

**THEMATIC LESSON PLAN OF LECTURES IN THE DISCIPLINE
"NORMAL PHYSIOLOGY – PHYSIOLOGY OF THE MAXILLOFACIAL
REGION" FOR STUDENTS OF THE EDUCATIONAL PROGRAM
SPECIALIST IN THE SPECIALTY 31.05.03, FOR THE 2023-2024
ACADEMIC YEAR**

№	Topics of lectures	Hours (academic)
1	<p>Physiology of excitable tissues. Physiology of synapses¹ Excitable tissues. General and specific properties of excitable tissues. Biological membranes, their structure and functions. Resting membrane potential. Action potential and its phases. Conditions for occurrence of action potential. Excitability. Changes of excitability during excitation, phases of excitability</p> <p>Synapse, classification of synapses. Electrical synapses: structure and properties. Chemical synapses, structure. Mechanism of signal transmission in chemical excitatory synapses. Physiological properties of chemical synapses²</p>	2
2	<p>Physiology of excitable tissues. Structural and functional organization of muscles¹ Structural and functional organization of muscles. Physical and physiological properties of skeletal muscles. The submicroscopic structure of the myofibril. The concept of sarcomere. Contractile and regulatory proteins²</p>	2
3	<p>Physiology of central nervous system¹ Functional organization of the central nervous system. Neuron as a structural and functional unit of the central nervous system, structure, properties. Classification of neurons. The concept of reflex. Classification of reflexes. Reflex arc as a morphological substrate of the reflex. Reverse afferentation, its role. Nerve center. Anatomical and physiological concept of the nerve center. Properties of nerve centers. Concept of inhibition in the central nervous system, its role in the coordination of reflex activity. Classification of central inhibition. Inhibitory synapses, features of signal transmission in the inhibitory chemical synapse²</p>	2
4	<p>Physiology of autonomic nervous system¹ Autonomic nervous system, its structure and functions. Differences in the organization of the autonomic and somatic nervous systems. Sympathetic division of autonomous nervous system, its structural and functional features (centers, characteristics of fibers and ganglia, mediators, receptors to them, objects of innervation and influence on them). Parasympathetic division of autonomous nervous system, its structural and functional features (centers, characteristics of fibers and ganglia, mediators, receptors to them, objects of innervation and influence on them). Metasympathetic division of autonomic nervous system, its structural and functional features, its role in regulating the activity of internal organs²</p>	2
5	<p>Higher nervous activity¹ Unconditional and conditional reflexes, their comparative characteristics. Conditioned reflexes: types, methods and rules for developing conditioned reflexes in animals and humans. Inhibition of</p>	2

	conditioned reflexes: types and their characteristics. First and second signaling systems in humans, their role. Structure and functional significance of individual regions of the cerebral cortex. Sleep: types of sleep, sleeping patterns, understanding the mechanisms of sleep. Emotions: functions, types, theories, mechanisms of emotions ²	
6	Physiology of sensory systems (part 1) ¹ General principles of analyzers structure. Main functions of the analyzers: detection, signal discrimination, signal conversion, encoding and conducting information, detection and identification of images. Sensory receptors: classification, properties, mechanism of receptor excitation, receptor and generator potentials ²	2
7	Physiology of sensory systems (part 2) ¹ Pain sensory system: receptor, conduction and cortical divisions. Tactile sensory system: receptor, conduction and cortical divisions. Temperature sensory system: receptor, conductor and cortical divisions. Taste sensory system: receptor, conduction and cortical divisions. Olfactory sensory system: receptor, conduction and cortical divisions ²	2
8	Physiology of endocrine system ¹ Concept of endocrine system. Representation of main components of endocrine system (true endocrine glands, mixed secretions, diffuse endocrine system, cells of non-endocrine organs that have endocrine function). Hormones, their role and functions. Classification of hormones. Properties and features of the action of hormones. Pathways and mechanisms of action of hormones on target cells (membrane and intracellular). Hypothalamic-pituitary system and its functions. Pituitary gland and its hormones their role. Role of endocrine glands in development and formation of the maxillofacial region ²	2
9	Physiology of the digestive system (digestion in the oral cavity) ¹ The essence of the digestive process. A functional system that maintains a constant level of nutrients in the blood. Methods of studying the functions of the digestive glands. The essence of the chronic research method created by I.P. Pavlov, its advantages. The role of the oral cavity in the digestive process. Composition and properties of saliva. Schemes of the reflex arc of the unconditional salivation reflex. Adaptive nature of salivation to various food and rejected substances ²	2
10	Physiology of the digestive system (digestion in the stomach) ¹ Digestion in the stomach. Digestion in the duodenum and small intestine. Structure and functions of the pancreas and liver. Digestion in the large intestine. Absorption. Thirst, hunger and satiety ²	2
11	External respiration ¹ Structure and functions of the respiratory tract. Topography, structure and functions of the lungs. Biomechanics of inhalation and exhalation. Pressure in the pleural cavity. Pneumothorax. Vital capacity of the lungs and its components. Effective pulmonary ventilation. Gas exchange in the lungs. Partial pressure and tension of gases in inspired and alveolar air, in the blood of pulmonary capillaries and tissues. Transport of gases by blood. Exchange of gases in tissues ²	2
12	Regulation of breathing ¹	2

	Modern concept about the structure and localization of the respiratory center. Automatism of the respiratory center of the medulla oblongata. Dependence of the activity of the respiratory center on the gas composition of the blood. The role of chemoreceptors in the regulation of respiration. The role of mechanoreceptors in the regulation of breathing. The role of carbon dioxide in the regulation of respiration. The mechanism of the first breath of a newborn. Conditioned reflex regulation of breathing ²	
13	Body fluids¹ Quantity and composition of blood. Plasma and formed elements, their quantity, characteristics and functions. Hemopoiesis. Regulation of hemopoiesis. Leukocyte formula. Phagocytosis. Hemostasis. Blood groups and Rh factor ²	2
14	Physiology of the heart¹ Structure and function of the heart. Physiological properties of the myocardium. Excitability, conductivity, contractility. Conduction system of the heart. The nature of heart automaticity. Gradient of automaticity. Cardiac cycle, its periods and phases. Stroke and cardiac output. Electrocardiography. Extrasystole. Innervation of the heart. The influence of autonomic nerves on the heart activity. Tone of the regulating the heart activity centers. Neural regulation of cardiac activity. Intracardiac and extracardiac regulatory mechanisms. Humoral regulation of cardiac activity ²	2
15	Blood vessels physiology¹ Arterial, venous and lymphatic systems. Functional classification of blood vessels. Basic laws of hydro- and hemodynamics. Blood pressure. Arterial pulse. Microcirculatory bed. Innervation of blood vessels. Vasomotor center. Neural and humoral regulation of vascular tone. Vasoconstrictor and vasodilator substances. Blood depot ²	2
16	Excretion. Kidney physiology¹ Excretory organs. Structure and functions of the kidneys, ureters and bladder. Nephron. Features of blood supply and innervation of the kidneys. The process of urine formation. Glomerular filtration. Clearance. Tubular reabsorption and secretion. Regulation of kidney activity. Amount and composition of urine. The role of the kidneys in the elimination of drugs ²	2
	TOTAL	32

¹ - subject

² - essential content

Considered at the meeting of the department of normal physiology "25" 05 2023,
protocol № 9a

Head of the Department



C.V. Клаучек