KHARKIV NATIONAL MEDICAL UNIVERSITY

SYLLABUS OF THE EDUCATIONAL COMPONENT
HUMAN ANATOMY

Speciality: **222 "Medicine"**
Educational and professional program: **Medicine**
Component code in the educational program: **MC 7**
Higher education level: **second (master's)**
Form of education: **full-time**
Year of study: **2nd**
Semester(s): **III (autumn)**
Type of educational component: **mandatory**
Academic year: **2025-2026**

Volume: **5 credits ECTS (150 hours)**
Training sessions: **lectures, practical classes**
Final control: **exam**
Prerequisites: **a course of Biology of general education in high school**

Department/Unit: **Department of Human Anatomy, Clinical Anatomy and Operative Surgery,** 12 Nezalezhnosti Avenue
Head of the educational component: **Assoc. Prof. Olga Sazonova**, om.sazonova@knmu.edu.ua
Page of the educational component in the Distance Learning System of KhNMU (Moodle): https://distance.knmu.edu.ua/course/view.php?id=5111

DESCRIPTION OF THE EDUCATIONAL COMPONENT

The study of the educational component "Human Anatomy" for physicians is a classical model of a university course adapted to the needs of medicine, which provides for each student to acquire knowledge in the world of natural science concepts about the structure and functions of the human body as a whole, the ability to use the acquired knowledge in the further study of other fundamental sciences of medicine, and in the practical activities of a doctor.

PURPOSE OF THE COURSE: acquisition by each student of knowledge of anatomy in the world of natural science ideas about the structure and functions of the human body as a whole, the ability to use the acquired knowledge in the further study of other fundamental sciences of medicine, and in the practical activities of a doctor.

LEARNING OUTCOMES: The training of a future medical specialist aims to develop a competent, highly professional, and morally mature specialist capable of effectively applying their knowledge and skills in healthcare.

1. **Acquisition of a system of knowledge and competencies.** Ensuring the acquisition of deep general, special, fundamental and professionally oriented knowledge, skills and abilities necessary for the high-quality performance of typical professional tasks related to activities in the medical field in the relevant position.
2. **Understanding the psychophysiological foundations of human health.** Acquiring knowledge about the psychophysiological characteristics of a person, the principles of preserving and strengthening health, disease prevention, treatment methods, as well as the laws of forming and maintaining the health of the population.
3. **Professional assessment of the patient's condition.** Formation of the ability to comprehensively evaluate the results of a patient interview, physical examination, laboratory and instrumental studies to determine the state of health and timely detection of pathological changes.
4. **Fostering ethical and moral responsibility.** Formation of a specialist with high professional and personal qualities who adheres to the principles of humanism, professional ethics, and the provisions of the doctor's code of ethics.

CONTENT OF THE EDUCATIONAL COMPONENT

List of lecture topics (10 hours):

1. Anatomy of the autonomic nervous system. Morpho-functional features of the structure, blood supply and innervation of the human body.
2. Vessels and nerves of the head and neck.
3. Vessels and nerves of the upper extremity.
4. Vessels and nerves of the thoracic and abdominal cavities.
5. Vessels and nerves of the pelvis and lower extremities.

List of topics of practical classes (100 hours):

1. Embryogenesis of the spinal cord. Anatomy of the spinal cord. Formation of the spinal nerve. Embryogenesis of the brain. General anatomy of the brain. The base of the brain. Test and situational tasks on the topic.
2. Endbrain anatomy. Sulci and gyri of the big hemispheres. Localization of functions in the cerebral cortex. Test and situational tasks on the topic.
3. Rhinencephalon. Callous body. Fornix. Basal nuclei. Lateral ventricles. White medullary substance of the hemispheres. Test and situational tasks on the topic.
4. Anatomy of the diencephalon and midbrain. Test and situational tasks on the topic.
5. Anatomy of the hindbrain. Test and situational tasks on the topic.
6. Anatomy of the medulla oblongata. IV ventricle. Rhomboid fossa. Meninges of the brain and spinal cord and their derivatives. Sinuses. Cisternaes. Formation and circulation of cerebrospinal fluid. Test and situational tasks on the topic.
7. Conducting tracts of the CNS (ascending and descending). Test and situational tasks on the topic.
8. General aesthesiology. I pair of cranial nerves. Organ of smell. Auxiliary apparatus of the organ of vision. III, IV and VI pairs of cranial nerves. Test and situational tasks on the topic.
9. Anatomy of the eye. Conducting tract of the visual analyzer. II pair of cranial nerves. Test and situational tasks on the topic.
10. Anatomy of the ear. Pathway of sound conduction. VIII pair of cranial nerves. Test and situational tasks on the topic.
11. Anatomy of the organ of taste. VII pair of cranial nerves. IX, X, XI and XII pairs of cranial nerves. Test and situational tasks on the topic.
12. V pair of cranial nerves. Vegetative nodes of the head. Test and situational tasks on the topic.
13. Concluding class: "Anatomy of the CNS. Sensory organs and cranial nerves.
14. General principles of the vascular system structure and function. Anatomical classification of the arteries (main, extraorganic, intraorganic). Classification of arteries by the wall structure. Types of arterial branching. The concept of collateral (bypass) blood flow. Age features of arteries. Anatomical classification of veins (main, extraorganic, intraorganic). Classification of veins by wall structure. Superficial veins, deep veins. Venous networks, venous plexuses. Vessels of a hemomicrocirculatory bed, structure of their wall and function. Lymphatic vessels, principles of their structure, functions.
15. Anatomy of the autonomic nervous system. General patterns of structure and function. Sympathetic and parasympathetic parts of the autonomic nervous system: morphological, functional differences, objects of innervation. Centers of the autonomic nervous system in the brain and spinal cord. Peripheral part of the autonomic nervous system: vegetative nodes, nerves, vegetative plexuses.
16. Aorta. Branches of the aortic arch. Common and external carotid arteries. Subcutaneous veins of the neck. Cervical plexus. Test and situational tasks on the topic.
17. Internal carotid artery, internal jugular vein. Common facial vein. X pair of cranial nerves (head and neck). Vasculonervous fasciculus of the neck. Cervical part of the sympathetic trunk. Test and situational tasks on the topic.
18. Brachial plexus. Subclavian and axillary arteries and veins. Test and situational tasks on the topic.

19. Vessels and nerves of the free part of the upper limb. Topography of vasculonervous fasciculus of the upper extremity. Test and situational tasks on the topic.

20. Thoracic aorta. Superior vena cava. Azygos and hemiazygos veins. Intercostal nerves. X pair of cranial nerves (thoracic part). Thoracic part of sympathetic trunk. Nerve plexuses of the thoracic cavity. Test and situational tasks on the topic.

21. Abdominal aorta. Inferior vena cava and portal vein. Intersystemic venous anastomoses. Vegetative plexuses of the abdominal cavity. Test and situational tasks on the topic.

22. Common, external and internal iliac arteries. Blood supply to the pelvic organs. Common, external and internal iliac veins. Features of venous outflow from the pelvic organs. Test and situational tasks on the topic.

23. Lumbar, sacral and coccygeal plexuses. Vegetative nerve plexuses of the pelvis. Test and situational tasks on the topic.

24. Vessels of the free part of the lower extremity. Topography of the vasculonervous fasciculus of the lower limb. Test and situational tasks on the topic.

25. Concluding class "Vessels and nerves of the head, neck, trunk and extremities." Computer testing based on KROK-1 (materials of I, II and III semesters).

List of topics of independent work of the student (40 hours)

1. possess the ability to demonstrate on preparations the external structure of the brain and spinal cord.

2. possess the ability to draw a diagram of simple and complex neural circuits

3. possess the ability to draw a diagram of the internal structure of the spinal cord; distinguish the structure of the gray matter of the spinal cord; distinguish the structure of the white matter of the spinal cord.

4. possess the ability to draw a diagram of the structure of the spinal nerve.

5. possess the ability to draw a rhombic structure diagram derivatives and mesencephalon; diagram of the structure of gray and white matter of the medulla oblongata; circuit structure of gray and white matter of the bridge; structure diagram of the gray matter of the cerebellum; diagram of the structure of gray and white matter of the midbrain.

6. Master the ability to draw from the hem accommodation cranial nerve nuclei in the rhomboid fossa.

7. Master the ability to draw scheme topography conductive paths inside the capsule.

8. Master the ability to draw a diagram: ascending conductive pathways of the cortical areas; ascending pathways cerebellar direction.

9. Master the ability to draw a diagram: descending pyramidal tract systems; descending tract of the extrapyramidal system.

10. To capture the ability to draw diagrams of the brain and spinal cord intermeningeal spaces.

11. possess the ability to demonstrate on preparations structure of sensory organs.

12. Master the ability to draw a diagram: pathways of the visual analyzer;

13. To capture the ability to draw the conductive circuit paths of hearing and balance.

14. possess the ability to draw a diagram of the general structure of the cranial nerves, brain derivatives.

15. possess the ability to draw a diagram of the structure of mixed cranial nerves.

16. possess the ability to draw structure diagrams I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII cranial nerves.

17. possess the ability to demonstrate on preparations the cranial nerves.

18. Preparation of a review of the scientific literature or conducting scientific research (optional): Options and malformations of the digestive system; Options and malformations of the respiratory system Variants and anomalies of the urinary tract; Variants and anomalies of the organs of the male reproductive system; Options and abnormal development of the female reproductive system; Variants and anomalies of the organs of the immune and endocrine systems; Variants and anomalies of the spinal cord and its matters; Variants and anomalies of brain development and matters; Variants and anomalies

of the organ of vision; Variants and anomalies of the organ of hearing; Ways of lymph drainage from the abdominal cavity; The structure of the cranial nerves.

19. possess the ability to demonstrate on preparations the vessels of the head and neck.
20. Master the ability to draw general building scheme vegetative head node.
21. Master the ability to demonstrate on preparations: Containers of the thoracic cavity; Containers of the abdominal cavity; vessels of the pelvic cavity.
22. Master the ability to draw the structure diagram of the reflex arc VNS.
23. To capture the ability to draw circuit the structure of the autonomic nervous system
24. Master the ability to draw a general scheme of the relationship between the central and peripheral sympathetic parts of the VNS departments.
25. Master the ability to draw general scheme of the relationship between central and peripheral parasympathetic divisions portion VNS
26. Master the ability to draw a structural scheme of the vegetative plexus of the abdomen and pelvic cavity.
27. Master the ability to demonstrate on preparations: The vessels of the upper limbs and lower extremities.
28. Master the ability to demonstrate on preparations: December nerves; cervical plexus branches; the branches of the brachial plexus; the branches of the lumbar plexus; the branches of the sacral and coccygeal plexus.
29. Preparation of a review of the scientific literature or conducting scientific research (optional). Abnormal development of blood vessels; Developmental anomalies of the veins; Anatomy of blood vessels
30. Exam preparation

The IWS is aimed at deepening and consolidating the theoretical knowledge gained during classroom training and contributing to the formation of professional competencies. The results of the IWS are subject to control and are included in the final control of knowledge.

Consultations: online, according to the department's schedule, with invitations sent to corporate email and added to Google Calendar.

Teaching methods: lectures in video or live broadcast format, use of presentations, interactive diagrams to visualize the structure of organs, simulators of organs and systems to practice the structure, use of tests and tasks with instant knowledge testing.

EVALUATION

Current Learning Activities (CLA). Assessment of the success of education seekers is carried out in accordance with the Instructions for assessing the educational activities of higher education seekers at KhNMU(https://knmu.edu.ua/doc_block_type/instrukcziyi-navchalnogo-proczesu/). When evaluating the mastery of each academic topic in the educational component (EP) and the final lesson (SSS), the applicant is given a grade on a traditional 4-point scale: "excellent", "good", "satisfactory", and "unsatisfactory".

The final score for (CEA) and final lessons (CC) is determined as the arithmetic mean of traditional grades for each lesson and CC, rounded to 2 decimal places and converted into a multi-point scale according to the tables.

Unsatisfactory grades are worked out in accordance with the Regulations on the procedure for working out academic classes by students of KhNMU(chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://knmu.edu.ua/wp-content/uploads/2021/05/pol_por-vidprac-zaniat.pdf).

Individual tasks (IT). Individual student tasks (hereinafter referred to as IST) are not mandatory; however, if the student wishes, they can be completed and evaluated in ECTS points (no more than 10), which are added to the total points scored for current educational activities. At the department meeting,

a list of individual tasks (participation in student conferences and specialized Olympiads, preparation of analytical reviews with presentations and plagiarism checks) was approved, specifying the number of points for their completion, which can be used as incentives (no more than 10).

Final control. The final lesson (hereinafter referred to as the CC) must be held in accordance with the working curriculum for the educational component during the semester according to the schedule, during classes. The CC is accepted by the academic group's teacher. The department has provided the following materials for CC preparation on the Moodle platform: a list of theoretical questions, a list of practical skills, test tasks, and criteria for assessing applicants' knowledge and skills.

Grade in subject (GS). The discipline is studied over 3 semesters, the grade for the educational component is determined as the arithmetic average of the points for the three semesters during which the discipline was studied, which are converted into a 120-point ECTS scale with the addition of points obtained directly in the exam, the minimum number of points is 50; the maximum is 80. The maximum number of points that an applicant can score for studying the educational component is 200 points, including the maximum number of points for current educational activities - 120 points, as well as the maximum number of points based on the exam results - 80 points. The minimum number of points is 120, including 70 points for the minimum current educational activities and 50 points based on the exam results. Grade for the discipline - is the sum of the points for the PND and the exam, from min - 120 to max - 200, and corresponds to the traditional assessment: "satisfactory", "good", "excellent". The number of points received by the applicant in the educational component is further evaluated on a 200-point scale, ECTS and the traditional system (“satisfactory”, “good”, “excellent”.

Appealing the results of the final control is carried out in accordance with the procedure established in KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_apel_kontrol.pdf).

POLICIES OF THE EDUCATIONAL COMPONENT

Recommendations for working on the course: actively participate in all types of work in classes, devote time every day to independent preparation and completion of tasks, do not be shy about asking questions during classes, attend consultations, submit assignments on time, and complete all forms of knowledge control.

Attending classes. Regular attendance at classes is a prerequisite for mastering the material. The student must be present at all lectures and practical classes. Missing classes without a good reason is not allowed and may affect the PND. In case of absence for good reason, the student must independently work through the missed material and attend classes with the teacher of his group, or the teacher on duty, according to the schedule and through the ACS record. Missed classes are made up in accordance with the Regulations on the procedure for making up classes by students of KhNMU (chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://knmu.edu.ua/wp-content/uploads/2021/05/pol_por-vidprac-zaniat.pdf).

Academic integrity. KhNMU stands on the position of zero tolerance for manifestations of academic dishonesty. Any violations of the principles of academic integrity entail responsibility in accordance with the procedure established by KhNMU (https://knmu.edu.ua/wp-content/uploads/2021/05/polog_ad-1.pdf).

Use of electronic gadgets and artificial intelligence tools. During classes, it is allowed to use electronic devices (laptops, tablets, smartphones) only for educational purposes - to take notes, search for educational information or perform tasks related to the topic of the class. Using gadgets in a way that distracts from the educational process or interferes with other participants is prohibited. The use of artificial intelligence tools is allowed only to assist in learning - to search, summarize or verify information, prepare for classes, etc. It is prohibited to use AI to perform individual or test work instead of one's own intellectual activity.

Policy on persons with special educational needs. The educational process is ensured by adhering to the principles of equality and accessibility. Students with special educational needs are provided with conditions for full participation in education, taking into account individual capabilities, health status, and specific needs.

Teacher Response Time: 24 hours.

Technical requirements for the course:

- access to a computer, laptop, tablet or smartphone
- Corporate Google account with your own photo
- skills in working with Google Workspace (Google Meet, Docs, Sheets, Slides, Forms) and Moodle
- *other requirements of the department*

Technical support: ASM (ev.shevtsov@knmu.edu.ua), Google (tehotdelknmu@gmail.com), Moodle (al.korol@knmu.edu.ua)

RECOMMENDED SOURCES

1. Human Anatomy: textbook: in 3 volumes / A. S. Holovatsky, V. G. Cherkasov, M. R. Sapin [and others]. – 7th ed., revised. – Vinnytsia: Nova Knyga, 2019.
2. Human Anatomy: textbook / [Kryvko Yu. Ya., Cherkasov V. G., Kravchuk S. Yu. Sopneva N. B. and others]; edited by: Prof. Kryvka Yu. Ya., Prof. Cherkasova V. G. – Vinnytsia: Nova Knyga, 2020. – 448p.
3. Human Anatomy: Textbook / S. M. Bilash, M. M. Koptev, O. M. Pronina, O. M. Belyaeva ... - Kyiv: "Medicine", 2023. - 279 p.
4. Extbooks and Reference Books**Gray, H.***Gray's Anatomy for Students*- 4th edition, Elsevier, 2020. - 1072 p.
5. Rohen, JW, Yokochi, C., Lütjen-Drecoll, E.Color Atlas of Anatomy: A Photographic Study of the Human Body – 8th edition, Wolters Kluwer, 2021.
6. Human Anatomy, Global Edition / Elaine Marieb, John Mallatt, Patricia Brady – Pearson, edition ~2019–2020.
7. Netter, F.H.Atlas of Human Anatomy - 7th edition, Elsevier, 2019. - 608 p.

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