

**Topic's plan of lectures
autumn semester 2023-2024**

№	TOPIC	Hours
1.	Introduction to the course of physiology. General principles of biological regulation. Molecular and biological principles of modern physiology. Excitable tissues. Biopotentials.	2
2.	Neural control of physiological functions. Principles of coordination of reflex activity. Excitation and inhibition in CNS.	2
3.	The role of different parts of the CNS in the regulation of motor functions. Investigation of the role of spinal cord, brainstem in regulation of motor activity of human body. The role of the forebrain and cerebellum in regulation of motor activity of human body.	2
4.	General physiology of sensory system. Somatosensory system. Pain and antinociceptive system. Visual and auditory sensory systems.	2
5.	Higher nervous activity. Processes of formation and inhibition of conditioned reflexes. Emotions, motivations, memory.	2
6.	Physiology of the autonomic nervous system in regulation of visceral functions.	2
7.	Physiological bases of humoral regulation of visceral functions. Intracellular signaling. The role of endocrine glands in the regulation of homeostasis, nonspecific adaptation of the organism.	2
8.	Physiology of energy exchange. Thermoregulation.	2
9.	General characteristics of the blood system. Blood as transport systems and the internal environment of the body. Physiological properties of red blood cells. Physiological bases of hemotransfusion.	2
10.	Defence functions of the blood. Vascular-platelet and coagulation hemostasis. Role of anticoagulants, plasmins.	2
<i>TOTAL for III semester</i>		20

Head of the Department



Savytska M.Ya. MD, PhD

Topic's plan of lectures spring semester 2023-2024			<i>Lector</i>
1.	Respiratory system. The main stages of respiration. Gas exchange in the lungs.	2	Savytska M.Ya.
2.	Mechanisms of respiratory regulation. Features of breathing under different conditions.	2	Savytska M.Ya.
3.	Physiology of CVS. Physiological properties of cardiac muscle.	2	Savytska M.Ya.
4.	Pump function of the heart. Control of cardiac activity.	2	Savytska M.Ya.
5.	The role of blood vessels in blood circulation. Hemodynamic's laws. Control of systemic and regional circulation.	2	Savytska M.Ya.
6.	Gastrointestinal Physiology. Digestion in oral cavity. Physiological basis of hunger and satiety. Physiological basis of nutrition.	2	Savytska M.Ya.
7.	Digestive system. Digestion and absorption in the stomach and intestines.	2	Savytska M.Ya.
8.	Renal Physiology. Mechanism of urine formation.	2	Savytska M.Ya.
9.	Role of the kidneys in homeostasis.	2	Savytska M.Ya.
	<i>TOTAL for IV semester</i>	18	Savytska M.Ya.
	TOTAL	38	Savytska M.Ya.

Head of the Department

Savytska M.Ya. MD, PhD

**Topic's plan of practical classes
autumn semester 2023-2024**

№	TOPIC	Hours
1.	Methods of physiological investigations. Investigation of irritability and excitability of nervous and muscular fibres. Life safety: first aid, main rules and approaches.	3
2.	Investigation of conduction of nerve impulses through nerve fibers and neuromuscular synapse. Investigation of AP of nerves and muscles.	3
3.	Investigation of the mechanisms of muscular contraction of skeletal muscles. The characteristics of the smooth muscles. Physiological properties of myokines. Investigation of physical development. Practical skills of physiology of excitable tissues.	3
4.	General characteristics of biological regulation. Investigation of the reflex arc. Investigation of the processes of excitation and inhibition in CNS.	3
5.	Investigation of the role of spinal cord and brain stem in regulation of motor activity of human body.	3
6.	Investigation of the role of forebrain and cerebellum in regulation of motor activity of human body. Regulation of system activities of human body.	3
7.	Investigation of the somatosensory systems. Pain and anti-pain systems.	3
8.	Investigation of the visual and auditory sensory systems.	3
9.	Investigation of the mechanisms of formation of behavior, emotions. Sleep phases.	3
10.	Investigation of the mechanisms of neural control of visceral functions of human body.	3
11.	Practical skills of Physiology of ANS, sensory systems and higher integrative functions.	3
12.	Physiological bases of humoral regulation of visceral functions. Intracellular signaling.	3
13.	Investigation of the role of hormones in the regulation of physical, mental development and reproductive system. Iodine prophylaxis in case of radiation danger.	3
14.	Investigation of the role of hormones in the regulation of homeostasis and the adaptation of the human body to the action of stressors.	3
15.	Investigation of mechanism of energy metabolism and thermoregulation.	3
16.	Practical skills of physiology of endocrine system, energy metabolism and thermoregulation.	3
	<i>TOTAL for III semester</i>	48

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Savytska M.Ya. MD, PhD

Topic's plan of practical classes spring semester 2023-2024		
1.	Blood physiology. Investigation of physical and chemical properties of blood.	3
2.	Investigation of red blood cells count and haemoglobin concentration in the blood. Blood groups and blood-typing methods. Physiological basis of hemotransfusion.	3
3.	Defense functions of blood against foreign influence.	3
4.	Investigation of hemostasis.	3
5.	Practical skills of the Blood Physiology.	3
6.	Respiratory physiology. Investigation of external respiration.	3
7.	Investigation of diffusion and transport of gases in the blood. Regulation of respiration.	3
8.	Practical skills of the Respiratory Physiology.	3
9.	Cardiovascular physiology. Investigation of physiological properties of the cardiac muscle.	3
10.	Investigation of dynamics of cardiac excitation. Recording and analysis of ECG.	3
11.	Investigation of the pumping function of the heart.	3
12.	Regulation of cardiac activity.	3
13.	Investigation of blood pressure. The role of blood vessels in the circulation. Regulation of blood circulation.	3
14.	Practical skills of the Cardiovascular Physiology.	3
15.	Digestion in oral cavity. The role of gustatory and olfactory sensory systems in digestion.	3
16.	Investigation of digestion in the stomach.	3
17.	Investigation of digestion in the duodenum.	3
18.	Investigation of digestion in the small and large intestine. Motility and absorption in the gastrointestinal tract.	3
19.	Investigation of urine formation mechanisms. Non-excretory functions of the kidney.	3
20.	The role of the kidneys in the homeostasis and homeokinesis.	3
21.	Practical skills of the Gastrointestinal and Renal Physiology.	3
	TOTAL for IV semester	63
	TOTAL	111

Head of the Department

Savytska M.Ya. MD, PhD

**Topic's plan of individual work
autumn semester 2023-2024**

№	TOPIC	Hours	Type of control
1.	Preparation for practical classes - theoretical self-training and working on practical skills.	15	Daily supervision on practical classes
2.	History of physiology development in Ukraine. Contribution of works O.O. Bogomolets, R.E. Kavetsky, P.G. Kostyuk in the development of world physiology. Lviv Physiological School. The value of works by A. Bek, L. Popelsky, A. V. Vorobyov, Ye.Ya. Sklyarov, E. M. Panasyuk.	2	
3.	Physiological bases of methods of investigation of excitatory structures (electromyography, EEG, ECG). The value of the study of evoked potentials for the integrative activity of the organism.	4	
4.	Physical activity research methods (pedometry, accelerometer, activity trackers) to assess human health.	4	
5.	Digital technologies for an estimation of bioelectric activity of a brain with loading tests.	4	
6.	Methods of long-term monitoring of video-EEG telemetry.	4	
7.	Vestibular sensory system.	2	
8.	Taste and olfactory sensory systems. Internal (visceral) sensory systems.	4	
9.	Electroencephalogram of natural sleep.	4	
10.	Circadian rhythms and their significance for the integrative activity of the organism. Functional value of melatonin. The concept of circadian rhythmicity of hormonal secretion (Nobel Prize in Physiology or Medicine 2017): “clock genes” – suprachiasmatic nucleus-melatonin, leptin- ghrelin interaction.	4	
11.	Fatigue and adaptation. Investigation of body adaptation to physical activity.	4	
12.	Emotional intelligence and dynamic stereotype of doctor's behavior. Burnout syndrome in medical practice and ways to prevent it.	4	
13.	The value of brown and white adipose tissue for thermoregulation.	4	
14.	The main principles of nutrition in the age aspect. Basics of rational consumption of macro- and micronutrients. The value of micronutrient deficiency to reduce the functional activity of lymphocytes and the formation of long-COVID-19.	4	
15.	Literature analysis and discussion of individual self work.	4	
	TOTAL for III semester	67	

Head of the Department

 **Savytska M.Ya. MD, PhD**

Topic's plan of individual work spring semester 2023-2024			
1.	Preparation for practical classes - theoretical self-training and working on practical skills.	15	Daily supervision on practical classes
2.	Hybrid immunity, clinical significance for counteracting SARS-CoV2.	4	
3.	Investigation and functional significance of hemostasis indexes. Influence of physiological factors on hemostasis.	4	
4.	Physiological significance of reactive blood changes in different functional states of the blood.	4	
5.	Sensors and systems that control the physiological activity of the human respiratory system. Physiological bases of modern respiratory tests.	4	
6.	Features of regional blood circulation and its regulation.	2	
7.	Dynamics and mechanisms of lymphatic flow control.	2	
8.	Modern diagnostic methods for assessing the functioning of the heart and the state of vessels. Physiological principles of ultrasound imaging of the heart (one-, threedimensional echocardiography, ultrasound of the heart, arteries, veins)	4	
9.	Modern methods of diagnosing the individual state of the cardiovascular system (functional studies: dosed load test, Harvard step test, Navakki test, bicycle ergometry, treadmill test, Holter ECG monitoring; medical gadgets).	4	
10.	Intelligent systems (IS) of the main vital signs.	4	
11.	Investigation of the functional state of the liver in terms of metabolism of proteins, fats and carbohydrates and modern instrumental methods (ultrasound, electrography).	4	
12.	Modern methods of the diagnostics of digestive system.	4	
13.	Regulation of water-electrolyte balance by kidneys.	4	
14.	Significance of metabolite content and enzyme activity to assess renal function.	4	
15.	Literature analysis and discussion of individual self work.	3	
16.	Preparation for the final control.	18	
TOTAL for IV semester		84	
TOTAL		151	Exam

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