for anatomical preparations</p> <p>- correctly to call organs and their parts on the Russian and Latin</p> <p>- find and show on radiographs organs and the basic details of their structure;</p> <p>- find and out feelers on the body of a living person the basic bone and muscle benchmarks applied projection of the major neurovascular bundles of the human body areas</p>
	<b>Master</b>	- medical and anatomical conceptual apparatus

### Scale of competence level assessment

Code and formulation of competence.	Stages of formation of competence		Criteria	Indicators	Points
the capacity for the assessment of morphological and physiological states and pathological processes in the human body for solving professional tasks (GPC – 9)	Knows (entry level)	Basic methods of human anatomy, applied to a living man and a corpse	Knowledge of the basic terminology of anatomy	The ability to define the basic concepts of anatomy	65-71
	Able (advanced level)	To use educational, scientific, popular scientific literature, the Internet for professional activities	The use of basic concepts on research methods; confident use of information sources	The ability to list and reveal the essence of the methods applied in anatomy	71-84
	Master (high level)	simple medical tools (tweezers, scalpel)	Ability to work with tools	The ability to work with medical instruments and its correct application	85-100

## **Methodical recommendations for the final evaluation of the subject development**

**The interim attestation of students.** The interim attestation of students on the subject "Human Anatomy" is carried out in accordance with the local regulations of the Far Eastern Federal University and is obligatory.

Passing the exam orally suggests as an interim attestation.

### Evaluation tools for intermediate certification

Questions for the exam on the subject "Human Anatomy" - 1 semester

1. The structure of the the tubular bones.
2. Distinctive features of the cervical, thoracic and lumbar vertebrae.
3. Costal arc.
4. The structure of the scapula.
5. Structure of the humerus bone.
6. Structure of the ulna.
7. Radial bone. The structure of the epiphysis.
8. Parts of the hand.
9. Identify and show the bones of the wrist.
10. The structure of the pelvis.
11. Find the greater trochanter.
12. The structure of the tibia.
13. Parts of the talus and calcaneus.
14. Connect the the rib with the vertebrae.
15. Connect the the clavicle to the scapula and the sternum.
16. Types of connections and functions.
17. Continuous compounds: classification, structure, features of functions.
18. Diarthrosis: classification, features of functions.
19. The structure of the joints.
20. Essential elements of the joints.
21. Auxiliary elements of the joints.

22. Differences between synarthrosis and diarthrosis.
23. Features of the form and function of the joints.
24. Fundamentals of kinematics joints.
25. The connections between the vertebrae. Movement of the spine.
26. Atlantooccipital joint.
27. The vertebral column. Forming bends.
28. Temporomandibular joint.
29. The conjunction of ribs with the vertebrae and the sternum.
30. The chest in general.
31. The shoulder joint: structure, shape, movement.
32. Elbow joint: structure, shape, movement.
33. Compounds of the forearm bones.
34. Joints of hand.
35. Compounds of the pelvis. The pelvis in general.
36. Age and gender characteristics of the pelvis. The dimensions of the female pelvis.
37. The hip joint: structure, shape, movement.
38. The knee joint: structure, shape, movement.
39. Joints of foot: the structure, shape, movement.
40. The arches of the foot.
41. The muscles involved in the rotation of the scapula.
42. Auxiliary apparatus of muscle.
43. Muscle synergists, agonists, antagonists. Give examples.
44. The muscles involved in movements of the upper limb girdle around vertical axis.
45. The muscles, raises and lowers the upper limb girdle, choose exercises for their development.
46. The muscles involved in the rotation of the scapula
47. The muscles involved in the abduction, adduction, pronation and supination of the shoulder.

48. Axillary cavity, its walls. fasciae shoulder.
49. The muscles of the shoulder flexors and extensors.
50. The muscles involved in flexion and extension of the forearm.
51. Sulcuses of forearm.
52. The muscles involved in pronation and supination of the forearm
53. Cubital fossa.
54. Flexion and extension of the hand and fingers.
55. Abduction and adduction of the hand
56. Fasciae and topography of muscle of the upper limb.
57. The muscles involved in flexion and extension of the thigh.
58. The femoral triangle and femoral sulcus
59. The movement of the femur and tibia around a vertical axis. Analysis of the muscle when performing these movements.
60. Muscles, flexion and extension of lower leg and foot.
61. Canalis cruropliteus
62. The muscles involved in the abduction and adduction, supination, pronation of the foot.
63. The arches of the foot, their firming machine.
64. The movement of the hips around the sagittal axis.
65. Adductor canal.
66. Topography of the lower limb of muscle, the projection of the skin of muscle.
67. The muscles involved in the extension of the spinal column.
68. The muscles involved in flexion of the spinal column. Choose the exercises to develop them.
69. The muscles and fasciae of the back, their function, age features.
70. The muscles involved in the act of inhalation.
71. The muscles involved in the act of exhalation.
72. Superficial neck muscles hyoid bone.
73. The deep muscles of the neck.

74. Fasciae of the neck. Topography of the neck muscles.
75. Weak points of anterior abdominal wall.
76. Mimic and masticatory muscles.
77. linea alba. The vagina of the rectus abdominis muscle.
78. Inguinal and femoral canal.
79. The muscles of the pelvis: the beginning, attachment, function.

### **Questions for the exam on the subject "Human Anatomy" - 2 semester**

1. The nasal cavity: walls, nasal passages and their communications.
2. Larynx: the walls of the structure, parts, elastic conefolds, glottis, topography, structure.
3. The trachea and main bronchi: structure, topography.
4. Lungs: the outer and the inner structure of the gate, the root elements, topography.
5. Topography of the visceral and parietal pleura. The pleural cavity, pleural sinuses.
6. Mediastinum: boundaries, contents.
7. The oral cavity: walls, content, pharynx. Tongue, its structure.
8. Throat: parts, the structure of the walls, communication, topography.
9. Esophagus: structure, narrowing the topography.
10. Stomach: structure, ligaments, topography.
11. Liver: external structure, grooves, and their contents, ligaments. The formation of the portal vein and hepatic veins.
12. Topography of the liver.
13. Gall bladder: the structure. Bile ducts.
14. The pancreas: structure, narrowings, the topography.
15. Duodenum: parts, structure, topography. Show parts of duodenum on duodenogramme.
- 1) 16. Jejunum and ileum: structure, topography.
16. Large intestine: parts, features of the wall structure, topography.

17. Rectum: parts, especially features of the wall structure, topography.
18. The walls of the abdominal cavity. Retroperitoneal space. Serous membranes of the pleural cavity.
19. The boundaries of the upper, the lower floors of the abdomen and pelvis.
20. Parts of the peritoneal cavity of the upper, the lower floors, pelvic:  
bursae, mesenteric sinuses, flanks.
- 2) 22. Omental bursae (sac): wall, omental hole and the wall.
- 3) 23. Kidney: external and internal structure. nephron scheme.
- 4) 24. Topography of kidneys.
26. Pyelocaliceal kidney complex. Ureter: parts, narrowing.
27. Bladder: structure, topography. On cystogram to find bladder, to determine its location and shape.
28. The internal male genital organs: the structure, topography.
29. The testicle and spermatic cord: structure, topography.
30. Ovary: structure, topography.
31. Uterus: structure, topography. X-ray anatomy.
32. Fallopian tubes: structure, topography. X-ray anatomy.
33. Vagina: structure, topography.
- 5) 32. Vagina: structure, topography.
34. endocrine glands: classification. The structure, topography, functions.
35. The surfaces of the heart.
36. The chambers of the heart.
37. Anatomical structures which increase the atrial cavity.
38. atrioventricular valves, to name valvular structures.
39. Semilunar valves
40. The layers of the heart wall.
41. Topography of the heart.
42. The arteries supplying the heart.
43. The roots of the superior vena cava
44. Venous angle

45. Superficial veins of the upper limb
46. The roots of the inferior vena cava
47. Inflows of the inferior vena cava (caval vein)
48. Superficial veins of lower limb
49. Portal vein (vena porta) and its inflows
50. Dural venous sinuses
51. Hepatic veins

### **Questions for the exam on the subject "Human Anatomy" - 3 semester**

#### **General theoretical basics of morphology.**

1. Anatomy as science and academic discipline. The history of the anatomy. Types of anatomy. Anatomy objectives.
2. Purpose, content and place of anatomy in medical training system.  
The origin and development of anatomy as an independent science.
3. Overview of human ontogenesis. Ontogenesis stages.
4. Research methods used in anatomy
5. Ecomorphology. Classification of environmentally important factors.
6. Forms of interaction of the organism with the external environment.

#### **Osteology, artrosindesmology, craniology**

7. Connections of vertebrae. Vertebral column: departments, the formation of bends.
8. The vertebral column and its departments. The structure of the vertebrae. Connections of the vertebral column. Atlantoaxial and atlantooccipital joints.
9. Types of ribs.
10. Thorax, structure, shape.
11. The structure of the sternum and ribs.
12. Connections of ribs to the sternum and spine.
13. The structure of the bones and joints of the upper limb girdle.



14. Sternoclavicular joint.
15. The structure of the free upper limb bones.
16. The structure of the free upper limb joints.
17. The structure of the pelvic bone.
18. Pelvis. Features of the structure of large and small pelvis. Gender differences of the pelvis.
19. The structure of the free lower limb bones.
20. The arches of the foot.
21. The structure of the free lower limb joints.
22. Connections of the skull bones.
23. Temporomandibular joint: structure, ligaments. The shape, movement types.
24. The shoulder joint: structure, ligaments, shape, types of movements.
25. Elbow joint: ligaments, shape, types of movements.
26. The wrist joint: structure, shape, types of movements.
27. The skeleton of hand. Joints of hand.
28. The bones of the pelvis. Connections of the pelvis (synostosis, synchondroses, syndesmosis, diarthrosis)
29. Large and small sciatic holes, the boundary between the large and small pelvis. Dimensions of the pelvis.
30. The hip joint: structure, shape, types of movements.
31. The knee joint: structure, shape, types of movements.
32. Ankle joint: structure, shape, types of movements.
33. The skeleton of the foot. The joints of the foot.

### **Craniology.**

34. Sphenoid bone: parts, holes, fissurae, channels.
35. Temporal bone: parts, the structural features of the pyramid, the channels and their contents.
36. The bones of the facial skull.

37. The internal base of the skull: anterior, middle and posterior fossae, walls and connections.
38. The walls and communication of the orbit. Nerves and blood vessels passing through the optic canal and Inferior orbital fissure (fissura orbitalis inferior).
39. The temporal, infratemporal and pterygopalatine fossae and their contents.
40.       Paranasal sinuses and their communications.
41.       Sulcuses of venous sinuses of the skull.
42.       **Myology.**
43.       Classification and structure of muscles. Structure and mechanism of contraction of muscle fibers.
  - a. The auxiliary apparatus of muscle, its value. Types of muscle. Factors affecting muscle strength. Muscle tone. Lever arm. Antagonism and synergism muscles.
  - b. Mimic and masticatory muscles. Functions.
  - c. The muscles of the neck. Functions. Triangles of the neck.
  - d. Fascias and interfascial neck area.
44.       The muscles of the back. Functions.
45.       The muscles of the chest and topography.
46.       The muscles of the abdomen. The vagina is the rectus abdominis muscle, the linea alba.
47.       The inguinal canal. Its contents.
48.       The diaphragm: parts, hiatuses and fissurae. Blood supply and innervation.
49.       The muscles of the shoulder girdle. Functions.
50.       The muscles of the shoulder and topography.
51.       The walls of the axillary cavity, holes of the posterior wall.
52.       The muscles of the forearm. Functions.
53.       Topography of forearm.

54. The muscles of hand. Functions.
55. The muscular and vascular lacuna. Their contents.
56. The muscles and fascia of the perineum.
57. The muscles of the pelvis. Over - and Subpiriforme space and obturator canal.
58. The muscles of the thigh. Functions.
59. Topography of the hip: the furrows, the femoral triangle.
60. The femoral canal.
61. The adductorial channel, its contents.
62. The popliteal fossa, its contents. 61. The muscles of the lower leg. Functions.
63. Canalis cruropopliteus.
64. The muscles of the foot and topography

### **The respiratory and digestive systems.**

65. Respiratory system. Morphofunctional characteristics. Respiratory and non-respiratory function. Airways. Sources of development. The structure and function of the trachea. The dependence of the structure of the bronchi and bronchioles walls from their caliber.
66. Acini as the morpho-functional unit of the lung. Structural components of the acinus. The structure of the alveolar walls. Types of alveolocytes and their histo-functional characteristic.
67. Structural and chemical organization and function of surfactant-alveolar complex. Aero - hematic barrier and its value in gas exchange. Features of the blood supply to the lung. Age features of the lung.
68. The nasal cavity: walls, nasal passages and their communications. On the line side and kraniogramme to show the paranasal sinuses.
69. The nasal cavity: walls, nasal passages and their messages. On the line and side craniogrammes to show sinuses.

70. Larynx: the structure of the walls, parts, elastic cone-folds, glottis, topography, structure, blood supply, lymph drainage and innervation. The trachea and main bronchi: structure, topography, blood supply, lymph drainage and innervation.
71. Lungs: the outer and the inner structure of the gate elements of roots, topography, blood supply, lymph drainage and innervation.
72. On the radiograph of the chest in frontal and lateral projections to show the shadow figures of the roots of the lungs, heart and vascular bundles, domes of the diaphragm, pleural sinuses.
73. Topography of the visceral and parietal pleura. The cavity of the pleura, pleural sinuses.
74. Mediastinum: boundaries contents. Show on radiographs of the thoracic cavity in frontal and lateral projections the shadow pattern of mediastinal organs.
75. Oral cavity: walls, content, pharynx.
76. Tongue, its structure, blood supply and innervation. Common morphofunctional characteristic of the mucosa. Age-related changes.
77. Teeth. Enamel, dentin, cement and pulp of the tooth - the structure and meaning, innervation, blood supply. Age-related changes.
78. Large salivary glands. Blood supply, innervation, lymphatic drainage
79. Esophagus: its structure and functions. Blood supply, innervation, lymphatic drainage. The structure of the various parts of the esophageal wall. Features of the structure of the wall of the esophagus in the newborn and in different periods after birth.
80. The digestive tract. The total plan of structure of the wall. Features of the mucosa of various sections of the digestive tract.
81. The tonsils, structure and function. Blood supply, innervation, lymphatic drainage.

82. Stomach. Common morphological and functional characteristics. Innervation and vascularization. Age features.
83. The small intestine. Blood supply, innervation, lymphatic drainage. Age features.
84. Colon. Appendix. Blood supply, innervation, lymphatic drainage. Age features.
85. The glands of the digestive system. Localization and structural organization.
86. Pancreas. Development, structure, exo- and endocrine parts. Age-related changes. Blood supply, innervation, lymphatic drainage.
87. Liver. Features of the blood supply.
88. Gallbladder, structure and function. Blood supply, innervation, lymphatic drainage.
89. Throat: parts the structure of the walls, communications, topography, blood supply, innervation, lymphatic drainage.
90. Esophagus: structure, narrowing, topography, blood supply, innervation, lymphatic drainage. On the radiograph of the esophagus to find physiological narrowings.
91. Stomach: structure, ligaments, topography, blood supply, innervation, lymphatic drainage. X-ray anatomy.
92. Liver: external structure, fissures, and their contents, ligaments. The formation of the portal vein and hepatic veins.
93. Topography of the liver, its blood supply, innervation, lymphatic drainage.
94. Gall bladder: structure, blood supply, innervation. Bile ducts. On choletsistogramm to show the gallbladder and its parts.
95. The pancreas: structure, narrowing, topography, blood supply, innervation, lymphatic drainage.
96. Duodenum: parts, structure, topography, blood supply, innervation, lymphatic drainage. On duodenogramme to show parts of duodenum.

97. Jejunum and ileum: structure, topography, blood supply, innervation, lymphatic drainage.
98. Large intestine: parts, features of the walls structure, topography, blood supply, innervation, lymphatic drainage. On irrigogramme find colon to show haustrum, features their structure.
99. Rectum: parts, features of the walls structure, topography, blood supply, innervation, lymphatic drainage.
100. The walls of the cavities: abdominal, thoracic. Retroperitoneal space. Serous membrane of the chest cavity.
101. The boundaries of the upper, the lower floors of the abdomen and pelvis.
102. Parts of the peritoneal (abdominal) cavity: upper and lower floors, the pelvic cavity: bursas, side grooves, mesenteric sinuses, flanks.
103. Omental bursa: the walls, the omental (Winslow's) hole and the walls.

#### **Urinary and endocrine apparatus.**

104. The kidney: external and internal structure. Nephron as the structural and functional unit of the kidney. Age-related changes.
105. Features of the blood supply to the kidneys. Endocrine system of the kidneys, its role in the regulation of general and renal blood circulation.
106. Topography of the kidneys. On radiographs of the abdominal cavity to show the contours of the kidneys, to determine their localization.
107. Pyelocaliceal kidney complex.
108. Ureter: parts, narrowings, topographical features, blood supply and innervation. In urogram to show pyelocaliceal kidney complex. Determine the type of its structure.
109. Urethra. Blood supply, innervation, lymphatic drainage.
110. Bladder: structure, topography, blood supply, innervation, lymphatic drainage. On cystogram to find bladder to determine its location and shape.

111. The internal male sex organs: the structure, topography, blood supply, innervation, lymphatic drainage.
112. The testicle and spermatic cord: structure, topography, blood supply, innervation, lymphatic drainage.
113. Seminiferous ways (spermatic ways, spermatic ducts). Testicular appendages, their morpho-functional characteristics, participation in the process of maturation of male germ cells.
114. Ovary: structure, topography, blood supply, innervation, lymphatic drainage.
115. Ovulation. Ovarian cycle and its regulation. Evolution, structure and function of the corpus luteum during the cycle and in pregnancy. Age-related changes of the female reproductive system.
116. Uterus: structure, topography, blood supply, innervation, lymphatic drainage. X-ray anatomy.
117. Fallopian tubes: structure, topography, blood supply, innervation, lymphatic drainage. X-ray anatomy.
118. Vagina: structure, topography, blood supply, innervation, lymphatic drainage.
119. The glands of internal secretion: classification. The structure, topography, function, blood supply, innervation of certain glands.
120. The mammary gland. Development, features of the structure of the lactating and non-lactating glands. Regulation of lactation.

### **Central nervous system and sensory organs.**

121. The nervous tissue. Classification of neurons (morphological and functional). Structural and functional characteristics of neurons.
122. The nervous tissue. Morphofunctional characteristics. Sources of development. Nerve fibers. Morphofunctional characteristic myelin and unmyelinated nerve fibers. Myelination and regeneration of nerve fibers.

123. Neuroglia. Classification. The structure and importance of the various types of glial cells. Microglia.
124. The nerve endings. Classification, structure principles. The receptor and effector end, their morpho-functional characteristics.
125. The synapses. Classification, structure, mechanism of transmission of a nerve impulse in the synapses. Interneuronal synapses.
126. Simple and complex reflex arc. Neural theory. Scientists who developed the theory of the neural theory.
127. The nervous system. Classification (morphological and functional). The peripheral nervous system. Nerve. The structure and regeneration. Spinal ganglia. Morphofunctional characteristics.
128. The spinal cord: the external and internal structure, topography, blood supply. The neural structure. Sensory and motor paths of the spinal cord as examples of reflex arcs.
129. Brain: parts, the blood supply.
130. Hindbrain: parts and their structural elements. 4th ventricle: walls and communication.
131. The cerebellum. The structure and functional characteristics. The neural structure of the cerebellar cortex and glial cells. Interneuron connections.
132. The midbrain: external and internal structure.
133. Intermediate brain: parts, 2nd ventricle (wall and communication)
134. The cortex of the cerebral hemispheres. General morphofunctional characteristic. Embryogenesis. The neural organization of the cerebral cortex. Mieloarhitektonics. Age-related changes in the cortex.
135. Basal cell nuclei of the brain. Striopallidarnoy system. White matter. end Cavities of the endbrain (telencephalon) and their cjmmunications. Sulci and gyri of the hemispheres, the localization of cortical centers 1 and 2 signaling systems.



136. Olfactory brain: anatomical structure of the central and peripheral parts.
137. Membranes and the intermembranous space of the brain and spinal cord, subarachnoid cisterns.
138. Brain cavities.
139. The circulation of cerebrospinal fluid.
140. The conductive ways. The scheme of tracks of the common skin sensitivity.
141. The scheme of tracks of proprioceptive sensitivity to the cerebral cortex (Burdach's and Gault's tracks)
142. Proprioceptive tracks schemes to the cerebellum (the Gowers's and Flexing's tracks).
143. The concept of analyzers. Structure and cytophysiology of the receptor cells. Classification of of the sense organs. The organ of smell: structure, development, cytophysiology.
144. Eye. The structure of the main functional units of the eyeball, and age-related changes. Adaptive changes in the retina and the light in the dark.
145. The receptor apparatus of the eye. The photoreceptor cells. Neuronal structure and gliocytes of the retina. photoreception mechanism.
146. Dioptric and accommodative apparatus of the eye. The iris and ciliary body, structural features. Age-related changes.
147. The organ of taste. Blood supply, innervation, lymphatic drainage.
148. The organ of hearing. Morphofunctional characteristics. Blood supply, innervation, lymphatic drainage.
149. The organ of balance. The structure, development, function. Blood supply, innervation, lymphatic drainage.
150. Somatosensory analyzer.

### **Angiology and the immune system**

151. Classification of vessels. Development, structure, relationship of hemodynamic conditions and vascular structures. Principle of vascular innervation. Regeneration of vessels.
152. Heart: external structure; 3 circulation.
153. The structure of the heart wall and pericardium.
154. Heart: cameras, features of the structure of the right atrium.
155. The heart valves: the structure, the projection on the skeleton and place of hearing.
156. Heart Topography: golotopiya, skeletopy, Syntopy.
157. The cardiac conduction system.
158. In the X-ray organs of the sternal cavity in frontal projection to show the heart arcs.
159. Heart: blood circulation, lymph drainage and innervation.
160. General morphofunctional characteristic of the myocardium. Blood supply, innervation, lymphatic drainage.
161. Arteries. Morphofunctional characteristics. Classification, development, structure and function of the arteries.
162. The vessels of the microvasculature. Morphofunctional characteristics. Arterioles. Features of the structural organization and regulation of the arteriole activities.
163. The capillaries. Structure. Organ specific capillaries. The concept of blood-tissue barrier. Venules, and their functional significance and structure.
164. Arteriolo-venular anastomoses. Classification. The structure and function of different types of arteriolo-venular anastomoses. Value for circulation.
165. Veins. Features of the structure of different types of veins. Organ features of veins.
166. Aorta: parts, topography. The branches of the aortic arch.
167. Common and external carotid arteries. Topography, branches and areas of their blood supply.

168. Internal carotid artery: topography, branches. Arterial circle of the brain base.
169. Axillary artery: topography, branches and areas of their blood supply/
170. Subclavian artery: topography, branches and areas of their blood supply
171. The brachial artery (arteria brachialis), ulnar and radial artery: branches and areas of their blood supply.
172. Arterial arcs of hands: formation, topography, branches.
173. The branches of the thoracic and the abdominal aorta and the area of their blood supply. On aortogramme of the abdominal section of aorta to show its ramifications.
174. The bifurcation of the aorta, common, internal and external iliac arteries and their branches and areas of blood supply.
175. The femoral and popliteal artery: topography, branches and areas of their blood supply.
176. Arteries of the leg and foot: topography, branches and areas of their blood supply.
177. Ways of the venous blood outflow from the head and neck. The dural venous sinuses. The formation, inflows, and the topography of the superior vena cava.
178. The outflow of venous blood from the walls and of thoracic cavity organs.
179. The system of the portal vein: formation, topography.
180. The system of the inferior vena cava: formation, inflows and topography.
181. Superficial veins of the upper and lower limbs. Deep venous great vessels of limbs, regularities, topography of superficial and deep veins.
182. The anterior and posterior cava-caval anastomoses. Porto-caval anastomosis. The upper and lower porto-caval anastomosis.

183. The lymphatic system of the head and neck: the topography of nodes, lymph trunks and inflows.
184. The lymphatic system of the upper extremities: topography nodes, lymph trunks and inflows.
185. Lymph outflow from the walls of the thoracic and abdominal cavities topography of lymph nodes, lymph trunks and inflows.
186. The lymphatic system of the lower extremity and pelvis: the topography of the lymph nodes, lymph trunks and inflows.
187. The thoracic duct: formation, topography. The right lymphatic duct: formation, topography.
188. The structural elements, age features and functions of the immune system.
189. Thymus. The structure and functional significance. Blood supply, innervation, lymphatic drainage.
190. Spleen. The structure and functional significance. Blood supply, innervation, lymphatic drainage.
191. The structure and functional significance of lymph nodes and lymphoid nodules of mucous membranes of various organs.

#### **The peripheral and autonomic nervous system.**

192. III, IV, V, VI pairs of cranial nerves: the nuclei, topography, areas of innervation.
193. VII, VIII pair of cranial nerves: the nuclei, topography, areas of innervation.
194. X pair of cranial nerves: the nuclei, topography, areas of innervation.
195. XI, XII pairs of cranial nerves: the nuclei, topography, areas of innervation.
196. The motor nuclei of cranial nerves. Areas of innervation. Sensitive nuclei of cranial nerves. Areas of innervation. Vegetative nuclei of cranial nerves. Areas of innervation.

197. Output area (entrance) from the brain and skull I-XII pairs of cranial nerves.
198. Scheme of the spinal nerve and its 5 branches, the composition of the fibers, and the area of their innervation.
199. The formation and topography of plexus.
200. The cervical plexus: formation, topography. The branches and areas of innervation.
201. Brachial plexus: formation, topography. Short branches and areas of innervation.
202. The radial nerve: topography, areas of innervation.
203. The median nerve: topography, areas of innervation.
204. The ulnar nerve: topography, areas of innervation.
205. The musculocutaneous nerve: topography, areas of innervation.
206. The axillary nerve: topography, areas of innervation.
207. The innervation of the muscles of the upper limb.
208. The innervation of the skin of the upper limb.
209. The intercostal nerves: topography, areas of innervation.
210. The lumbar plexus: formation, topography. The obturator nerve: topography, areas of innervation.
211. The iliohypogastric and ilioinguinal nerves: topography, areas of innervation.
212. The femoral and genitofemoral nerves: topography, areas of innervation.
213. The sacral plexus: formation, topography. Short branches and areas of innervation.
214. The sciatic nerve: topography, areas of innervation. The branches of the sciatic nerve, their topography and regions of innervation.
215. The innervation of the muscles of the lower limb.
216. The innervation of the skin of the lower limb.

217. The sympathetic division of the ANS: central and peripheral units. Sympathetic trunk (truncus sympathicus).
218. The parasympathetic divisions of the ANS: central and peripheral units.
219. Vegetative abdominal plexus: formation, topography, areas of innervation.

## **Tasks for the exam**

### **Nervous system**

1. The patient is necessary to conduct a spinal tap. At what vertebral level you may conduct it, to do not damage the spinal cord? \***L4-L5 vertebrae.**
2. The patient has a fracture at the level of 4<sup>th</sup> thoracic vertebra. Which segment of the spinal cord can be damaged? \* **Medulla oblongata**
3. The patient after giving large amounts of cerebrospinal fluid has occurred sudden cardiac arrest and breathing. Explain the reason for this complication. \* **Dislocation of the in the big hole.**
4. The patient has the breached body's equilibrium. What part of the cerebellum could be associated with these vestibular disorders? \* **Vormis cerebelli.**
5. The patient complains of violation the motor function of limbs. What parts of the cerebellum can be damaged? \* **Cerebellar hemispheres**
6. The patient complains of an intense thirst, a passion for food and copious urination. Which departments of an intermediate brain can be affected? \***Hypothalamus.**
7. During examination of the patient neurologist found a violation of convergence and eye movements upward and downward. What part of the brain could be affected? \***Mesencephalon, regio corporae quadrigeminae**
8. The patient complained of insomnia during the week. What part of the brain can be impressed? \* The right brain and the thalamus.

9. The patient has been diagnosed an inflammatory process of the arachnoid brain tunic. Through what structure is possible infiltration of the infected cerebrospinal fluid from the the subarachnoid space into the cavities of the brain ventricles. \* **Through the the holes Lyushka and Mazhendi.**
10. The patient has a head injury originated epidural hematoma, explain its localization and morphological conditions arise. \* **A hematoma is localized between the dura and the periosteum, originated at fracture of glassy plates of the cranial vault bones.**
11. After the brain hemorrhage, the patient has been developed paralysis of the lower limbs. Which center in the cerebral cortex injured? \***The center of the motor analyzer ascending frontal convolution**
12. After the brain hemorrhage, the patient has been developed paralysis of the lower limbs. What center in the cerebral cortex is injured? \***The center of the motor analyzer ascending frontal convolution.**
13. In a patient doctor diagnosed neuritis (inflammation) of the trigeminal nerve. What would bother the patient with inflammation of I, II, III branches of the nerve? \* **Strong pain - neuralgia**
14. In a patient during the inspection of the throat with a spatula occurs emetic reflex. Which pair of sensitive branches is irritated? \***X pair – nervus vagus and XII pair – nervus hypoglossius**
15. The patient has a marked asymmetry of the face. What nerve is affected?\* **VII pair – Nervus facialis**
16. After making of operative interference on the neck, in a patient voice gone. What nerve is damaged during the operation? \* **Nervus laryngeus recurrens**
17. Which nerve is damaged, if on the patient examination was revealed marked deviation of the tongue tip to the left? \***XII pair – nervus hypoglossius sinicter.**

18. The patient has a nasal voice, choking while eating (ie when swallowing food enters the larynx). What nerve is damaged? \***X pair – nervus vagus.**

19. What disorders of the limb functions can be expected in case of the radial nerve damage at the place of its formation? \* Motor deficit:

- **Loss of extension of forearm, weakness of supination, and loss of extension of hand and fingers.**
- **Presence of wrist drop, due to inability to extend the hand and fingers.**
- **Sensory deficit: Loss of sensation in lateral arm, posterior forearm, the radial half of dorsum of hand, and dorsal aspect of radial 3 ½ digits, excluding their nail beds.**

20. Which nerve is damaged, if the patient has lost the sensitivity of the skin of the medial edge of the palm, V and IV fingers? \* **Nervus ulnaris**

21. What part of the the autonomic (sympathetic and parasympathetic) system is irritated in tachycardia? \* **The sympathetic part.**

22. The patient has constricted pupils, bradycardia (heart rate less 60 beats per minute), lacrimation and salivation, dry skin. What part of the autonomic system function predominates? \* **Parasympathetic divisions**

23. What system (the animal or vegetative) controls: a) an involuntary (autonomic) sphincter of the bladder? b) the voluntary sphincter of the bladder? \* **A) - vegetative; b) - the animal**

## **Органы чувств**

### **Sensory organs**

24. During developing pituitary tumor patient lost vision in both eyes. At what level the tumor has damaged the optic pathway? \***The level of chiasma opticum**

25. In the left optic nerve injury suffered before the chiasm. What happens with the visual function? \***Blindness on the left eye**

26. Why is it necessary to open a mouth in a planned explosion? \* **To expand the pharyngeal opening of the auditory tube.**

27. Why sometimes is it necessary to puncture of the eardrum in inflammation of the middle ear? \* **For the outflow of fluid.**



28. The child has converging strabismus. What nerve is damaged? \***VI cranial nerve – nervus abducens.**

### **The cardiovascular (circulatory) system**

29. During an emotional excitement heart rate reached 112 per minute in a human of 30 years. Which part of the cardiac conduction system is responsible for this change? \***Sinoatrial node**

30. A newborn was diagnosed developmental disorder ventricular myocardium. What is the source of embryonic development is disrupted? \***Visceral splanhnopleura**

31. The patient has the mitral valve which does not completely close the left atrioventricular opening. In what direction, will move the blood during systole of the left ventricle? \* **In two directions: into the aorta and the left atrium**

32. Patient has tricuspid valve which does not completely close the right atrioventricular opening. In what direction, will move the blood during systole of the right ventricle? \* **In two directions: in the pulmonary trunk and the right atrium.**

33. During a cancer operations on the tongue it was necessary to ligate the right lingual artery. At what topographical formation of the neck is necessary to carry out this manipulation? \* **In the triangle Pirogov.**

34. Because of the injury of the skull base a bone displacement of the large foramen edges occurred. What branches of the subclavian artery can be damaged? \* **Middle meningeal artery.**

35. On examination of the ocular fundus ophthalmologist discovered in the patient a retinal hemorrhage. What artery damage did cause bleeding? \* **The central retinal artery.**

36. Because of the injury of the skull base a bone displacement of the large foramen edges occurred. What branches of the subclavian artery can be damaged? \* **Vertebral arteries.**

37. The patient has complaints about hyperemia and swelling in the lower leg and foot. What lymph nodes must be palpated the doctor? \* **Popliteal and inguinal.**

38. The surgeon conducts the operation for breast cancer. What lymph nodes should be removed? \* **The axillary lymph nodes.**

### **Endocrine system**

39. A woman of 53 years, height 163 cm, weight 93 kg, has the uniform deposition of fat, puffy face, is inactive, apathetic. What gland dysfunction can be caused by the patient's condition? \* **Thyroid gland**

40. The X-ray study of the bones of the skull base revealed an increase in Turkish saddle cavity, the destruction of different parts of the sella. Which endocrine gland tumor can cause a destruction of bones? \* **Pituitary gland**

### **Respiratory system**

41. The sharp decrease in the activity of the lung surfactant was found in a patient. What changes can be expected in this patient? \* **The tendency of alveoli to stick and the impossibility of their quickly unfolding**

42. The syndrome of respiratory insufficiency is common in preterm infants. What is the most likely cause of this? \* **Underdevelopment of the pulmonary alveoli due to a lack of surfactant.**

43. In histological preparation is presented organ, the wall of which consists of a mucosa, submucosa, fibro-cartilage and adventitia tunics. Multirowed ciliated epithelium, lamina muscularis of mucosa is absent, in the submucosa - protein-mucous glands, hyaline cartilage forms an open ring. What organ has these morphological characteristics? \***Trachea**

### **Digestive system**

44. If a person is excreted not enough thick saliva with reduced enzyme activity and increase in the content of mucus. What is the most likely cause of this dysfunction? \* **Parotid gland.**

45. In a maternity home during the first feeding of the newborn it has been observed continuous leakage of milk from the nose. What kind of malformations may indicate this symptom? \***Cleft palate.**

### **Urogenital System**

46. In preparation of ovarian the circular formation was detected with diameter about 5 cm, which comprises a yellow pigment. From which cell is this formation? \***Luteal**

### **Sample of examination card**

1. Features of the form and function of the joints.
2. Liver: external structure, fissures, and their contents, ligaments. The formation of the portal vein and hepatic veins.
3. Nerve endings. Classification, structure principles. The receptor and effector endings, their morpho-functional characteristics.

### **The card included questions from different sections of the subject:**

1. The first question - from the section "Osteology"
2. The second question - from the section "Splanhnologiya"
3. The third question - from the section "Nervous system"

### **Criteria exam evaluation**

1. Evaluation of "**excellent**" means:
  - Complete and accurate answers to 3 questions examination card
  - Fluency in the basic terms and concepts of the course
  - Consistent and logical presentation of the course material;
  - Completed conclusions and generalizations on questions;

- Exhaustive answers to the questions in the exam;
2. Evaluation of "**good**" means:
    - Complete and accurate answers to 3 questions examination card
    - Knowledge of the basic terms and concepts of the course;
    - Consistent presentation of course material;
    - Ability to formulate certain generalizations on questions;
    - Enough complete answers to the questions in the exam;
  3. Evaluation of "**satisfactory**" suggests:
    - Complete and accurate answers to 2 questions examination card
    - Satisfactory knowledge of basic terms and concepts of the course;
    - Satisfactory knowledge and ability to use problem-solving methods and tools;
    - Lack of consistent presentation of course material;
    - Ability to formulate some conclusions and generalizations on questions;
  4. Evaluation of "**unsatisfactory**" suggests:
    - Complete and accurate answer to one question of examination card and less

### **Evaluation criteria of oral answer, colloquia**

"**5 scores**" to the students, if he on the discussed questions giving the right answers with different depth and completeness of disclosure topics, can make conclusions and generalizations to give reasoned answers that are logical and consistent.

"**4 scores**" to the students, if he on the discussed questions giving the right answers with different depth and completeness of disclosure topics, can make conclusions and generalizations, but it is allowed one - two errors in the answers.

"**3 scores**" to the students, if he on the discussed questions giving answers that disclose it insufficiently, there is no logical structure response, admits a few mistakes.

"2 scores" to the students, if he on the discussed questions giving answers that show ignorance of the material, and he also can not give reasoned answers and has serious errors in the content of the response.

### **Evaluation tools for the current attestation**

**Control tests** are designed for the students studying the course "Human Anatomy".

The tests are necessary for the control of knowledge during the current interim attestation, and for the evaluation of knowledge and thus to get credit for course.

While working with tests the student are asked to select one answer from the three - four proposed. At the same time the tests are not identical in their complexity.

Offered tests contain several variants of correct answers. The student must select all the correct answers.

The tests are designed both for individual and collective solving them. They can be used in the process both classroom lessons and independent work. The tests, required for the control of knowledge, are chosen in the process of the intermediate certification by each teacher individually.

The results of the test tasks are evaluated by a teacher on a five-mark grading scale or system of "**credit**" - "**not credit**".

Evaluation of "**excellent**" is got by student at the correct answer to more than 90% of the proposed tests.

Evaluation of "**good**" getting - at the correct answer by more than 70% of tests.

Evaluation of "**satisfactory**" - at the correct answer to 50% of the offered tests

## TEST TASKS ON SUBJECT "HUMAN ANATOMY"

### Subject: Artrosindesmology

1. **What Anatomy section studies the connection of bones?**
  - a. osteology
  - b. **artrosindesmologiya**
  - c. myology
  - d. splanhnologiya
2. **How is called the continuous connection of bones?**
  - a. **synarthrosis**
  - b. symphysis
  - c. diarthrosis
  - d. arthrosis
3. **What kind of tissue forms the basis of synchondrosis?**
  - a. loose connective tissue
  - b. heavy connective tissue
  - c. **cartilaginous tissue**
  - d. bone tissue
4. **What kinds of syndesmoses occur only between the bones of the skull?**
  - a. ligament
  - b. membrane
  - c. **suture**
  - d. welding
5. **What bones' connections are the most moving?**
  - a. syndesmosis
  - b. synostosis
  - c. symphysis
  - d. **diarthrosis**
6. **What does cover articular surfaces?**
  - a. **articular cartilage**
  - b. synovial membrane

- c. articular lip
- d. articular ligament

**7. How many articular surfaces has a simple joint?**

- a. one
- b. two**
- c. three
- d. any number

**8. What is in articular cavity?**

- a. air
- b. lymph
- c. synovial fluid**
- d. nothing contains

**9. What joints have articular disc?**

- a. shoulder**
- b. hip**
- c. elbow
- d. knee**

**10. How is called the movement around the frontal axis?**

- a. flexion-extension**
- b. abduction-adduction
- c. rotation
- d. circular rotation

**11. What joints are biaxial?**

- a. hinge
- b. pivot
- c. saddle**
- d. ball-and-socket
- e. gliding
- f. ellipsoid**

**12. What form has the temporomandibular joint?**

- a. **hinge**
- b. pivot
- c. saddle
- d. ball-and-socket
- e. gliding
- f. **ellipsoid**

**13. What ligaments do connect the vertebrae arc?**

- a. **yellow ligament**
- b. nuchal ligament
- c. posterior longitudinal ligament
- d. tectorial membran

**14. What form has brachioradialis joint?**

- a. hinge
- b. pivot
- c. saddle
- d. **ball-and-socket**
- e. gliding
- f. ellipsoid

**15. Which joints of the lower limb are multiaxial?**

- a. **hip joint**
- b. knee joint
- c. ankle joint
- d. tarsometatarsal joint

**16. What sections of the vertebral column have physiological lordosis?**

- a. **cervical**
- b. thoracic
- c. **lumbal**
- d. sacral

**17. Around which axes are possible movements in the knee joint?**

- a. axis frontalis et sagittalis



- b. axis sagittalis et verticalis
- c. axis verticalis et frontalis**
- d. axis frontalis et obliques

### Miology

- 18. Smooth muscles are part of:**
- a. **the walls of the intestine.**
  - b. the walls of the heart chambers.
  - c. tongue.
  - d. throat.
- 19. The gastrocnemius muscle is:**
- a. **biceps.**
  - b. three-headed.
  - c. digastric.
  - d. quadriceps
- 20. The main features of the facial muscles are:**
- a. small size.
  - b. **the circular arrangement of fibers.**
  - c. attaching by one end to the bones.
  - d. the multiplicity of sources of blood supply.
- 21. Abdominal muscles are**
- a. serratus anterior muscle.
  - b. **rectus abdominis muscle.**
  - c. psoas major.
  - d. diaphragm.
- 22. Flexors of the hip joint are:**
- a. gluteus maximus muscle.
  - b. abdominal external oblique muscle.
  - c. **quadriceps femoris muscle.**
  - d. gastrocnemius muscles.

**23. Muscles-antagonists are:**

- a. located on the flexor surface.
- b. producing an opposite movement in the joints.**
- c. acting on 2 - 3 joint.
- d. producing a synchronous movement of the limbs.

**24. Postural muscles are:**

- a. muscles, spine extensors.**
- b. intercostal muscles.
- c. muscles of the upper limb.
- d. large pectoral muscle.

**25. The muscle that can both tilt and throw back his head:**

- a. deltoid muscle.
- b. trapezoid muscle.**
- c. sternoclavicular-mastoid muscle.
- d. scalene muscle.

**Respiratory system**

**26. The nasal cavity has parts:**

- a. cavernous part.
- b. concheal part.**
- c. olfactory part.
- d. ptarmic part.

**27. Middle nasal passage is:**

- a. on both sides of the nasal septum.
- b. between the inferior and middle conchae.**
- c. in the vestibule of the nasal cavity.
- d. between the upper and inferior conchae

**28. Maxillary sinus opens:**

- a. in the upper nasal meatus.
- b. in the inferior nasal meatus e.
- c. in the middle nasal meatus.**

d. in the frontal sinus.

**29. The frontal sinus is opened:**

a. in the upper nasal meatus.

**b. in the middle nasal meatus.**

c. in the sphenoid sinus

d. at the base of the nasal septum.

**30. What the cartilage is composed of elastic cartilage tissue:**

a. cricoid cartilage.

b. thyroid cartilage.

**c. the epiglottis**

d. arytenoid cartilage

**31. Tracheal skeleton consists of:**

a. 10 - 15 cartilaginous half-rings.

**b. 16 - 20 cartilaginous rings.**

c. 16 - 20 cartilaginous plates.

d. 16 - 20 cartilaginous half-rings.

**32. The right main bronchus is divided into:**

a. two branches.

**b. three branches.**

c. seven branches.

d. more than 10 branches.

**33. Lung gates (hilum) are:**

a. on the diaphragmatic surface.

**b. on the medial surface.**

c. in the top of the lung.

d. on the front-side surface.

**34. Cardiac notch of lungs located:**

a. in the upper part of the anterior edge of the left lung.

**b. the lower part of the front edge of the left lung.**

c. on the medial surface of the right lung.

d. in the apex of the right lung.

**35. The left and right pleural cavity:**

- a. fully insulated
- b. communicated with each other during inhalation.
- c. communicated with each other during exhalation.
- d. communicated through tracheal.

**36. Ciliary epithelium is missing:**

- a. in the trachea.
- b. in the alveoli.**
- c. in the larynx.
- d. in the nasal cavity

**Digestive system**

**37. There are involved in the formation of the proper oral cavity wall:**

- a. the hyoid bone.
- b. vomer.
- c. muscles of cheeks.**
- d. the alveolar process of the mandible.

**38. The dental formula of adult is designated as:**

- a. 1-2-3-3.
- b. 2-3-1-2.
- c. 2-1-2-3.**
- d. 3-1-3-2.

**39. The most numerous papillae of tongue are:**

- a. fungiform.**
- b. vallate.
- c. foliate.
- d. filiform

**40. The duct of parotid gland opens:**

- a. at the base of tongue.
- b. in the soft palate.

- c. **on the inner wall of the cheek near the upper second large molar.**
- d. on the inner wall of the cheek near the upper canines.

**41. Folds of the esophageal mucosa have a direction:**

- a. **longitudinal.**
- b. helix.
- c. ring.
- d. folding absent.

**42. Hydrochloric acid is produced by glands of the stomach:**

- a. cardiac glands.
- b. **fundic glands**
- c. intermedial
- d. pyloric glands

**43. What parts of the digestive tract have a mesentery?**

- a. **sigmoid colon.**
- b. duodenum.
- c. descending colon.
- d. esophagus.

**44. What parts of digestive tract have villi?**

- a. esophagus.
- b. transverse colon.
- c. stomach.
- d. **ileum**

**45. Muscular layer of the small and large intestine differs:**

- a. the amount of muscle layers.
- b. **the features of the structure of the longitudinal muscle layer.**
- c. the size of muscle cells.
- d. there is no difference.

**46.. Digestive organs located mesoperitoneally:**

- a. stomach.
- b. ileum.

c. **duodenum.**

d. transverse colon.

**47. The duct of the gall bladder is opened to:**

a. duodenum.

b. stomach.

c. in the right hepatic duct.

d. **in the common hepatic duct.**

**48. Islets of Langerhans are in:**

a. liver.

b. the wall of the stomach.

c. **pancreas.**

d. small gland.

**49. Peritoneal cavities men and women differ:**

a. **in men sealed, in women - no.**

b. woman has in the cavity more serous fluid.

c. men have less volume, than women.

d. no differences

**50. Lymph plaques (Peyer) exist in:**

a. esophagus.

b. stomach.

c. **sigmoid colon.**

d. jejunum.

**51. Ileocecal valve is located between:**

a. esophagus and stomach.

b. duodenum and jejunum.

c. **ileum and colon.**

d. sigmoid intestine and colon.

**52. Glisson's capsule covers:**

a. pancreas.

b. esophagus.

- c. stomach.
- d. **liver.**

### Urinary system

**53.The kidneys are located:**

- a. on the level of the middle thoracic vertebrae.
- b. at the level of the 8<sup>th</sup> thoracic and the 1<sup>st</sup> lumbar vertebrae.
- c. **at the level of the 12<sup>th</sup> thoracic - 1<sup>st</sup> -2<sup>nd</sup> lumbar vertebrae.**
- d. on the right and left of the sacrum.

**54.The right and left kidney:**

- a. located on the same level.
- b. **right below the left.**
- c. the left below the right.
- d. there is no reliable information

**55.The kidney is surrounded by:**

- a. muscular layer from all sides.
- b. **fat capsule.**
- c. peritoneum.
- d. serous fluid.

**56.What kidney's structures open into the renal pelvis?**

- a.convoluted tubules of the nephron.
- b.the collecting tubules.
- c.**small calyces of pelvis**
- d. **large calyces of pelvis**

**57.Ureteral of an adult has a length of approximately:**

- a. 10-15cm.
- b. 16-20sm.
- c. **25-30cm.**
- d. 50-60cm

**58.Urine travels through the ureter:**

- a. contraction of the ureter muscles.

- b. contraction of pelvic wall.
- c. **gravity.**
- d. abdominal pressure

**59. What anatomic formations are located at the trigone of bladder (vesical trigone)?**

- a. the openings of the ureters and renal pelvis.
- b. the external opening of the urethra.
- c. the internal urethral opening, and pelvis.
- d. **the openings of the ureters and the inner opening of the urethra.**

**60. What is the length of the urethra in women?**

- a. 0.5-1 cm
- b. 1-2cm.
- c. **3-6 cm.**
- d. 8-10 cm.

**61. What anatomic formations are opened in the male urethra?**

- a. **the ducts of the seminal vesicles.**
- b. ejaculatory duct.
- c. the ureters.
- d. the ducts of the epididymis.

**62. The testes during embryogenesis being laid:**

- a. in the scrotum.
- b. in the inguinal canal.
- c. **the abdominal cavity.**
- d. in the cavernous bodies of the penis

**63. Testis (Testicle) consists of:**

- a. 1-2 lobules.
- b. 10-15 lobules.
- c. 1000 lobules.
- d. **100-300 lobules.**

**64. Bulbourethral (Cowper's) glands are located:**



- a. over the prostate gland.
- b. in the thick the corpus cavernosum.
- c. in the thick the urogenital diaphragm.
- d. on both sides of the bladder.**

**65. The shortest part of the male urethra is:**

- a. cystic.
- b. prostate.
- c. spongy.
- d. membranous.**

**66. The internal female sex organs are.**

- a. vaginal part of cervix uteri.**
- b. labia minora (small lips of pudendum).
- c. the clitoris.
- d. vestibule glands (Bartholin).

**67. Ovary:**

- a. has the mesentery.
- b. lay intraperitoneally.**
- c. covered with fat capsule.
- d. covered with a fibrous capsule.

**68. What anatomic formations are absent in the wall of the uterus?**

- a. endometrium.
- b. myometrium.
- c. sclerometrium.**
- d. perimetrium

**69. What anatomic formations are absent in the fallopian tube?**

- a. neck.**
- b. isthmus.
- c. funnel.
- d. ampoule.

## Circulatory system

**70. What anatomic formations are not part of the walls of the heart chambers?**

- a. endocardium.
- b. pericardium.
- c. myocardium.
- d. epicardium.**

**71. The oval hole (fovea) is in the heart:**

- a. between the left and right ventricles.
- b. between the left atrium and left ventricle.
- c. between the right and left atria**
- d. between the left atrium and the right ventricle.

**72. The thickness of the walls of the atria:**

- a. same.
- b. left thicker.
- c. right thicker
- d. there is no information.

**73. Which vessel opens into the right atrium?**

- a. superior vena cava.**
- b. middle vena cava.
- c. jugular vein.
- d. pulmonary vein

**74. What vessels open into the left atrium?**

- a. the pulmonary artery.
- b. pulmonary veins.
- c. coronary artery.
- d. carotid artery.

**75. Atrioventricular valves have the structure:**

- a. equally on the left and the right.
- b. on the left - 3 cusps, on the right - 2 cusps.

c. **on the right - 3 cusps, on the left - 2 cusps.**

d. on the right absent tendon chords.

**76. During atrial systole:**

a. all the valves are open.

b. **open atrioventricular and semilunar closed.**

c. right semilunar open and left semilunar closed.

d. atrioventricular valves are closed.

**77. Myocardium of the atria and ventricles:**

a. **constitute a single whole.**

b. disunited.

c. have a different structure of myocytes.

d. left atrial myocardium smoothly into the ventricular myocardium.

**78. The cardiac conduction system is:**

a. heart artery system.

b. cardiac capillary system.

c. the system of heart valves.

d. **the system providing the heart of the automaton.**

**79. The bundle of His is:**

a. **part of the conduction system.**

b. part of the muscle fibers in the right ventricle.

c. part of the muscle fibers in the left atrium.

d. part of the tendon strands in the left heart.

**80. Coronary arteries start from:**

a. the aortic arch.

b. the thoracic aorta.

c. the subclavian artery.

d. **the bulbs of aorta.**

**81. Coronal veins open in:**

a. the superior vena cava.

b. the inferior vena cava.

- c. **the right atrium.**
- d. the jugular vein.

**82.The wall of the artery includes:**

- a. **tunica intima (endothelium).**
- b. **tunica adventitia (loose connective tissue).**
- c. **tunica media (muscle tissue).**
- d. tunica intermedia (epithelium).

**83.The arterioles are:**

- a. arteries, forming bridges between the vessels.
- b. arteries diameter of about 1cm.
- c. arteries deprived of adventitia.
- d. **arteries diameter up to 0.1 cm.**

**84.The aorta is the vessel of the:**

- a. muscle type.
- b. mixed type.
- c. **elastic type.**
- d. tubular type.

**85.The left common carotid artery arises from the:**

- a. bulb of aorta.
- b. **aortic arch.**
- c. subclavian artery.
- d. brachiocephalic trunk.

**86.What arteries are branches of the thoracic aorta?**

- a. **esophageal artery.**
- b. the internal carotid arteries.
- c. brachiocephalic trunk.
- d. coronary artery.

**87.What arteries are branches of the abdominal aorta?**

- a. pericardial artery.
- b. **renal artery.**

- c. intercostal artery.
- d. splenic artery.

**88. Portal vein carries blood:**

- a. from the stomach to the inferior vena cava.
- b. from the liver gate into the inferior vena cava.
- c. **from the intestine to the liver gate**
- d. from the kidney gate into the inferior vena cava.

**89. The blood supply of the brain is involved:**

- a. **vertebral artery.**
- b. the external carotid artery.
- c. the upper intercostal artery.
- d. the arterial fetal canal.

**Nervous system**

**90. What types of neurons are in the gray matter of the spinal cord and the brain?**

- a. pseudounipolar neurons.
- b. the bipolar neurons.
- c. **multipolar neurons.**
- d. unipolar neurons.

**91. Cervical section of the spinal cord has:**

- a. 6 segments.
- b. 7 segments.
- c. 10 segments.
- d. **8 segments.**

**92. Posterior roots of the spinal cord are:**

- a. motor.
- b. **sensory**
- c. sympathetic.
- d. parasympathetic.

**93.The spinal cord ends at the level of:**

- a. 11-12 thoracic vertebrae.
- b. **1-2 lumbar vertebrae.**
- c. 3-4 lumbar vertebrae.
- d. 1-2 sacral vertebrae

**94.Sympathetic spinal nuclei are:**

- a. **in the lateral horns.**
- b. in the anterior horns.
- c. in the posterior horns.
- d. in anterior cord

**95.The arachnoid mater of the spinal cord is located:**

- a. between the dura mater and the periosteum of the vertebrae.
- b. **between the dura mater and the pia mater.**
- c. between pia mater and spinal cord, and the spinal cord.
- d. included into the structure of the pia mater

**96.The nuclei of the trochlear and abducens nerves are:**

- a. **motor.**
- b. sensory.
- c. sympathetic.
- d. mix.

**97.The nuclei of the cerebellum are:**

- a. ambiguous nucleus.
- b. vagus nerve nucleus.
- c. **emboliform nucleus**
- d. Edinger–Westphal nucleus

**98.Cavity of the rhombencephalon is:**

- a. the third ventricle.
- b. **the fourth ventricle.**
- c. sylvain aqueduct.
- d. the second ventricle.

**99. Midbrain cavity is:**

- a. the fourth ventricle.
- b. the third ventricle.
- c. the lateral ventricles.
- d. **Sylvain aqueduct**

**100. The gray matter of the mesencephalon (midbrain) is represented by:**

- a. red nucleus.
- b. **the nucleus of the trigeminal nerve.**
- c. the medial lemniscus.
- d. the lateral lemniscus

**101. The upper (front) quadrigemina colliculi associated with:**

- a. olfactory function.
- b. **visual function.**
- c. the function of the sense of touch
- d. the function of the hearing

**102. Black midbrain substance (substantia nigra) is part of:**

- a. pyramidal system.
- b. limbic system.
- c. **extrapyramidal system.**
- d. hypothalamic-pituitary system.

**103. The thalamus is the highest subcortical:**

- a. motor centers.
- b. **sensory center.**
- c. sympathetic centers.
- d. parasympathetic center

**104. The lateral geniculate body is a structure:**

- a. olfactory sensory system.
- b. gustatory system.
- c. **visual sensory system.**
- d. auditory system.

**105. The cavity of the diencephalon is:**

- a. the fourth ventricle.
- b. the third ventricle.**
- c. Sylvain aqueduct.
- d. the lateral ventricles.

**106. The basal nuclei of the cerebral hemispheres are:**

- a. red nucleus.
- b. caudate nucleus.
- c. oliva.
- d. the nuclei of the roof.

**107. The basal nuclei of the cerebral hemispheres are:**

- a. red nuclei.**
- b. caudate nucleus.
- c. oliva.
- d. the nuclei of the roof.

**108. Pyramid path is:**

- a. ascending
- b. descending.**
- c. associative
- d. callosal.

**109. Central (Rollandova) sulcus separates:**

- a. frontal and parietal lobes.**
- b. frontal and occipital lobes.
- c. parietal and occipital lobes.
- d. occipital and temporal lobes.

**110. There are in the cerebal cortex:**

- a. 3 layers of cells.
- b. 6 layers of cells.**
- c. 8 layers of cells.
- d. 10 layers of cells.



## Sense organs.

### 111. The eyeball has tunicae:

- a. **fibrous**
- b. soft
- c. supports
- d. solid

### 112. Anterior camera of the eye is:

- a. between the lens and the vitreous body.
- b. between the cornea and lens.
- c. **between the cornea and iris.**
- d. between the cornea and vitreous.

### 113. In the blind spot of the retina:

- a. **there are no receptors.**
- b. the receptors are extremely rare.
- c. there are only rods.
- d. there are only cones.

### 114. The rods and cones are located:

- a. in the inner layer of the retina.
- b. in the middle layers of the retina.
- c. regularly distributed throughout its thickness.
- d. **in the outer layer of the retina.**

### 115. Meibomian gland:

- a. located in the outer corner of the eye.
- b. located in the thickness of the conjunctiva.
- c. **located at the rim of the eyelids.**
- d. located in the lacrimal ducts.

### 116. What anatomic formations are the parts of the middle ear?

- a. **the tympanum.**
- b. the earlobe.
- c. canales semicircularis ossei

d. osseous labyrinth

**117. The auditory (Eustachian) tube connects:**

- a. the cavity of the external auditory meatus with the nasal cavity
- b. the cavity of the middle ear to the nasopharynx.**
- c. the cavities of the semicircular canals with tympanic cavity.
- d. the cavity of the cochlea with the cells of the mastoid process.