

AMENDMENTS AND CHANGES TO THE CURRICULUM IN THE EDUCATIONAL DISCIPLINE

«Normal physiology»

for the specialty 07-07-0911-03 «Dentistry»
for 2024/2025 academic year

Amendments and changes	Basis/Reason
1. Changes have been introduced into the Explanatory Note (appendix 1)	Educational Plan for 2024/2025 academic year
2. Changes have been introduced into the Thematic Plan (appendix 2)	Educational Plan for 2024/2025 academic year
3. Changes have been introduced into the Educational Discipline Curricular Chart (appendix 3)	Educational Plan for 2024/2025 academic year
4. Changes have been introduced into the List of Practical Skills (appendix 4)	Educational Plan for 2024/2025 academic year

The curriculum is revised and approved at the department meeting *Normal physiology*
(protocol №20 of 23 May 2024)

Head of the department of *normal physiology*

V. A. Pereverzev

APPROVED

Dean of *Medical Faculty for International Students*

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Changes in the Explanatory Note

Total number of hours for the study of the discipline is 210 academic hours, of which 135 classroom hours and 75 hours of student independent work. Classroom hours according to the types of studies: lectures - 30 hours (including 9 hours of supervised student independent work (SSIW)), practical classes - 105 hours.

ALLOCATION OF ACADEMIC TIME ACCORDING TO SEMESTERS OF STUDY

Code, name of the specialty	semester	Number of academic hours						Form of intermediate assessment
		total	in-class	including			out-of-class self-studies	
				lectures	supervised student independent work	practical classes		
7-07-0911-03 «Dentistry»	2	102	69	12	3	54	33	credit
	3	108	66	9	6	51	42	exam

THEMATIC PLAN

Section (topic) name	Number of class hours	
	lectures (incl. SSIW)	practical
1. Introduction in the academic discipline «Normal Physiology». The basic concepts of physiology. Principles of biomedical ethics	0,75	3
1.1. The subject and tasks of Normal Physiology. Fluid media. Physiology of the blood system	0,75	—
1.2. Introduction. The subject and tasks of Normal Physiology. Homeostasis. Physic-chemical properties of blood.	—	3
2. The internal environment of the human body. Physiology of the blood	0,75	9
2.1. The subject and tasks of Normal Physiology. Fluid media. Physiology of the blood system	0,75	—
2.2. Physiological functions of red blood cells. Hematopoiesis. Erythrocytopoiesis. Physiological functions of platelets. Thrombocytopoiesis. Hemostasis system.	—	3
2.3. Physiological functions of white blood cells. Leukopoiesis. Non-specific and specific resistance of the human body. Physiological evaluation of the complete blood count.	—	3
2.4. Blood types. ABO system. Rhesus (Rh) and other systems. Physiological bases of blood matching for the transfusion.	—	3
3. General physiology	6	18
3.1. Electrical signaling. Bioelectrical potentials.	1,5 (SSIW)	—
3.2. Conduction of excitation along nerve fibers, synaptic transmission	1,5	—
3.3. Physiology of skeletal and smooth muscles. Features of the muscles of the maxillofacial region	1,5	—
3.4. The concept of the regulation of physiological functions. General physiology of CNS	1,5	—
3.5. Electrical signaling. Laws of action of excitable tissues. Biological potential. Changes of excitability in excitation.	—	3
3.6. Conduction of excitation along nerve fibers. Neuro-muscular synapse.	—	3
3.7. Physiology of skeletal muscles.	—	3
3.8. Physiology of the muscles of the maxillofacial region. Smooth muscles. The concept of myoepithelial and glandular cells.	—	3

3.9. General physiology of the central nervous system.	—	6
4. Mechanism of physiological functions regulation	4,5	24
4.1. Chemical signaling. Basics of information exchange of the cell with the environment	1,5 (SSIW)	—
4.2. Physiology of endocrine system. Physiology of bone tissue and regulation of calcium-phosphorus metabolism	1,5	—
4.3. Nervous regulation of autonomic functions	1,5	—
4.4. Fundamentals of information exchange of the cell with the environment. Chemical signaling. General physiology of endocrine system.	—	3
4.5. Special physiology of endocrine system.	—	3
4.6. Physiology of bone tissue and regulation of calcium-phosphorus metabolism.	—	6
4.7. The role and functions of spinal cord, brain stem, and cerebellum.	—	3
4.8. The role and functions of mesencephalon, forebrain.	—	3
4.9. Physiology of autonomic nervous system.	—	6
5. Physiology of circulation	4,5	12
5.1. Laws of hemodynamics. Blood pressure.	1,5	—
5.2. Methods of investigation of heart activity. Electrocardiography.	1,5 (SSIW)	—
5.3. Physiological properties and features of the myocardium. Regulation of cardiac activity	1,5	—
5.4. Hemodynamics. The main indices of the circulatory system. Microcirculation.	—	3
5.5. Physiological properties and features of heart muscle.	—	3
5.6. Cardiac cycle. Methods of heart function analysis.	—	3
5.7. Regulation of the heart function. Mechanism of regulation of systemic arterial blood pressure.	—	3
6. Physiology of respiration	3	9
6.1. Ventilation of the lungs. Gas exchange in the lungs and tissues.	1,5	—
6.2. Transport of gases by the blood. Regulation of respiration.	1,5 (SSIW)	—
6.3. External respiration. Gas exchange in the lungs and tissues.	—	3
6.4. Transport of gases. Regulation of respiration.	—	6
7. Physiology of digestion	3	6
7.1. Digestion in oral cavity and in stomach.	1,5	—
7.2. The role of liver and pancreas in digestion. Digestion in the small and large intestine.	1,5 (SSIW)	—
7.3. Nutritional motivations. Digestion in oral cavity and in stomach.	—	3
7.4. The role of liver and pancreas in digestion. Digestion in the small and large intestine.	—	3
8. Energy balance and metabolism. Principles of healthy nutrition	0,75	3

8.1. Energy balance and metabolism. Physiology of thermoregulation.	0.75	–
8.2. Energy balance and metabolism. Principles of healthy nutrition.	–	3
9. Thermoregulation	0,75	3
9.1. Energy balance and metabolism. Physiology of thermoregulation	0.75	–
9.2. Physiology of thermoregulation	–	3
10. Physiology of excretion	1,5	6
10.1. Physiology of excretion	1.5	–
10.2. Physiology of excretion	–	6
11. Physiology of sensory systems	1,5	6
11.1. Physiology of sensory systems	1.5	–
11.2. General physiology of sensory systems. Physiology of the visual system.	–	3
11.3. Special physiology of sensory systems. Sensory function of mucous membranes and structural formations of the oral cavity	–	3
12. Integrative brain activity	3	6
12.1. Integrative functions of the brain	1.5	–
12.2. Higher integrative functions of brain as physiological basics psychological functions.	1.5 (SSIW)	–
12.3. Integrative functions of the brain. Innate and acquired adaptive forms of behavior. Memory.	–	3
12.4. Physiological bases of psychological activity.	–	3
Total	30	105

ACADEMIC DISCIPLINE CURRICULAR CHART

Section, topic #	Section (topic) name	Number of hours		Supervised student work	Practical skills	Form of control	
		lectures	practical			of practical skills	of current / intermediate assessment
2 semester							
Lectures							
1.	The subject and tasks of Normal Physiology. Fluid media. Physiology of the blood system	1.5					
2.	Chemical signaling. Basics of information exchange of the cell with the environment			1.5			
3.	Physiology of endocrine system. Physiology of bone tissue and regulation of calcium-phosphorus metabolism	1.5					
4.	Electrical signaling. Bioelectrogenesis			1.5			
5.	Conduction of excitation along nerve fibers. synaptic transmission	1.5					
6.	Physiology of skeletal and smooth muscles. Features of the muscles of the maxillofacial region	1.5					
7.	The concept of the regulation of physiological functions. General physiology of CNS	1.5					
8.	Nervous regulation of autonomic functions	1.5					

9.	Laws of hemodynamics. Blood pressure. Physiological properties and characteristics of the myocardium	1,5					
10.	Regulation of cardiac activity. Mechanisms of regulation of systemic arterial pressure Practical classes	1,5					
1.	Introduction. The subject and tasks of Normal Physiology. Homeostasis. Physic-chemical properties of blood. Practical works: Technique of taking capillary blood (demonstration). Safety rules for infection prevention Hematocrit analysis (demonstration). Hemolysis and its types (demonstration).	3	–	Measures to prevent infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis. Physiological assessment of parameters in complete blood count (hematocrit).	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.	
2.	Physiological functions of red blood cells. Hematopoiesis. Erythrocytogenesis. Physiological functions of platelets. Thrombocytopoiesis. Hemostasis system. Practical works: Red blood cells count in the counting chamber under the microscope (demonstration).	3	–	Measures to prevent infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written	

Evaluation of the amount of hemoglobin by Sahli's method (demonstration). Evaluation of Color Index and MCH. Evaluation and physiological assessment of primary hemostasis indices.			Physiological assessment of parameters in complete blood count (red blood cells count, hemoglobin, color index and RBC indices, platelets count). Assessment of primary hemostasis indices (barclage test). Features of bleeding duration from the tooth cavity.		reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
3. Physiological functions of white blood cells. Leukopoiesis. Non-specific and specific resistance of the human body. Physiological evaluation of the complete blood count. Practical works: ESR analysis by Panchenkov's method (demonstration). White blood cells count in the counting chamber under the microscope Percentage calculation of different types of white blood cells in a blood smear (leukocyte formula). Physiological assessment of the complete blood count.	3	–	Measures to prevent infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis. Physiological assessment of parameters in complete blood count.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
4. Blood types. ABO system. Rhesus (Rh) and	3	–	Measures to prevent	Practical works. *	Interviews, reports

other systems. Physiological bases of blood matching for the transfusion. Practical works: Blood typing in the ABO system using standard sera (demonstration). Blood typing in Rhesus system (demonstration). Blood typing in the ABO system using monoclonal sera.			infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis. Assessment of result of blood typing in ABO and Rh systems using standard sera and monoclonal antibodies.	Situational problem solving, including usage case-method.	in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
5. Fundamentals of information exchange of the cell with the environment. Chemical signaling. General physiology of endocrine system. Practical works: Human height measurement. Assessment of endocrine system functions based on cortisol and adrenocorticotrophic hormone concentration in blood plasma	3	–	Measurement and evaluation of height. Evaluation of endocrine system functions (height as index of endocrine axis hypothalamus-pituitary-liver).	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works

						with its oral defense, electronic practical books, visual practical works.
6.	Special physiology of endocrine system (thyroid glands, adrenals, pancreas, sex glands) Practical works: Comparison of arm muscle strength in men and women. Analysis of the effect of catecholamines as hormones (of adrenal medulla) and as neurotransmitters (of the sympathetic part of ANS) on cardiovascular system	3	–	Evaluation of endocrine system functions (comparison of muscle strength of men and women, axis hypothalamus-pituitary-sex glands).	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works. ✱
7.	Physiology of bone tissue and regulation of calcium-phosphorus metabolism. Practical works: Assessment of a dental formula. Occlusion analysis. The effect of female sex hormones on bone mineralization.	3	–	Evaluation of dental formula of primary and permanent teeth.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols)

						for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
8.	Concluding lesson on the sections «Introduction in the academic discipline «Normal Physiology». The basic concepts. The principles of biomedical ethics», «The internal environment of the human body. Physiology of the blood», «Mechanism of physiological functions regulation»	3	–	Measures to prevent infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis. Physiological assessment of parameters in complete blood count obtained by using manual and semi-automatic methods of counting (red blood cells count, hematocrit, hemoglobin, color index and RBC indices, white blood cells count and leukocyte formula, platelet count. Panchenkov's ESR method).		Reports of in-class practical works with its oral defense, control interviews, colloquiums, electronic tests, reports of home practical works with its oral defense, reports of practical works with its oral defense, assessment based on modeling rating system.

9.	Electrical signaling. Laws of action of excitable tissues. Biological potential. Changes of excitability in excitation. Practical works: The effect of Na^+ and K^+ ions on the resting membrane potential and action potential. Virtual program "NMJ" ("neuro-muscular junction").	3	–	Assessment of primary hemostasis indices (bandage test). Features of bleeding duration from the tooth cavity. Assessment of result of blood typing in AB0 and Rh systems using standard sera and monoclonal antibodies. Measurement and evaluation of height. Evaluation of endocrine system functions (height as index of endocrine axis hypothalamus-pituitary-liver). Evaluation of endocrine system functions (comparison of muscle strength of men and women, axis hypothalamus-pituitary-sex glands). Assessment of extracellular concentration of K^+ and Na^+ shifts on membrane potential values.	Practical works. Situational problem solving, including usage case-method.*	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols)
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							for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
10.	Conduction of excitation along nerve fibers. Neuro-muscular synapse. Practical works: Demonstration of the effect of local anesthetics depending on the time of action	3	–	Possibility of pharmacological effect on process of signal transmission in synapses (example of neuro-muscular junction).	Situational problem solving, including usage case-method.		Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
11.	Physiology of skeletal muscles. Practical works: Contraction of motor units and muscle as a	3	–	Dynamometry (manual and standing) and physiological	Practical works. Situational problem solving, including		Interviews, reports in practical classes, tests, control

whole.			evaluation of the results.	usage case-method.	interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
12.	Physiology of the muscles of the maxillofacial region. Smooth muscles. The concept of myoepithelial and glandular cells. Practical works: Electromyography of the muscles of mastication Studying the movements of the lower jaw in different planes. (Gothic arch). Assessment of interocclusal space. The occlusion (in Dentistry)	3	Features of innervation of skeletal and smooth muscles and impact of neurotransmitters.	Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic

13.	General physiology of the central nervous system. Practical works: Studying of knee reflex.	3	–	Study of the main tendon reflexes on the example of the knee reflex (morphological basis [reflex arc]). Physiological assessment of the obtained data.	Practical works. Situational problem solving, including usage case-method.	practical books, visual practical works. Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
14.	Concluding lesson on section «General Physiology»	3	–	Assessment of extracellular concentration of K^{+} and Na^{+} shifts on membrane potential values. Possibility of pharmacological effect on process of signal transmission in synapses (example of	Practical works. Situational problem solving, including usage case-method.	Reports of in-class practical works with its oral defense, control interviews, colloquiums, electronic tests, reports of home practical works with its oral defense, reports of

				neuro-muscular junction). Dynamometry (manual and standing) and physiological evaluation of the results. Features of innervation of skeletal and smooth muscles and impact of neurotransmitters. Study of the main tendon reflexes on the example of the knee reflex (morphological basis [reflex arc]). Physiological assessment of the obtained data.		practical works with its oral defense, assessment based on modeling rating system ★
15.	The role and functions of spinal cord, brain stem, and cerebellum. Practical works: Studying of some tendon reflexes in humans (mandibular, upper limb flexor reflex, upper limb extensor reflex) Studying the cerebellum functions Studying the motor functions of some cranial nerves Studying the pupillary reflexes	3	–	Study of the main tendon reflexes on the example of the knee reflex (morphological basis [reflex arc]). Physiological assessment of the obtained data. Comparison of mono- and polysynaptic reflexes.	Practical works. Situational problem solving, including usage case-method. Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works	

						with its oral defense, electronic practical books, visual practical works.
16.	The role and functions of mesencephalon, forebrain. Practical works: Studying the tactile sensitivity in humans Studying the musculotendinous sensation Electroencephalography Studying the role of the intermediate and forebrain in the formation of sensory modalities	3	–	Evaluation of EEG rhythms in different functional states of the CNS.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
17.	Physiology of autonomic nervous system. Practical works: Assessment of Clinostatic reflex. Assessment of Orthostatic reflex. Assessment of Hering's respiratory-cardiac reflex. Assessment of neurotransmitter mechanisms of the effect of sympathetic and parasympathetic parts of ANS on the heart	3	–	Assessment of tone and reactivity of sympathetic and parasympathetic parts of ANS by heart rate on the example of clinostatic and orthostatic reflexes. Necessity of knowledge	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols)

functioning				of these reflexes for a dentist.		for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
18. Concluding lesson on the section «Mechanisms of regulation of physiological functions»	3	–	Study of the main tendon reflexes on the example of the knee reflex (morphological basis [reflex arc]). Physiological assessment of the obtained data. Evaluation of EEG rhythms in different functional states of the CNS. Assessment of tone and reactivity of sympathetic and parasympathetic parts of ANS by heart rate on the example of clinostatic and orthostatic reflexes. Necessity of knowledge of these reflexes for a dentist.	Practical works. Situational problem solving, including usage case-method.	Reports of in-class practical works with its oral defense, control interviews, colloquiums, electronic tests, reports of home practical works with its oral defense, reports of practical works with its oral defense, assessment based on modeling rating system. Credit.	

3 semester									
Lectures									
11.	Methods of investigation of heart activity. Electrocardiography.	–	1.5						
12.	Ventilation of the lungs. Gas exchange in the lungs and tissues.	1.5	–						
13.	Transport of gases by the blood. Regulation of respiration.	–	1.5						
14.	Physiology of digestion	1.5	–						
15.	The role of liver and pancreas in digestion. Digestion in the small and large intestine.	–	1.5						
16.	Energy balance and metabolism. Physiology of thermoregulation	1.5	–						
17.	Physiology of excretion	1.5	–						
18.	Physiology of sensory systems	1.5	–						
19.	Integrative functions of the brain	1.5	–						
20.	Higher integrative functions of brain as physiological basics psychological functions.	–	1.5						
Practical classes									
19.	Hemodynamics. The main indices of the circulatory system. Microcirculation. Practical works: Arterial pulse examination using the palpation method. Measurement of arterial blood pressure by Korotkoff's auscultation method and Riva-Rochi palpation method.	3	–			Properties of arterial pulse and assessment of its rhythmicity and frequency by palpation method. Measurement of arterial pressure values. Physiological assessment of obtained data.	Practical works. Situational problem solving, including usage case-method.*	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral	

						defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
20.	Physiological properties and features of heart muscle. Practical works: Studying the heart automaticity and various factors affecting it. Studying the mechanisms of generation of action potentials (AP) in the cells of the sinoatrial node and the cells of the contractile myocardium of the ventricles.	3	–	Mechanism of generation of action potential of typical and atypical cardiomyocyte.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
21.	Cardiac cycle. Methods of heart function analysis. Practical works: Analysis of cardiac cycle in rest and after physical activity. Influence of some substances on work of isolated frog heart.	3	–	Assessment of cardiac cycle duration at rest by ECG data. Physiological assessment of the obtained data.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical

Recording and analysis of ECG (calibration, speed motion of paper, heart rate). Studying the basics of polycardiography. Studying the basics of ultrasound examination of the heart.						works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
22. Regulation of the heart function. Mechanism of regulation of systemic arterial blood pressure. Practical works: Studying the parameters of arterial blood pressure during postural (orthostatic) baroreflex Analysis of some receptor and ion mechanisms of blood pressure and heart function regulation	3	–	Analysis of arterial pressure changes during conduction of orthostatic test.	Practical works. Situational problem solving, including usage case-method.		Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works. ★
23. External respiration. Gas exchange in the	3	–	Assessment of	Practical works.		Interviews, reports

lungs and tissues. Practical works: Studying the biomechanics of inspiration and exhalation on models. Spirometry. Spirography. Pneumotachometry (peakflowmetry). Studying the parameters of external respiration with automatic spirometer MAS-1				spirogram: vital capacity (VC) and due vital capacity (dVC).	Situational problem solving, including usage case-method.	in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
24. Transport of gases. Regulation of respiration. Practical works: Pulse oxymetry. Studying the role of breath holding on hemoglobin oxygenation. Effect of increasing CO ₂ in alveolar air on external respiration.	3	–		Pulseoxymetry conduction and physiologic assessment of obtained data.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works

25.	Concluding lesson on the sections «Physiology of circulation», «Physiology of respiration»	3	–	Properties of arterial pulse and assessment of its rhythmicity and frequency by palpation method. Measurement of arterial pressure values. Physiological assessment of obtained data. Mechanism of generation of action potential of typical cardiomyocyte and atypical cardiomyocyte. Assessment of cardiac cycle duration at rest by ECG data. Physiological assessment of the obtained data. Analysis of arterial pressure changes during conduction of orthostatic test. Spirometry: determination of vital capacity (VC), due vital	with its oral defense, electronic practical books, visual practical works. Reports of in-class practical works with its oral defense, control interviews, colloquiums, electronic tests, reports of home practical works with its oral defense, reports of practical works with its oral defense, assessment based on modeling rating system.
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	Analysis of blood plasma activity. Influence of sympathetic nervous system neurotransmitters on small intestine peristalsis and analysis of neurotransmitter mechanisms of excitation conduction on smooth intestinal muscles			impact on fats state.		reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
28.	Energy balance and metabolism. Principles of healthy nutrition. Practical works: Calculation of the Basal Metabolic Rate due values by tables and formulas Assessment of body mass. Diet planning and its assessment.	3	–	Measurement of body mass. Calculation of body mass index. Physiological assessment of the obtained data and formulation of scientifically based recommendations for the body weight correction. Principles of healthy diet based on body mass index (BMI) and total metabolism rate.	Practical works. Situational problem solving, including usage case-method.	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books. Interviews, reports
29.	Physiology of thermoregulation	3	–	Measurement of axial	Practical works.	Interviews, reports

Practical works: Measurement of the axillary body temperature. Assessment of heat sensitivity of teeth.			body temperature using liquid and electronic thermometers: analysis of possible errors during performance. Physiological assessment of the obtained data. Assessment of thermal sensitivity of teeth.	Situational problem solving, including usage case-method.	in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books.
30. Physiology of excretion. Practical works: Performing a common urine analysis using the express method	3	–	Physiologic assessment of the composition and properties of terminal urine. Common urine analysis.	Practical works. Situational problem solving, including usage case-method.*	Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic

31.	Concluding lesson on the sections «Physiology of digestion», «Energy balance and metabolism. Principles of healthy nutrition», «Thermoregulation», «Physiology of excretion»	3	–	Sialometry conduction and physiological assessment of the obtained data. Assessment of carbohydrate hydrolysis in different states (pH, t). Assessment of bile impact on fats state. Measurement of body mass. Calculation of body mass index. Physiological assessment of the obtained data and formulation of scientifically based recommendations for the body weight correction. Principles of healthy diet based on body mass index (BMI) and total metabolism rate. Measurement of axial body temperature using liquid and electronic thermometers: analysis of possible errors during performance.	practical books, visual practical works. Reports of in-class practical works with its oral defense, control interviews, colloquiums, electronic tests, reports of home practical works with its oral defense, reports of practical works with its oral defense, assessment based on modulating rating system.
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[illegible]

Studying some mechanisms of the sound source direction. Studying the bone and air conduction. Studying the dependence of auditory sensitivity on sound frequency (audiometry). Studying the tactile sensitivity. Esthesiometry (measurement of spatial thresholds). Studying the impact of the vestibular system on the somatic and autonomic functions of the body. Studying the taste sensitivity and rate of taste adaptation to basic taste substances.			functions: experiments of Weber and Rinne.	works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
34. Integrative functions of the brain. Innate and acquired adaptive forms of behavior. Memory. Practical works: Assessment of the associative memory volume. Assessment of a short-term auditory memory volume using letter and digit complexes in the human	3	–	Assessment of a short-term auditory memory volume using letter and digit complexes in the human.	Practical works. Situational problem solving, including usage case-method. reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books.

35.	Physiological bases of psychological activity. Practical works: Assessment of latent period of simple and complex sensorimotor reaction. Assessment of hemispheres functional asymmetry. Assessment of attention indices using a correction test. Studying the functional scheme of directive behavior.	3	–	Assessment of attention indices using a correction test.	Practical works. Situational problem solving, including usage case-method.	visual practical works. Interviews, reports in practical classes, tests, control interviews, control works, written reports for in-class (home) practical works, written reports (protocols) for practical works, reports of home practical works with its oral defense, reports of practical works with its oral defense, electronic practical books, visual practical works.
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**LIST OF PRACTICAL SKILLS IN EDUCATIONAL DISCIPLINE NORMAL PHYSIOLOGY
FOR SPECIALTY DENTISTRY**

Name of practical skill	Form of control of practical skill
Measures to prevent infection with viral hepatitis and human immunodeficiency virus (HIV) during the blood and other biological materials analysis.	Practical works. Situational problem solving, including usage case-method.
Physiological assessment of parameters in complete blood count obtained by using manual and semi-automatic methods of counting (red blood cells count, hematocrit, hemoglobin, color index and RBC indices, white blood cells count and leukocyte formula, platelet count, Panchenkov's ESR method).	Practical works. Situational problem solving, including usage case-method.
Assessment of primary hemostasis indices (bandage test). Features of bleeding duration from the tooth cavity.	Practical works. Situational problem solving, including usage case-method.
Assessment of result of blood typing in AB0 and Rh systems using standard sera and monoclonal antibodies.	Practical works. Situational problem solving, including usage case-method.
Measurement and evaluation of height. Evaluation of endocrine system functions (height as index of endocrine axis hypothalamus-pituitary-liver).	Practical works. Situational problem solving, including usage case-method.
Evaluation of endocrine system functions (comparison of muscle strength of men and women, axis hypothalamus-pituitary-sex glands).	Practical works. Situational problem solving, including usage case-method.
Dynamometry (manual and standing) and physiological evaluation of the results.	Practical works. Situational problem solving, including usage case-method.
Evaluation of dental formula of primary and permanent teeth.	Practical works. Situational problem solving, including usage case-method.
Assessment of extracellular concentration of K ⁺ and Na ⁺ shifts on membrane potential values.	Practical works. Situational problem solving, including usage case-method.
Possibility of pharmacological effect on process of signal transmission in synapses (example of neuro-muscular junction).	Practical works. Situational problem solving, including usage case-method.
Features of innervation of skeletal and smooth muscles and impact of neurotransmitters.	Practical works. Situational problem solving, including usage case-method.
Study of the main tendon reflexes on the example of the knee reflex (morphological basis [reflex arc]). Physiological assessment of the obtained data.	Practical works. Situational problem solving, including usage case-method.
Comparison of mono- and polysynaptic reflexes.	Practical works. Situational problem solving, including usage case-method.
Evaluation of EEG rhythms in different functional states of the CNS.	Practical works. Situational problem solving, including usage case-method.
Assessment of tone and reactivity of sympathetic and parasympathetic parts of ANS by heart rate on the example of clinostatic and orthostatic reflexes. Necessity of knowledge of these reflexes for a dentist.	Practical works. Situational problem solving, including usage case-method.
Properties of arterial pulse and assessment of its rhythmicity and frequency by palpation method.	Practical works. Situational problem solving, including usage case-method.

Measurement of arterial pressure values. Physiological assessment of obtained data.	Practical works. Situational problem solving, including usage case-method.
Mechanism of generation of action potential of typical cardiomyocyte and atypical cardiomyocyte.	Practical works. Situational problem solving, including usage case-method.
Assessment of cardiac cycle duration based on ECG.	Practical works. Situational problem solving, including usage case-method.
Analysis of arterial pressure changes during conduction of orthostatic test.	Practical works. Situational problem solving, including usage case-method.
Spirometry: determination of vital capacity (VC), due vital capacity (dVC), physiological assessment of obtained data. Assessment of spirogram.	Practical works. Situational problem solving, including usage case-method.
Pulseoxymetry conduction and physiologic assessment of hemoglobin oxygen saturation curve. Calculation of oxygen capacity of blood.	Practical works. Situational problem solving, including usage case-method.
Sialometry conduction and physiological assessment of the obtained data.	Practical works. Situational problem solving, including usage case-method.
Assessment of carbohydrate hydrolysis in different states (pH, t).	Practical works. Situational problem solving, including usage case-method.
Assessment of bile impact on fats state.	Practical works. Situational problem solving, including usage case-method.
Measurement of body mass. Calculation of body mass index. Physiological assessment of the obtained data and formulation of scientifically based recommendations for the body weight correction.	Practical works. Situational problem solving, including usage case-method.
Measurement of axial body temperature using liquid and electronic thermometers: analysis of possible errors during performance. Physiological assessment of the obtained data.	Practical works. Situational problem solving, including usage case-method.
Assessment of thermal sensitivity of teeth.	Practical works. Situational problem solving, including usage case-method.
Physiologic assessment of the composition and properties of terminal urine. Common urine analysis.	Practical works. Situational problem solving, including usage case-method.
Assessment of visual system functions (investigation of visual acuity).	Practical works. Situational problem solving, including usage case-method.
Assessment of taste sensitivity thresholds.	Practical works. Situational problem solving, including usage case-method.
Assessment of auditory sensory system functions: experiments of Weber and Rinne.	Practical works. Situational problem solving, including usage case-method.
Assessment of a short-term auditory memory volume using letter and digit complexes in the human.	Practical works. Situational problem solving, including usage case-method.
Assessment of attention indices using a correction test.	Practical works. Situational problem solving, including usage case-method.