

SYLLABUS
concerning the cycle of education 2020-2026

1.1. BASIC INFORMATION CONCERNING THIS SUBJECT

Subject / Module	Anatomy
Course code / module *	A/A
Faculty of (name of the leading direction)	Faculty of Medicine, University of Rzeszow
Department Name	Department of Correct Anatomy
Field of study	Medical
Level of education	Uniform Master studies
Profile	General academic
Form of study	Stationary / non-stationary
Year and semester	1st year, 1st semester
Type of course	Obligatory
Coordinator	Professor dr hab. n. med. Stanisław Orkisz,

* - According to the resolutions of the Faculty of Medicine

1.2. Forms of classes, number of hours and ECTS

Lecture	Exercise	Conversation	Laboratory	Seminar	ZP	Practical	Self-learning	Number of points ECTS
30	45	-	-	25	-	-	15	11

1.3. The form of class activities

☒ classes are in the traditional form

☒ classes are implemented using methods and techniques of distance learning

1.4. Examination Forms / module (exam, credit with grade or credit without grade)

2. REQUIREMENTS

Knowledge about the structure and functioning of the human body at the high school level.

3. OBJECTIVES, OUTCOMES, AND PROGRAM CONTENT USED IN TEACHING METHODS

3.1. Objectives of this course/module

C1	Understanding the detailed anatomical structure of the human body based on descriptive anatomy, which divides the human body into particular systems considered in sequence: bone muscle, digestive, respiratory, urogenital, internal, vascular, nervous, common and sensory organs.
C2	Understanding correct human body structure, determines the functions of organs, systems and the organism as a whole. Dynamic development of imaging techniques of human body structures; radiology, computed tomography, magnetic resonance imaging and others that enable the visualization of structures and the interpretation of topographical relations between them, requires knowledge of normal anatomy. The student of the medical faculty, having knowledge in all the above-mentioned areas, acquires the ability to interpret the construction of the living subject to a degree that enables understanding of clinical issues and is prepared to the extent necessary to expand it in subsequent years of study and informed practical medical practice.

3.2 OUTCOMES FOR THE COURSE / MODULE (TO BE COMPLETED BY THE COORDINATOR)

EK (the effect of education)	The content of learning outcomes defined for the class (module)	Reference to directional effects (KEK)
EK_01	knows anatomical appointments in Polish and English	A.W1
EK_02	knows the structure of the human body in the topographical aspect	AW2
EK_03	has detailed knowledge of the structure of the macroscopic organs of the circulatory system, respiratory system, digestive system, urinary system, genital system, sensory organs and the shell of the common body	A.W2
EK_04	has knowledge of the structure and structural-functional correlation of the osteoarticular and muscular system	A.W2
EK_05	describes topographical relations between individual organs knows basic functional systems, their specialization, connections and symptoms of damage	A.W3
EK_06	can explain the anatomical basis of the physical examination (the site of the valves and points of their auscultation, the boundaries of the lungs and the pleura, the pupillary reflex)	A.U3
EK_07	defines, recognizes and indicates relations between anatomical structures in the documentation of life-long imaging of structures, especially in the field of radiology and imaging diagnostics	A.U4
EK_08	uses in speech and writing anatomical terms	A.U5

3.3 CONTENT CURRICULUM (filled by the coordinator)

Problems of the lecture

Course contents

Lecture 1

Organization of anatomy classes.

Anatomy in a historical perspective

Practical classes, rules of conduct

Conditions for passing classes, colloquia, practical and test exams, textbooks

Basic anatomical terms; axes, body lines, planes, body regions

Lecture 2

The concepts of cell, tissue, organ, system

Tissue characteristics, examples of occurrence

Organ systems: divisions taking into account morphological, topographical, developmental and clinical criteria

Structure and types of cartilage and bone tissue

General bone structure, development and bone types

Bone marrow

Lecture 3

Bone connections, structure and types

Permanent connections: fibrous, cartilaginous, synovial joints

Joint structure: permanent and non-permanent joint components

Types of joints, classification criteria

Range of movement in the joints

Anatomical basis of limitation of joint mobility

Lecture 4

Muscle structure

Morphological basis of the mechanism of muscle contraction. The concept of myon.

Muscle division taking into account the location, shape of the thigh.

Subsidiary muscle structures

Lecture 5

Vascular system

Structure and types of vessels

Differences in the structure of venous and arterial vessels

Lecture 6

Lymphatic system

Vessels of the lymphatic system

Central and peripheral organs of the lymphatic system.

Elements of clinical anatomy of the lymphatic system

Lecture 7

Surface anatomy of the thoracic wall.

Surrounding the chest and back.

The thoracic part of the spine, ribs, sternum

Costovertebral and sternocostal joints.

Superficial and deep muscles of the thorax.

The mammary gland. Road of the lymphatic drainage.

Lecture 8

Body posture

Muscles of the back. Division of the back muscles

Muscles acting on the joints of the vertebral

column. Anatomical conditions of posture defects

Lecture 9

Muscles of the abdominal wall.

Abdominal prelum; anatomical base and clinical

significance. Places of minor resistance. Hernias.

Lecture 10

Tissue and nervous system

Neural structure, body, organelles, dendrites, neurite

Synapse, neurotransmitters, motor plate, neuromuscular spindle

Nerve fibers, structure, types of fibers, nerve sheaths.

Structure of the peripheral nerve

Glia, types, function.

Lecture 11

Mediastinum.

Division, contents and topography of mediastinal organs

Heart development.

Anatomical basis of heart defects

Lecture 12

Heart, structure, location, pericardium

Vessels coming in and out of the heart

cavities. Coronary arteries, coronography.

Innervation and cardiac conduction system.

Functional and clinical anatomy of the heart

Places of auscultating the valves and their projections on the thoracic wall.

Lecture 13

Circulatory system

Aorta and its main branches

Large arteries of the trunk and limbs

Typical heart rate exam sites

Lecture 14

Venous system

The main arterial trunks of the body.

Systems of portal vein and azygos veins.

Superficial veins of limbs.

Clinical aspects of the venous system,

Varicose veins

Lecture 15

Connection of vessels. Credit of lectures.

A. Problems of exercises

Course contents

1. Seminar: Introduction to anatomy. Bone structure. Bones of upper limb. Joints of upper limb – types, structure and function. Joints of shoulder girdle. Joints of free part of upper limb.

Exercise 1: Shoulder (Pectoral) girdle. Scapula and clavicle. Free part of upper limb. Humerus. Forearm bones: ulna and radius. Bones of hand: carpal bones (wrist), metacarpal bones I-V, phalanges of fingers. Joints of shoulder girdle: sternoclavicular joint and acromioclavicular joint (articular surfaces, joint (articular) capsule, ligaments, range of movements). Joints of free part of upper limb. Glenohumeral (shoulder) joint: articular surfaces, articular capsule, glenoid labrum, ligaments, range of movements). Elbow joint: humero-ulnar joint, humero-radial joint, proximal radio-ulnar joint (surfaces, capsule, ligaments, movements). Interosseous membrane of forearm. Distal radio-ulnar joint, radiocarpal joint (surfaces, articular disc, movements). Joints of hand: metacarpal articulations, intermetacarpal joints, metacarpophalangeal joints, interphalangeal joints (surfaces and types of movements). X-ray anatomy of the bones and joints of the upper limb.

2. Seminar: Regions of shoulder and arm. Division of muscle tissue. Muscles of upper limb. Muscles of shoulder girdle Axillary fossa and axillary cavity. Vessels and nerves upper limb. Brachial muscles.

Exercise 2: Muscles of shoulder girdle: supraspinatus muscle, infraspinatus muscle, teres minor muscle, teres major muscle, subscapularis muscle, deltoid muscle- origin and insertion, innervation, function. Muscles of thorax (chest) and muscles of back attached to the upper limb: trapezius muscle, latissimus dorsi muscle, levator scapulae muscle, rhomboideus major and minor muscles, serratus posterior superior and inferior muscles, serratus anterior muscle, pectoralis major and minor muscles, subclavius muscle - effect on movements in the joints of the upper limb. Axilla and axillary cavity: boundaries: axillary inlet, floor, anterior, posterior, medial and lateral wall. Contents of the axilla. Quadrangular and triangular space. Brachial plexus - definition, topography, trunks, cords, branches. Short branches of plexus-range of innervation. Long branches of the brachial plexus. Brachial regions, cutaneous nerves, brachial fascia, medial and lateral intermuscular septum. Muscle compartments of arm. Anterior group of brachial muscles: biceps brachii muscle, coracobrachialis muscle, brachialis muscle (attachments, innervation, function). Musculocutaneous nerve: origin, branches, range of innervation.

3 Seminar: Antebrachial muscles. Muscles of forearm and the hand. Cubital fossa. Vessels and nerves of forearm. Nerves: ulnar, radial and median - topography, range of innervation, symptoms of paralysis.

Exercise 3: Forearm area, skin innervation, superficial veins. Cubital fossa. Vessels and nerves of the forearm. Muscles of the forearm. Anterior compartment of the forearm: superficial, intermediate and deep layers. Muscle identification, origin and insertion, function, innervation. Antebrachial fascia, intermuscular septa. Flexor retinaculum (transverse carpal ligament). Muscles of the posterior compartment of the forearm: superficial and a deep layer. Topographies of the nerves: median, ulnar and radial. Extensor retinaculum. Carpal tunnel: limitations, content. Anatomical "snuffbox". Palmar aponeurosis. Hand regions and skin innervation. Intrinsic muscles of the hand: palmaris brevis, interosseous, adductor pollicis

(thumb adductor), thenar, hypothenar and lumbrical muscles. Vessels of the upper limb: subclavian, brachial, radial and ulnar artery - topography, branches. Innervation and vascularization of the hand. Ulnar artery and superficial palmar arch. Radial artery and deep palmar arch. Veins of the upper limb. Injury of the nerves.

4. Seminar: Bones of lower limb. Joints of the lower limb. Pelvic girdle. Lumbar plexus. Sacral plexus.

Exercises 4: Bones of lower limb: pelvic girdle free part of lower limb. Hip bone: ilium, ischium, pubis. Hip joint. Obturator foramen, obturator canal. Greater and lesser sciatic foramen. Common lacuna: vascular lacuna and muscular lacuna. Pudendal canal. Bones of free part of the lower limb: femur, tibia, fibula, patella. Bones of foot: tarsal bones, metatarsal bones, phalanges of toes. Joints of pelvic girdle: sacro-iliac joint, pubic symphysis. Joints of free part of lower limb: hip joint (surfaces, capsule, ligaments, range of movements), knee joint (surfaces, capsule, ligaments, range of movements). Popliteal fossa-contents. Interosseous membrane of leg. Ankle (talo-crural) joint. Intertarsal joints - surfaces, range of movements. Transverse tarsal (midtarsal) joint. Tarsometatarsal and intermetatarsal joints. Metatarsophalangeal and interphalangeal joints. Arrangement of major structures at the ankle Tarsal tunnel. Retinacula: flexor retinaculum, superior and inferior extensor retinacula. Arches of the foot: longitudinal and transverse. Plantar aponeurosis. X-ray anatomy of bones and joints of the lower limb. Muscles of pelvic girdle - attachment, function, innervation. Iliac fascia.

5. Seminar: Muscles of the thigh. Muscles of the leg. Popliteal fossa. Fascia of leg (crural fascia). Nerves.

Exercise 5: Muscles of the thigh. Anterior compartment of the thigh - sartorius, quadriceps femoris muscle: rectus femoris, vastus lateralis, vastus intermedius, vastus medialis - origin and insertion, function, innervation. Medial compartment of the thigh: gracilis, pectineus, adductor longus, adductor brevis, adductor magnus and obturator externus. Posterior compartment of the thigh: biceps femoris, semitendinosus, semimembranosus - attachment, function, innervation. Fascia lata. Iliotibial tract. Medial and lateral intermuscular septum of the thigh. Lumbar plexus - formation, topography, branches. Sacral plexus - origin, topography, branches; their course and range of innervation. Greater and lesser sciatic foramen. Foramen above and below the piriformis - limits, content. Femoral triangle: boundaries. Adductor canal /of Hunter/- limits, content. Femoral canal, Femoral ring. Saphenous opening, cribriform fascia. Femoral hernia. Obturator canal - limits, content. Cutaneous innervation of gluteal, femoral and leg regions. Anterior compartment of the leg: tibialis anterior, extensor digitorum longus, fibularis (peroneus) tertius, extensor hallucis longus muscles - attachments, function, innervation. Lateral compartment of the leg: fibularis (peroneus) longus, fibularis (peroneus) brevis - attachment, function, innervation. Posterior compartment of the leg: superficial layer - gastrocnemius, soleus, plantaris muscles. Deep posterior compartment of the leg - popliteus, flexor hallucis longus, flexor digitorum longus, tibialis posterior muscles. Popliteal fossa - limitation and content. The popliteal fascia. Fascia of leg (crural fascia). Anterior and posterior intermuscular septum of leg. Superior and inferior extensor retinaculum. Tarsal tunnel and flexor retinaculum- limitations, content. Topography and range innervation of the tibial and common peroneal (fibular) nerves.

6. Seminar: Short foot muscles. Nerves of the foot. Vascularization of the lower limb. Clinical aspects of foot anatomy.

Exercise 6: Short muscles of the foot: the dorsal and plantar muscles of the foot. Dorsal foot muscles: extensor digitorum brevis, extensor hallucis brevis. Plantar foot muscles: medial and lateral eminence muscles, middle plantar muscles. Femoral artery - topography, branches, accompanying veins. Popliteal artery - course, division. Anterior and posterior tibial arteries - the course, branches. Vascular network of the knee joint. The system of superficial and deep veins of the lower limb - practical remarks. Lymphatic system of the lower limb, group of lymph nodes. Anatomy of a living person: viewing and palpation bone points, muscles and tendons on the lower limb, pulse tests of typical places. Muscles performing movements in individual joints of the lower limb. X-ray anatomy, upper and lower limb angiography.

Test 1

Seminar: Vertebral column and skeleton of thoracic cage. Muscles of thoracic wall. Vascularization and innervation of thoracic wall. Mammary gland.

Exercise 7. Orientation lines and regions of thorax. General construction of the spine (division into segments, curvature, spinal canal) Spine function. Structure of the vertebrae. Differences in the structure of the vertebrae in individual segments of vertebral column Joints of vertebral column: syndesmoses, synchondroses, synovial joints. Structure and function of the intervertebral disc. Characteristics of the ribs. Sternum – parts and morphology. Connection of ribs with a sternum and vertebral column. General structure, shape variability and mechanics of thoracic cage. Human anatomy- defining bone points of the thorax (cervical incision and xiphoid process, rib arch, subcostal angle, spinous processes of the vertebrae). Counting ribs. X-ray anatomy of the bones of the spine and chest. Thoracic muscles (origin and insertion, innervation, vascularization, activity). Muscles of thoracic wall: superficial- pectoralis major, pectoralis minor, subclavius, serratus anterior. Intercostal muscles and innermost layer. Topography of the neurovascular cord in the intercostal space. The thoracic fascia. The vascularization of the chest walls. Branches of the subclavian artery (vertebral artery, internal thoracic artery, costocervical trunk, thyrocervical trunk). Thoracic aortic wall/ parietal/ branches (posterior intercostal arteries, superior phrenic arteries, subcostal arteries). Venous outflow from the thoracic walls. Azygos vein, hemiazygos vein, accessory hemiazygos vein. Innervation of thoracic wall. Brachial plexus - supraclavicular part. Intercostal nerves. The mammary gland – structure. Drainage routes of the lymph from the gland. Dorsum - orientation lines and regions. Muscles of the back (attachments, innervation, vascularization): superficial - trapezius, latissimus dorsi, rhomboid major and minor, levator scapulae, serratus posterior superior and inferior. Deep muscle of back (muscle of back proper). Erector spinae. Spine fascia (thoracolumbar fascia). Dorsal branches of thoracic spinal nerves.

7. Seminar: Lungs. Trachea and bronchial tree. Pleural cavities. Mediastinum. Diaphragm.

Exercise 8: Ascending aorta and aortic arch. Veins of thorax – superior vena cava, brachiocephalic veins. Diaphragmatic nerves - topography. Mediastinum – division and contents. The organs, vessels and nerves of the superior, anterior, middle and posterior mediastinum. Pleura - definition, division. Pulmonary ligament, mesentery of the lung, pleural recesses. Pleural vascularization and innervation. Function of pleura. Trachea - definition, topographical relations, tracheal wall construction. Tracheal bifurcation and the difference between the right and left main bronchi. Tracheal vascularization and innervation. Lungs - topographical relations, general structure. Division of intrapulmonary bronchial tree. Terminal and respiratory bronchioles. Broncho-pulmonary segments. Structure of the lung parenchyma – lobes, segments, pulmonary acini. Functional and nutritional vascularization. Pulmonary innervation. Lung lymphatic system. Pulmonary function (ventilation of the lungs, diffusion of gases through alveolar-capillary barrier). Diaphragm - definition, parts of the diaphragm. Diaphragm openings and contents. Diaphragmatic hernia. Mechanics of breathing and types of breathing. Definition and division of mediastinum. Thymus - structure, topographic relations, function.

8. Seminar: Heart. Vessels and innervation of the heart. Pericardium. Fetal circulation. X-ray anatomy of thoracic cage organs.

Exercise 9: Heart - topographic relations in the chest (location, shape, fixation). Morphology heart surface. General terms of the heart: base, apex, surfaces. The heart wall: endocardium, myocardium, epicardium. Coronary groove, anterior and posterior interventricular sulcus. Right and left atrium, right and left ventricles. Heart valves – structure and function. Projection of the heart onto the anterior thoracic wall. Auscultation sites of the heart valves. Coronary circulation - topography of coronary arteries. Outflow of venous blood from the walls of the heart. Conducting system. The influence of the autonomic nervous system on myocardial function and the conductive system. The lymphatic system of the heart. Pericardium - definition, division (pericardial sinuses), vascularization, innervation. Thoracic aorta - topography, branches. Thoracic duct – formation, course. Lymphatic vessels and lymph nodes of the chest. Fetal circulation. - The thoracic part of the sympathetic trunk (topography, branches), topography and branches of vagus nerves in the thoracic region. Interpretation of X-ray images of organs and thoracic vessels.

9. Seminar: Triangles of the cervical region. Muscles of the neck. Vessels and nerves of the neck. Cervical plexus. Thyroid gland. Larynx.

Exercise 10: Regions of the neck. Muscles of the neck (superficial layer - platysma, sternocleidomastoid m., medial layer – suprahyoid and infrahyoid mm, deep layer- scalene mm) - origin, innervation, vascularization, function). Prevertebral mm – division. Fascia of the neck. Neck triangles - limiting the content. Cervical plexus - definition, topography, cutaneous and muscle branches. The dorsal branches of the spinal nerves. Topography of the sublingual nerve. Additional nerve - topography, range of innervation. The cervical segment of the sympathetic trunk - topography and branches. The lymphatic system of the neck. The thyroid gland and parathyroid glands - structure, topography, vascularisation, innervation,

function. Common carotid artery - place of departure, course, division (carotid glomus - innervation, function). Neurovascular fascicle – composition, topography. Internal carotid artery - the course on the neck. Vagus nerve - cervical segment (topography and branches). External carotid artery – topography, relations, branches. Superior thyroid artery, lingual artery, occipital artery, auricular posterior artery, ascending pharyngeal artery. External jugular vein - formation, topography, tributaries. Larynx - the skeleton of the larynx: cartilages). Membranous and ligamentous connections of the laryngeal cartilage. Mechanics of the larynx joints. Membrane and ligamentous connections inside the larynx (elastic cone, quadrangular membrane, vocal ligament). Functional division of the larynx muscles. Division of larynx cavities. Laryngeal cavities: laryngeal inlet, laryngeal vestibule, intermediate cavity of larynx, laryngeal ventricle, glottis, infraglottic cavity. Vascularization and innervation of the larynx. Larynx function.

Test 2

5. Seminar: Surface anatomy of abdomen. Male and female pelvis. Bones, joints –division.

Exercise 11: Abdominal regions. Lines and planes dividing of the abdomen. Anterolateral abdominal wall (fascia, muscles, nerves, vessels). Superficial fascia of abdomen: Camper and Scarpa fascia. Deep fascia. Muscles of abdomen. Pelvis as a whole. Detailed structure of the pelvic and sacrum. Sacroiliac and sacrococcygeal joints – function. Pubic symphysis. Pelvic ligaments. Dimensions of the pelvis, - planes. Abdominal wall - layers. Abdominal muscles - attachemnts, innervation, vascularization, activity. Structure of the rectus abdominis muscle sheath above and below the arcuate line and its contents. The internal surface of the anterior abdominal wall – arcuate line, median, medial and lateral umbilical folds. Supravesical fossa, medial inguinal fossa, lateral inguinal fossa. The inguinal canal -inguinal rings (superficial and deep), walls, course and contents of the inguinal canal. Places of reduced resistance of the abdominal wall. Concept of a hernia. Abdominal hernia - congenital and acquired, internal, detailed knowledge of anatomical relations in straight and oblique inguinal hernia. Surface human anatomy - bone pelvic points, Lanza point, Mc Burney and correlation of the position of individual organs with the sounds percussion of the abdominal surface.

6. Seminar: Peritoneum. Esophagus. Stomach. Small intestine. Large intestine. Rectum.

Exercise 12: Peritoneum - layered structure: parietal and visceral peritoneum, peritoneal functions. Peritoneal cavity, peritoneal recesses. Intraperitoneal and extraperitoneal position of organs. Omental bursa - location and restrictions: omental /epiploic/ foramen, omental recesses, organs adhering to them. Greater omentum: gastrophrenic, gastrocolic, gastrosplenic ligaments. Structure of mesentery and ligaments in the abdominal cavity. Position of organs in relation to peritoneum. Determine the location of specific organs on the living person. Gastrointestinal tract - parts, general structure of gastrointestinal walls - layers, innervation. The abdominal part of the esophagus. Topography of vagus nerves in relation to the esophagus. Esophageal vascularization. Stomach - external and layered structure. Gastric mucosa - mucous glands, separation of structure in different parts of the stomach, gastric digestive enzymes. Structure and activity of the pylorus. Duodenum - external and layered structure. Duodenal mucosa - duodenal glands, duodenal digestive enzymes. Major and minor duodenal papilla. Jejunum and ileum - location of the course, division into parts. Structure of the intestinal mucosa in the proximal and distal segments. Small intestine functions. Arterial vascularization of the stomach, duodenum, jejunum and ileum. Meckel diverticulum - location, practical importance. Colon (ascending, transverse, descending, sigmoidal, rectum) - location, function, vascularization, attitude to the peritoneum. Appendix - construction, location variants. Differences in external structure,

mucosa and vascularity of the small and large intestine. retroperitoneal space. X-ray images of the gastrointestinal tract.

Seminar: Liver. Bile ducts. Spleen. Pancreas. Great vessels of abdominal cavity. Innervations of abdominal cavity organs.

Exercise 13: Liver – surfaces, location, external structure, division into lobes. Liver hilum - structures. liver function. Bile - origin, physiological significance. The concept of the liver segment, liver division. Diaphragmatic surface: impressions, bare area. Fibrous capsule. Structures on the visceral surface: groove for vena cava, fissure for venous ligament, fossa for gallbladder, fissure for ligament teres / round ligament/. Extra- and intrahepatic bile ducts and their topography. Gallbladder – parts, external structure, location, function. Common bile duct; sphincter of bile duct, hepatopancreatic ampulla /of Vater/, sphincter of ampulla /of Oddi/. Pancreas - location, division into parts, fine structure. Enzymatic and hormonal function of the pancreas. Pancreatic ducts and their topography. Pancreatic vascularization. Spleen - location, internal and external structure, ligaments. Spleen function. Vascularization. Abdominal aorta - crossing the diaphragm, location, aortic branches and their topography. Arterial abdominal circulation in the abdominal cavity, physiology of visceral circulation. Inferior vena cava - the layered structure of the walls, the tributaries, the areas from which it collects the blood. Formation and topography of the portal vein. Portal circulation in the abdominal cavity and its physiological significance. Portal hypertension. Collateral circulation; esophagus, renal, rectal and retroperitoneal circulation. Anatomical connection superior and inferior vena cava. Fetal circulation. Remnants of fetal circulation in the abdominal cavity. The autonomic nervous system – the physiology of the sympathetic and parasympathetic parts in relation to the organs of the digestive tract. Lumbar, ventral and pelvic segment of the sympathetic trunk. Visceral plexus - structure, location, branches, secondary plexuses. Plexuses in the gastrointestinal wall. Visceral and somatic pain in the aspect of innervation of the abdominal organs. Head fields.

7. Seminar: Kidneys. Ureter. Urinary bladder. Pelvis minor – topographic relation, vessels and nerves. Lumbosacral plexus.

Exercise 14: Kidney - location, external structure, fixation of the kidneys. Renal fascia, perirenal fat capsule, capsule of kidney. Surface of the kidney; borders, renal hilum. Structure in the frontal section: lobes, segments- superior, anterior superior, anterior inferior, inferior, posterior. Renal cortex - columns. Renal medulla – pyramids. Nephron – structure and function. Renal vascularization: renal arteries, interlobar arteries, arcuate arteries, interlobular arteries, afferent and efferent glomerular arteriole, straight arterioles. Urine outflow route: major and minor calices, renal pelvis. Ureter – abdominal, pelvic, intramural parts of ureter. Urinary bladder - external structure, relation to the peritoneum. Parts of the bladder: apex, body, fundus, of urinary bladder. The structure of the bladder mucosa - trigone of urinary bladder. Vascularization and innervation of the bladder. Urethra - the course, the difference in the structure of the male and female urethra. Adrenal glands - location, external structure, function. Hormones corresponding to individual layers of adrenal gland.

Perineum

– urogenital triangle, anal triangle. Pelvic diaphragm, urogenital diaphragm - parts, structure, importance. Rectum – pelvic and anal parts, flexures. Detailed mucosal structure, arterial and venous vascularization: rectal venous plexus. Anus. Internal iliac artery - visceral and parietal branches. Lumbar plexus, sacral plexus - formation of position, short and long branches. The pudendal nerve - topography and range of innervation. Pudendal canal. Ischiorectal fossa.

Test 3

8. Seminar: Internal and external male genitalia. Internal and external female genitalia. Testis – structure, tunicae testis. Descending testes.

Exercise 15: The epididymis - structure, function. Ductus deferens - the course. Spermatic cord - elements included in the spermatic cord, the course of the spermatic cord. Prostate gland - location, structure, detailed topographic relations. Seminal vesicles and bulbo-urethral glands. Anatomical relations during rectal examination. Scrotum. The penis - external and internal structure, vascularization and innervation. Erection and ejaculation mechanism. Urethra - the course, division into: prostatic, membranous, spongy parts. Genetic, gonadal, somatic, socio-psychological gender. Sexual dimorphism of body. Skeleton. Innervation of the external genitalia. Ovary – location, ligaments, structure vascularization. Hormonal activity of the ovary. Ectopic pregnancy. Uterine (Fallopian) tube (oviduct)- division into parts, walls, activity, vascularization. Uterus: body, fundus, cavity, isthmus, cervix, cervical canal. Endometrium, myometrium, perimetrium, parametrium. Position of the uterus. Uterine ligaments. Cyclic changes in the endometrium. Female pudendum, vestibule of the vagina and lesser and greater vestibular (Bartholin's) gland, urethral meatus, clitoris, labia majora and minora, hymen. Vagina; vaginal rugae. Female urethra. Anatomy of insemination and fertilization. Childbirth - birth canal topographical relations during examination "per rectum" and two-handed in women.

A. Seminars

Course contents

Introduction to anatomy. Bone structure. Bone connections. Bone connections - types of connections, construction, functions. Bones of the upper limb. Connections of the upper limb

Division of muscle tissue. Muscles of the upper limb. Deltoid and axillary cavity. Arm muscles. Surrounding the shoulder and arm.

Forearm and hand muscles. Bottom of the elbow. Dishes and nerves of the forearm. Muscles of the hand. Nerves: ulnar, radial, median - topography, range of innervation, symptoms of paralysis.

Bones of the lower limb Connections of the lower limb. Muscles of the lower limb. Lumbar plexus. Cross plexus.

Thigh muscles. Shin muscles. Popliteal fossa. Fascia tibia.

Nerves.

Short foot muscles. Nerves of the foot. Vascularization of the lower limbs. Clinical aspects of foot anatomy.

Test 1

Spinal column and chest bones. Muscles, chest fascia and back. The vascularization and innervating of the chest wall. The mammary gland.

Trachea and bronchi. Lungs. Pleura. Mediastinum. Diaphragm.

Heart. Dishes and innervation of the heart. Pericardium. Rear mediastinal organs. Fetal circulation. Chest x-ray anatomy.

Muscles and neck triangles. Cervical plexus. Thyroid gland. Dishes and nerves of the neck. Larynx.

Test 2

Abdomen as a whole. Pelvis. The walls of the abdominal cavity.

Peritoneum. Stomach, duodenum, jejunum and winding. Intestine

Thick.

Liver, bile ducts, spleen, pancreas. Big abdominal cavities. Intra-abdominal cavities.

Kidneys, ureters, bladder, adrenal glands. Small pelvis - topographical relations, vessels and nerves. Lumbar-sacral plexus.

Male and female sexual organs. Female internal and external sex organs. Nucleus - structure, location, nuclear casings and their origin. Descent of testicles. Hormonal activity.

Test 3

3.3 TEACHING METHODS

Communicative methods:

- Organizational forms of individual work, group work, discussion, problem solving and multimedia presentation of chosen field, case analysis, written translations in English
- Lectures with multimedia presentation, providing students with in-depth scientific knowledge in the field of anatomy, solving research problems
- Seminars / seminars: discussion, preparation of a research problem and research methodology based on scientific publications, searching and collecting literature data on the basis of scientific publications, work with databases, development of experimental results, statistical analysis, formulation and analysis of applications, participation in writing a scientific publication and preparing a congress message
- Observation-based methods: demonstration, multimedia presentation
- Methods based on the practical activity of students: practical classes in the dissecting room
- Methods of intra-articular imaging of anatomical structures: X-ray, CT, NMR -- teaching aids: a virtual anatomical table, anatomical models, boards, didactic films

4 METHODS AND EVALUATION CRITERIA

4.1 Methods of verification of learning outcomes

Symbol of effect	Methods of assessment of learning outcomes (Eg.: tests, oral exams, written exams, project reports, observations during classes)	Form of classes
EK_01	Observation during classes	prosectorial exercises
EK_02	Colloquium, exam	exercises, lectures
EK_03	COLLOQUIUM, PRACTICAL EXAM, TEST EXAM	exercises, lectures,
EK_04	Observation during classes, colloquium, test exam	exercises, lectures, seminars
EK_05	Colloquium, exam	exercises, lectures,
EK_06	Observation during the course of the prosector classes, colloquium, exam	exercises, lectures,
EK_07	Colloquium, practical exam	exercises

EK_08	Observation during the course of the prosector classes, practical exam, test exam	exercises, lectures, seminars
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4.2 Conditions for completing the course (evaluation criteria)

The condition of passing the course is to achieve all the results of the training, in particular, to lectures - written test (MCQ test), verified learning outcomes: EK_02, EK_03, EK_04, EK_06,

Exercises - credit with an assessment including:

- attendance
- activity on exercises
- grades from partial tests
- observation of the student's work and attitudes.

Verified learning outcomes EK_01- EK_08, Seminars - credit including:

- attendance
- student activity

Verified learning outcomes EK_01, EK_03, EK_04, EK_05, EK_08,

Exercises and seminars

- 1.systematic, full participation in the exercises
- 2.colloquia during the year with the assessment from the next sections of the anatomy in a topographical view.
- 3.test with single-choice and / or open problem questions

Knowledge assessment, verified learning outcomes:

Written test:

5.0 - has knowledge of each of the contents of education at the level of 90% -100%

4.5 - has knowledge of each of the content of education at the level of 84% -89%

4.0 - has knowledge of each of the content of education at the level of 77% -83%

3.5 - has knowledge of each of the content of education at the level of 70% -76%

3.0 - has knowledge of each of the content of education at the level of 60% -69%

2.0 - has knowledge of each of the contents of education below

60% Assessment of skills, verified learning outcomes:

5.0 - the student actively participates in classes, recognizes and is able to correctly name individual anatomical units on phantoms and in the human body; can relate knowledge of the detailed human anatomy, especially in the area of the musculoskeletal system and the nervous system with the function and tasks of individual organs.

4.5 - the student actively participates in the classes, with little help from the teacher he recognizes and is able to properly name individual anatomical units on phantoms and in the human body; can relate knowledge of the detailed human anatomy, especially in the area of the musculoskeletal system and the nervous system with the function and tasks of individual organs.

4.0 - the student actively participates in classes, with minor corrections of the teacher, commits minor mistakes, recognizes and is able to properly name individual anatomical units on phantoms and in the human body; can relate knowledge of the detailed human anatomy, especially in the area of the musculoskeletal system and the nervous system with the function and tasks of individual organs.

3.5 - the student participates in activities with corrections and teacher's instructions recognizes and is able to properly name individual anatomical units on phantoms and in the human body; can relate knowledge of the detailed human anatomy, especially in the area of the musculoskeletal system and the nervous system with the function and tasks of individual organs.

3.0 - the student participates in classes, with numerous corrections and instructions from the teacher, but commits minor mistakes and recognizes and correctly names individual anatomical units on phantoms and in the human body; can relate knowledge of the detailed human anatomy, especially in the area of the musculoskeletal system and the nervous system with the function and tasks of individual organs.

2.0 - the student passively participates in classes, commits blatant errors in the diagnosis and proper naming of anatomical units, and cannot link knowledge of the detailed human anatomical structure with the function and tasks of individual organs.

Knowledge evaluation, verified learning outcomes: EK_01-EK_05

Assessment of skills, verified learning outcomes: EK_06-EK_08

5. Total student workload required to achieve the desired result in hours and ECTS credits

Activity	Hours / student work
Hours of classes according to plan with the teacher	100
Preparation for classes	85
Participation in the consultations	2
The time to write a paper / essay	
Preparation for tests	90
Participation in colloquia	
Other (e-learning)	
SUM OF HOURS	227
TOTAL NUMBER OF ECTS	11

6. TRAINING PRACTICES IN THE SUBJECT / MODUL

Number of hours	
Rules and forms of apprenticeship	

LITERATURE

<p>Obligatory sources:</p> <ol style="list-style-type: none"> 1. Gray's Anatomy for Students. R.L. Drake, A.W. Vogl, W.M. Mitchell 2. Basic Clinical Neuroscience. P. A. Young, P.H. Young, D. Tolbert 3. Atlas of Human Anatomy. Frank H. Netter
<p>Additional literature:</p> <ol style="list-style-type: none"> 1. Memorix Anatomy – R. Hudak, D.Kachlik, O.Wolny <p>Additional sources for self-studying:</p> <ol style="list-style-type: none"> 1. Clinically Oriented Anatomy. K. I. Moore, A.F. Dalley

Acceptance Unit Manager or authorized person