

SYLLABUS

concerning the cycle of education 2018-2024

(date range)

1.1. BASIC INFORMATION CONCERNING THIS SUBJECT / MODULE

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, 2nd 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
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	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	He 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	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 appointment	A.U5

3.3 CONTENT CURRICULUM (filled by the coordinator)

A. Lectures

Problems of the lecture

Course contents**Lecture 1**

Peripheral nervous system

Reflex arc - the concept and elements of the reflex arc

Neural strands - formation, branches, range of innervation

Cervical plexus, brachial, lumbar and sacral plexus

Lecture 2

Central nervous system

Divisions including embryological, topographical and clinical criteria

Tissues of the brain and spinal cord

Sinus venous dura

Vascularization and innervation of tissues

Spaces: epidural, subdural, subarachnoid - their clinical significance

Turnover and circulation of cerebrospinal fluid

Lecture 3

cerebrum

Division of the telencephalon; lobes, bends, furrows

Topography of cerebral cortical centers

Splicing, commissure and associative fibers - characteristics of their course

Nucleus of the brain base - structure, function, connections

Damage to the basal ganglia - clinical aspects

Marginal system (limbic)

Lecture 4

diencephalon

Division of the diencephalon

Hill - nuclei of the hills, connections and their functional meaning

Hypothalamus - division and function

Lecture 5

midbrain

External structure of the midbrain: tectum / tegmentum and cerebral peduncles /, cover plate

Internal structure: location of cranial nuclei

Extrapyramidal system centers

Nucleus of the reticular formation

Topography of nerve pathways

"Reward system"

Lecture 6

hindbrain

Secondary cerebral cortex / pons and cerebellum /, core brain

Internal structure of the pons: location of cranial nuclei

Subcortical centers of the extrapyramidal system

The course of nervous pathways in the pons. Cerebellum, phylogenetic division

Extended core, external and internal structure, location of cranial nodal nuclei

Lecture 7

Autonomic nervous system

Division of the autonomic system
Centers of the sympathetic and parasympathetic system
Coils and tangles of the autonomic system
Clinical aspects

Lecture 8

Respiratory system.
Upper and lower respiratory tract. Larynx and trachea
Construction of the lungs and pleura.
Mechanics of breathing, inspiratory and exhalation muscles.
Auxiliary respiratory muscles.

Lecture 9

Digestive system.
The division of the digestive tract.
General construction; wall layers of the digestive tract.
Abdominal organs: stomach, duodenum, small and large intestine.
Otrzewna, retroperitoneal space and its contents.

Lecture 10

Large glands of the digestive tract.
Construction of the liver and bile ducts.
Functional and nutritional vascularization.
Pancreas, topography and structure, clinical implications.
Parotid, submandibular and sublingual glands.

Lecture 11

Urinary tract
Topography, structure and vascularization of the kidneys. Nephron.
Urinary pathways: ureter, bladder, urethra.

Lecture 12

Male sexual organs
The structure and operation of the nucleus.
The epididymis, the vas deferens, the seminal vesicles
Spermatogenesis and spermiogenesis.
Descent of testicles.
External sexual organs

Lecture 13

Female sexual organs.
Ovary - location, construction and operation.
Uterus. Fallopian tube and vagina.
Menstrual cycle, fertilization, pregnancy.
External sexual organs

Lecture 14

Endocrine glands
Structure and function of the glands.
The hypothalamic - pituitary axis - gonads.
Feedback, neurosecretion.

Location, general structure of the pituitary, pineal gland, thyroid gland
Parathyroid, adrenal glands, parts of the endocrine pancreas.

Lecture 15

Common body coating. The structure and activity of the skin.

Leather allowances. receptors

B. Problems of exercises

Course contents

Exercise 1: Basic knowledge about skull bone structure: composition, shape, internal structure, development. Identification of constituent bones: even and even bones, division into splanchno - and neurocranium. Individual development of the human skull - bones formed on the connective and cradlear surface. Baby and infant skull, menses. Deadlines: vault, forehead, ophthalmia, temple, occiput. Connections of the skull bones: tight (trabozrosty, cartilage, bonerosis) and joint. Wedging as a special type of connection. Sutures: coronary, sagittal, carbon-like, parietal-parietal, scaling, wedge-scaling, parietal-mammary, occipital-mammary, front-zygomatic, wedge-clavicular, palatal, transaural, fronto-nasal, maxillary-maxillary, zygomatic-maxillary . Approximate time of seam overgrowth. Articular joints - examples, temporomandibular joint, (lifting, lowering, easing, reversing, movements, lateral and mechanics of movements. Differences in the structure of the skull related to age and sex, skull base and main openings based on the skull. - and skulls under the influence of injuries - anatomical basis of skull base fractures

Exercise 2: Base of the skull - the front, middle and posterior (bone forming these holes, the boundaries of the pits), the contents - all holes on the base leading the larger vessels and the nn. cranial or their branches. Skull bones: occipital (basal part, scales, lateral parts - and structures associated with these parts, including the throat nodules, elements on the external and internal surface of the scales: external and internal occipital protuberances, cervical margins, external and internal occipital crests) , sinus furrows: sagittal sagittal, transverse, occipital protuberance, sublingual nerve channel, conduit canal, cervical incision), parietal (margins, elements visible on the external and internal surface: parietal tumor, temporal border, sulcus of the superior sinuum), temporal (part scaly, mammary, tympanic, rocky = pyramid and elements related to these parts, eg zygomatic process, mandibular apex, nipple, base, top and three pyramid surfaces, internal auditory hole, cervical incision, carotid artery canal, styloid process , nipple and nipple, facial nerve canal, conduit external hatch), wedge (shank, large and smaller wings, winged processes and elements related to these parts: Turkish saddle, sphenoid sinus, sloping processes, carotid furrow, round hole, oval, spine, visual canal, wing bottom), frontal (scales, orbital parts, nasal part and related elements: frontal tumors, glaucoma, supraorbital margins, apertures and supraorbital incisions, frontal incision, frontal opening, zygomatic process, sulcus of the superior sinualis, cerebral cortex, fingerprints, nasal spike) , zygomatic (shank, appendix, temporal), maxillary (shank, appendix, zygomatic, frontal, alveolar, palatal and related components: maxillary and maxillary sinus, orifice and orbital margin, nasal incision and anterior nasal spike, bottom notch , open channel, openings), sieve (sieve plate, vertical plate, labyrinth

and elements with them) associated: rooster comb, lateral lobe = orbita, medial lobe, upper, middle nasal turbinates), palatine (horizontal lamina, vertical plaque, appendages: pyramidal, orbital, cuneiform and related components: palatine major opening, smaller). Bony restraints of the eye socket and nasal cavity. Other skull pits, their location, contents and connection

Exercise 3: Nasal cavity - vault, side walls, bottom, frontal nostrils - \ "gates \ " to the nasal cavity, posterior nostril. Nasal cartilage - septum, lateral, greater wing, smaller, navicular, przymieszowa. The nasal noses. The olfactory field and its location. Bones forming the hard palate, the muscles of the palate and their innervation. The olfactory route. The paranasal sinuses - wedge, frontal, maxilla and sieve cells - the size of the sinuses, the meaning, the innervation. Places of the mouth of the paranasal sinuses and tears to the nasal cavity. Language. Salivary glands. In order to. Throat. The warts of the tongue, their role and location - surrounded, threadlike, conical, mushroom-like, deciduous. Muscles of internal and external language. Vascularization and innervation of the tongue. The way of taste: receptors - taste buds. First neuron - coil cells in a reel: elbow (VII), lower coil (IX and X), hence through a lone band. The second neuron - the nucleus of the lonely band, from there to the opposite hill. Third Neuron - the arcuate nucleus additional hills - to the bark of the island and the lower part of the median bend. Salivary glands: parotid, submandibular, sublingual - composition of saliva and meaning, functional division of the salivary glands, mucus, mixed glands, location, place of mouth in the mouth. Secant teeth, canines, premolars and molars. Pattern of dairy and permanent dentition. Throat - division into parts: nasal, oral and laryngeal. Diagram of the construction of the throat wall. Spit and levers of the throat and their innervation. A sensory innervation of the throat. Angiosperms and its clinical significance. Vascularization of the head: arteries and veins of the head and neck.

Exercise 4: Tires of the brain and spinal cord. The hard tire and its creations: the sickle of the brain and the cerebellum, the tent of the cerebellum, the supra and supratentorial space, the indentation of the tent, the cerebellar sickle, the diaphragm of the saddle. Clinical significance of the above structures. Venous sinus duralis, arachnoid granulation. Tincture and innervation of the dura mater. Tire vascularization. Over- and "sub-dural space". Spider tire, its bars and their mechanical role. Cerebrospinal fluid reservoirs. Perivascular spaces (Virchowa-Robina). Spinal cord tires. Cerebrum. Patches, bends and furrows. The boundaries of the patches, the ability to indicate the corners of a given piece. Microscopic construction of gray and white matter. Functional centers in the cerebral cortex: limbic system, hippocampus formation and functions assigned to them.

Exercise 5. Amygdala, bulwark, basal ganglia: caudate nucleus, lentic nucleus. striatum; caudate nucleus + lenticular nucleus crust with a similar embryonic origin and function (neostriatum). Pale knob (globus pallidum)
Internal structure of hemispheres - white substance. Mating, commissable and projective roads - precise definitions, examples of individual roads. Inner, outer, last bag. Brain scrotals: large, front, posterior, vaults, glands.

Long and short mating paths - examples.

Cerebrospinal fluid - composition and function. The formation of cerebrospinal fluid in the choroid plexus of all chambers. Absorption of cerebrospinal fluid. Grains of arachnoid. Side chambers and chamber

third - production and circulation of cerebrospinal fluid. Corners of side chambers. Chamber walls and connecting holes. Intracranial division: thalamencephalon (epithalamus, thalamus, metathalamus) subthalamus, hypothalamus. Szyszynka and its product - melatonin. Sweethearts, nucleus of the headgear. Hill - specific nuclei (with a relatively well-known function): lateral knee (visual pathway), medial condyle body (auditory pathway), VPL (ventral posterolateral) - from medial to somatosensory bark, VPM (ventral posteromedial) - from tractus trigeminothalamicus for the somatosensory cortex, VL / VA (ventral lateral and ventral anterior) from the cerebellum and ganglia of the base to the motor cortex, AV (anteroventral) - from the mammary bodies to the cingulate cusp. Division of the hypothalamus into parts: ophthalmic, nodular, and mastic. Nuclear hypersensitive (neurosecretory), paraventricular (neurosecular), super-cruciate, anterior nucleus. In the medial-nodule part: dorsomedialis, ventromedialis and at the bottom of the funnel cone - infundibularis (arcuatus). Complex of testicular nuclei and hypothalamic posterior nucleus. The action of the hypothalamus. Pituitary, division into parts: posterior, i.e. neuropathies, which is the funnel and the posterior and frontal lobes, i.e. the pituitary gland. Influence of the hypothalamus on the pituitary gland. Neurosekrecja. Hypothalamic-pituitary portal circulation. Hormones of the anterior pituitary gland. Third chamber, its position, holes connecting with lateral chambers, delays

Test 1

Exercise 6: Elements of the external brain stem structure - all. Structure of the brainstem on cross-sections through upper and lower hillocks, bridge, bolt, crossroads of pyramids.

Elements: slender and wedge bunch and their nuclei, pyramid intersection, internal arcuate fibers, medial band (more along the auditory path), oligoneum, lower, middle and upper cerebellar boughs (see next exercise), red core, black essence, cap, cover, water supply.

Exit places and nuclei nn. cranial in the brainstem. The fourth chamber, the bottom of the fourth chamber. The ceiling of the fourth chamber: the cerebellum, the branches of the cerebellum, and the curtains of the choroid and the choroid plexus. Bottom of the fourth chamber: parallelogram bottom. Division and structural elements distinguishable at the bottom of the parallelogram in the upper and lower triangle. Location of nuclei nn. cranial in the brainstem.

Exercise 7: Hemispheres, upper and lower surface. Morphological division into lobes: frontal lobes, first fissure, mid-posterior lobes (the cerebellar hemisphere, pyramid and suppository suppository), posterior lateral aperture, papulo-floc lobe (papules + lumps). Tonsils of the cerebellum. Morphological and clinical division into longitudinal zones: worm, intermediate zone (post-periphery), lateral zone. The cerebellar cortex, the indigenous body. Nucleus: top, spigot + globular, toothed. Branches of the cerebellum: the lower (the centripetal fibers from the spinal cord and the brainstem), the middle (the centripetal fibers from the bridge's nuclei), the upper (centrifugal fibers, mainly from the nucleus to the bark, the displacement path from

the cerebellum). The structure of the cerebellar cortex - ext. molecular layer, Purkinje cell layer, granular layer. Functional aspects of the cerebellum morphological structures. Reticular formation, functions: motor, sensory, visceral, associated with consciousness, sense of existence, vigilance.

Exercise 8: External and internal structure. The concept of rope (funiculus), horn (corn) and column (columna). Interneurons: mating, commissural and projective. The substantia gelatinosa, nucleus proprius, fasciculus dorsolateralis (Lissauer tract), nucleus dorsalis. Movement cells of the anterior horns. Sympathetic intermediate nucleus (nucleus intermedio-lateralis), the parasympathetic nucleus intermedio-medialis. White, gray front and back dense. White matter: long ascending fibers, long descending fibers, short (propriospinalis) connecting different segments of the core. Clinical syndromes: spinal shock, Brown-Sequard syndrome, syringomyelia. Cortico-spinal and cortico-motor (motor) roads. Descending roads: vestibulospinalis - posture correction, corticospinalis, reticulospinalis, rubrospinalis, tectospinalis. The corticospinal (pyramidal) pathway, the motor pathway of the spinal nerves. Precentral gyrus - cell body and neuron. The cellular body II- the spinal cord's frontal horns. Spastic paralysis (paralysis spastica), i.e. inability to perform movements along with pathological muscle tone. Paracysis flaccida, e.g. after traumatic nerve injury, in the disease of Heine and Medina etc. The corticobulbaris pathway. Central and peripheral neuron infection. Stroke.

Exercise 9: Roots, trunk, branches. The front root: the front and side of the anterior motor mobile motions. Back root, ganglion spinale. Stem n. Spinal: branches (ventral, dorsal, meningomous, connecting white-confluence and connecting gray-zwójjowa.) Essence gray core in cross-section - front, rear, lateral, intermediate gray essence White essence in cross-section - front cord, lateral and posterior spinal cord, spinal cord infiltration and their relation to spinal cord elements Surface pathway (warmth, cold, pain) - anterior-lateral apical-lateral pathway The path of conscious deep feeling and pressure, discriminating touch and vibration. Strands, scrolls, nerves. Centers of the autonomic nervous system in the spinal cord (indirect and lateral nucleus and intermediate medial nucleus).

Exercise 10: Internal carotid puncture: cervical part - from the beginning to the rocky part of the temporal bone. Then, through the cervical opening, where it is surrounded by a venous plexus that protects the free ripple and further detailed course. Branches: cavernous sinus, ocular (under the nerve in the visual channel): middle volleyball, tear, end branches: t plexus torso, dorsal rhinoplasty, back connective tissue: (connects to the back of the brain), choroidal choroid: to the choroid plexus of the lateral ventricle, frontal brain: frontal connecting, middle brain: (hh. middle, oval cortical). Generally range: brains, orbits with contents, eyelids, durabura of the anterior cranial fossa, mucus membrane, sinuses and nasal cavity. Spinal cord: branches: posterior spinal column - can run, locally reinforcing up to the end of the core, t. Spinal front, posterior lower back of the cerebellum, basal: lower anterior cerebellum, labyrinth, branches to the bridge, upper cerebellum, final forks: back of the brain (hg choroidal, central hg, cortical). Arterial cerebral circle. Outflow of venous blood from the brain. Superficial and deep veins of the brain. Sinus venous dura. Aspects of anatomical-

practical: haemorrhagic and ischemic strokes, aneurysms, arteriovenous malformations, epidural hematoma, subdural, subarachnoid haemorrhage. Strokes in the vicinity of the inner bag. Spinal cord dissection.

Test 2

Exercise 11: Superior centers of the autonomic system (limbic system, amygdala, hypothalamus, locus coeruleus, reticular formation and others). Functional division of the autonomic system. The sympathetic part. Sympathetic trunk, sympathetic nerves: gg. along the arteries, nn. cardiac, nn. visceral. Strands: cardiac, intraosseous, upper and lower abdomen. Upper cervical ganglion. Branches of the heart. A starburst scroll. Visceral nerve greater. Visceral nerve smaller. The parasympathetic part of the autonomic nervous system. Ciliocortex (g. Ciliare), wing-palatal ganglion (g. Pterygo-palatinum). Subgital coil (g. Submandibulare) of the fiber from the salivary gland upper n. VII through the tympanic phalanx. The ear coil (g. Oticum), the fibers from the dorsal nucleus n. IX (also called salivary lower) - through the tympanic nerve and its extension - rocky smaller, fibers to the parotid gland and cheekbones. Nerve X - the dorsal nerve nucleus X range of supply. The cruciate region - the intermediate nucleus (nucleus intermedio-medialis), at the level of neuromers S2-S4. Pelvic visceral nerves (nervi splanchnici pelvini = nervi erigentes). Intestinal part of the autonomic system. - plexus convolutional neural network along the entire length of the gastrointestinal tract, including the vesicle and the pancreas. Intramuscular plexus (plexus myentericus seu Auerbachii), submucosal plexus (plexus submucosus seu Meissneri).

Exercise 12: Facial nerve VII (facialis): two parts - greater movement, less so-called nervus intermedius - parasympathetic-sensory. The larger part: stapedius, stylohyoideus, posterior digastric gaster, facial expressions and buccinator, platysma and occipitalis. Nerves - branches of the facial: up to mm. expressions: n. temporalis - frontal m., n. zygomaticus - oculi orbicularis, n. buccalis - buccinator et orbicularis oris, n. mandibularis - orbicularis oris, n. cervicalis - platysma, n. auricularis posterior - m. occipitalis. The smaller part: parasympathetic: lacrimal gland, submandibular and sub-sublethal salivary glands, mucus membrane glands. nose, sinuses, hard and soft palate. Parasympathetic fibers in the upper (tear) salivary nucleus. Parasomal fibers, large rocky nerve (lacrimal gland and nasal glands) and eardrum (submandibular and sublingual gland) Nerve V. Special feeling: taste of two-thirds of the tongue, hard and soft palate, cell bodies in the ganglion of the elbow. in the tympanic cavity, the rostral part of the nucleus of the lonely band (the taste nucleus). Clinical aspects related to the course of the nerves V and VII. Geptear nerve (glossopharyngeus), innervation range: one transversely striated muscle - stylopharyngeus (sore throat when speaking and swallowing), parasympathetic fibers through the ear, the parotid gland and the posterior part of the tongue, feeling (unconscious) from the carotid sinus and a cervical ball - through the branch of the carotid artery sinus, the sensation of taste from the back 1/3 of the tongue through the lower coil, the general sensation from the back 1/3 of the tongue, the ear's skin, internal area. tympanic membrane, tonsils of the palate, throat through the upper or lower nerve of the nerve IX. The course of the nerve IX. Plexus tympanicus: from the northern part of the gallery, connecting the n. VII and L. cervico-tympanum from cervical-internal plexus plexus. Erroneous nerve (vagus) X extent

of innervation: skeletal muscles of the throat, soft palate (without tensor veli palatini - V3), larynx – with except stylopharyngeus (IX) and one tongue muscle (palatoglossus). Throat plexus formation arises from gg. IX, X and sympathetic fibers, parasympathetic smooth muscles and glands of thoracic and abdomen (including thyroid, parathyroid glands), conduct visceral sensation from the chest and abdomen, from receptors in the aortic arch wall, from aortic bodies near the aortic arch, feeling General from the posterior base of the skull, the skin of the external auditory canal (posterior and lower wall), a piece of tympanic membrane, throat, larynx. The course of the vagus nerve, upper laryngeal nerve, Laryngeal recurrent laryngeal nerve, laryngeal laryngeal nerve (motor for all larynx muscles with the exception of the annular thyroid). Tricuspid V (trigeminus), thrombotic ganglion (trigeminale ganglia). Ramus seu nervus ophthalmicus - V1 - comes out - upper orbital fissure, Ramus seu nervus maxillaris - V2 - comes out - round hole (foramen rotundum). Ramus V3 seu nervus mandibularis comes out - oval hole (foramen ovale). The scope of innervation: motor: chewing muscles, m. Tensor tympani, m. Tensor veli palatini, mylohyoideus, venter anterior m. Digastrica, sensory: conjunctiva, eyeball, sinus mucosa, nasal and oral cavity, a little extrinsic the surface of the eardrum, the ankle of the anterior and middle skulls. The main division of the branches: Ophthalmic nerve - V1: lacrimal, frontal: (peripheral, supraorbital, nerve to the frontal sinus), nasopharyngeal: (long and short cilium, subpanular, front and posterior screen), Tire to the tent of the cerebellum. Jaw nerve - V2: zygomatic: (zygomatico-temporal, zygomatico-facial), suborbital: (nasal external, labial upper, alveolar upper hindquarters, central and frontal), wing-palatal: (orbital, palatal larger and smaller, nasal posterior upper, guttate), meningitis to the middle and anterior cranium. Mandibular nerve - V3: buccal, anterior-temporal: (facial, anterior, external auditory canal, synovial joint joint), lingual, alveolar lower, aortic to the anterior and middle cranial fossa, medial posterior: (to tensor veli palatini, to tensor veli tympani), chewing, temporal deep, lateral lateral, up to mylohyoideus, to the abdomen of the anterior twin-dung. Extra XI nerve (accessorius) - its nuclei lie in the spinal cord, range of supply. Nerve XII sublingual (hypoglossus) range of procurement. Triangle n. Sublingual at the bottom of the IV chamber.

Exercise 13: The sclerolus, cornea - layers and innervation, conjunctival and eyelid conjunctiva, conjunctival sac, eyelid apparatus. Membrane - choroidea, terms: uvea, iris, corpus ciliare. The front and back chamber of the eye. Production, absorption and circulation of eye fluid. Glaucoma. Eye as an optical device. The concept of diopter, the refractive power of lenses, lens defects. Optical defects of the eye: short and far-sightedness, long-sightedness, astigmatism, spherical and chromatic aberration. Lens - layers. Endosperm and cataract (cataracta). Retina, its parts, crotchets and layers: pigmentary and neuronal. Retinal layers. Blind spot, macula yellow. The formation of the optic nerve. The way of sight. Receptors - retinal and reticular rod cells. Nn. cranial III, IV, VI, and motor, autonomic and sensory innervation of the eye. Third oculomorphous nerve (oculomotorius). It supplies four of the six outer muscles of the eye, upper eyelid levator (levator palpebrae superioris), pupil sphincter (constrictor pupillae) and ciliary muscle. Tier IV nerve (trochlearis). Nerve VI abductor (abducens) supplying the simple side eye.

Exercise 14: Division: external, middle and internal ear. Elements of the structure of the outer ear, the external auditory canal. Cylinder pit - division into pneumatic spaces. The walls of the tympanic cavity, tympanic contents: auditory ossicles and their connections. Eardrum - acoustic mechanics in the middle ear. Inner and outer ear midlife and clinical consequences. Hearing receptor - Corti's organ. Endolimfa. Perylimfa. The mechanism of hearing - the way of hearing. The mechanism of registration of head movements in space. The complexity of balance. Construction of the organ of Corti. Series of internal and external cells. The Corti tunnel. The role of internal and external cells. Stereocillia. Hearing (multieuronic) route: receptors - the internal nerve-like hair cells of the snail (organ Corti). The first neuron - bipolar cells of the spiral coil of the snail (ganglion spirals cochleae). Second neuron - abdominal and dorsal cochlear nucleus. Third Neuron - lateral testicle nucleus, nucleus of the trapezius body, olives nucleus, lower mucus nuclei. The "fourth" neuron - the nucleus of the medial knee-shaped body. The axons of these cells form the auditory radiance that runs through the posterior part of the inner capsule to the transverse temporal curves - the center of hearing. The sidebone - the fibers of the auditory path that cross in the bridge and the midbrain. The vestibular part of the bone maze: the vestibule and the three semicircular canals. Łagiewka, small bag, semicircular wires. Kinetic labyrinth (reacting mainly to angular movements of the head). Static labyrinth (mainly reacting to linear accelerations in different directions and tilting of the head without rotation). Clusters of support and sensory cells. Freckle spot, pouch spot. Otolites (otoconia - ear dust), otolithica membrane. The vestibular pathway. The first neuron - atrial ganglion cells (vestibulare ganglion) in the inner auditory canal. Second neuron - vestibular nuclei at the border of the bridge and the core. Lower kernel (also spinal, descending), medial, lateral (Deiters) and upper. Third Neuron and Cortical Center - vestibular pathways to the hill. Cortical center in the parietal lobe.

Exercise 15: Cervical plexus: abdominal branches nn. C1-C4 core. Skin branches of the cervical plexus (occipital smaller, greater ear, transverse neck, supraclavicular). Short moving fibers up to mm. pre-vertebral neck, lateral group mm. neck and mm. straight neck. Ansa cervicalis. Diaphragmatic nerve (n.phrenicus) Posterior cervical plexus (plexus cervicalis posterior), nerves: suboccipitalis, major occipital nerve (occipitalis major) and occipitalis third. Shoulder plexus: fusion of abdominal branches spinal C5-Th, three trunks of plexus. Upper trunk C5-C6, middle trunk - C7, lower trunk C8-Th1. Stems form from the trunks, and from the branches of the bundles - individual nerves. The position of the plexus - the lateral side of the neck, axillary cavity, scapular mantle. From the supraclavicular part they pass: n. Dorsal shoulder blade, n supra-abdomen, n. Subclavian, niphthalmic long, nn. Chest, lateral, lateral, medial nora, n. coned, thoracic dorsal and branches up to mm. sloping and long neck. From the subclavian part: musculo-cutaneous n., Median n., Elbow n., Cutaneous medial forearm, upper arm, radial nodule, axillary n. Topography of the weave branch. Range of innervation. Nn. intercostal. Vascular and nervous bunch. Principles of puncturing and cutting intercostal spaces. The scope of innervation of the chest wall, abdominal wall, chest and abdominal skin (sensory), pleura and wall peritoneum. Branches nn. intercostal - muscular, cutaneous lateral and anterior, pleural and peritoneal, joint and periosteal. Lumbar-sacral plexus: part - upper, lumbar and lower plexus, sacral plexus. Lumbar spine (plexus lumbalis), abdominal branches nn. spinal L1-L4 (sometimes Th12-

L4). Branches short, hh. muscular (ie, trapezius lumbar, lumbar major, lumbar minor, mm lateral lateral).

Long branches:

- 1) n. Hip and abdomen (n. Iliohypogastricus),
- 2) iliac-inguinal (n. Ilioinguinalis),
- 3) n. Sex-femoral (n. Genito-femoralis),
- 4) n. Dermal lateral thigh (n. Cutaneus femoris lateralis),
- 5) n. Curtain (n. Obturatorius) and
- 6) femoral (n. Femoralis).

The scope of innervation and the course of these nerves.

Cross plexus (plexus sacralis): abdominal branches of lumbar and sacral spinal nerves.

Short branches, supply range: pear-shaped muscle, inner binder, four-sided thighs and both mm. twins, as well as the hip joint, the periosteum of the ischial tumor and both thigh trochans.

Long branches:

- 1) upper gluteal nerve (n. Gluteus superior),
- 2) n. Bottom gluteus (n. Gluteus inferior),
- 3) cutaneous thigh nerve (n. Cutaneus femoris posterior),
- 4) sciatic nerve (n. Ischiadicus),
- 5) the pudendal nerve (n. Pudendus) and
- 6) n. Nodular (n. Coccygeus).

Feeling and its types:

A) Special (smell, taste, sight, hearing, vestibular stimuli = linear and angular displacement of the head in space.

B) General, that is: 1) deep (from proprioceptors in muscles, tendons, ligaments, etc.), 2) superficial (pain - other than visceral, heat, cold, pruritus, some sexual sensations, touch, pressure, vibration), 3) visceral pain including thoracic and abdominal parenchyma, vessel walls and other information necessary for non-conscious autonomous regulation - about secretions, pH, osmolarity, oxygen saturation, etc.

Test 3

C. Seminars

Course contents

Skull - general construction.

Detailed skull construction.

Mouth. Nose and nasal cavity. Paranasal sinuses. The palate is hard and soft. Throat.

Central nervous system.

Internal structure of the cerebral hemispheres.

Brain stem (midbrain, bridge, prolonged core).

Test 1

Cerebellum. Mesh creation.

Spinal cord. Roads of any movements.

Spinal nerve. Autonomic nervous system.
Vascularization of the brain and spinal cord.

Test 2

Autonomic nervous system.
Nerves of the skull.
Sensory organs. Eye. Layer structure of the eye.
Ear - construction.
The peripheral nervous system. Strands, rolls, nerves, receptors.

Test 3

3.4 TEACHING METHODS

Communicative methods

Lecture: 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	Prosective exercises, seminars
EK_02	Colloquium, exam	Exercises, lectures
EK_03	COLLOQUIUM, PRACTICAL EXAM, TEST EXAM	Exercises, seminars, lectures

EK_04	Observation during classes, colloquium, test exam	Lectures, exercises, seminars
EK_05	Colloquium, exam	exercises, seminars
EK_06	Observation during the course of the prosector classes, colloquium, exam	Lectures, exercises, seminars
EK_07	Colloquium, practical exam	exercises,
EK_08	Observation during the course of the prosector classes, practical exam, test exam	Prosective exercises, seminars

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 can not 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	

1. 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 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