



**MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
Faculty for foreign citizens' education
Department of Normal and Pathological Physiology**

HUMAN PHYSIOLOGY AND ANATOMY

**WORK PROGRAM
of educational component**

**training for the second (Master's) level of higher education
in speciality 226 – Pharmacy, Industrial pharmacy
field of knowledge 22 –Healthcare
of educational program «Pharmacy»
in specialization(s) 226.01. Pharmacy**

2023 year

The work program in educational component «Human Physiology and Anatomy» speciality 226 – Pharmacy, Industrial pharmacy of educational program «Pharmacy» in specialization(s) 226.01. Pharmacy for applicants for higher education 1 year of study.

EDUCATIONAL COURSE TEAM:

Kononenko Alevtyna, candidate of pharmaceutical science, associate of professor

The work program has been considered and developed at the Meeting of the Department of Normal and Pathological Physiology

Examination record from «31» of august 2023 year № 1

Department chairman, prof.



Nadiia KONONENKO

The work program has been approved at the Meeting of Methodical Commission in Biomedical Sciences

Examination record from «01» of september 2023 year № 1

Head of Subject Oriented Educational Program



Nadiia KONONENKO

1. Description of the educational component

Language of instructions: English

Educational component status: compulsory

Prerequisites for studying the educational component: "Normal Physiology" as a basic educational component, focused on the preparation of highly qualified masters-pharmacists and is one of the most important subjects in the system of medical and pharmaceutical education. The program of studying the educational component "Normal Physiology" for higher pharmaceutical schools and pharmaceutical faculties of higher medical schools of III-IV levels of accreditation compiled in accordance with the following normative documents. It provides training for masters-pharmacists owning a significant amount of theoretical and practical knowledge regarding the structural and functional characteristics of the different levels of its organization. The training course based on a study of students of medical biology, Latin, Medical and Biological Physics, and lays the foundation study of biochemistry, pathology, pharmacology, pharmacotherapy, clinical pharmacy, laboratory diagnosis that involves the formation of abilities to apply knowledge of anatomy and physiology in further education and professional activities, laying the foundations of a healthy lifestyle.

The subject of the study educational component "Normal Physiology" is the structural and functional features of the structure, origin, development and operation of the laws of the human body at different levels of its organization and its regulation.

Information content of educational component. 5,0 ECTS credits 150 hours are assigned for study of the educational component.

2. Objectives and tasks of the educational component

The purpose of teaching goal of the educational component "Normal Physiology" is gaining each student knowledge of anatomy and physiology in the world of ideas about the structure and function of different cells, woven, organs and systems as a whole in order to use the knowledge gained in the study of these medical - biological subjects and in their future careers. Lay understanding of the concept of health, healthy lifestyles and prevent disruption of the process of life.

The main tasks of educational component "Normal Physiology" is a systematic approach to the description of the structure of the body in the unity with performed functions; studying of the sense of physiological processes, the functions of individual organs, systems and whole organism; the study of the nervous and endocrine regulation of the body, its organs and systems; reveal the physiological mechanisms of interaction of organs and systems; form students practical skills and determine the functional characteristics of the organism; increase understanding of the importance of human anatomy and physiology for other medico – biological educational components.

3. Competency and planned Educational Outcome

The educational componentt "Normal Physiology" provides the following **competency** to a Candidate:

integral:

ability to solve complex specialized problems and practical problems in professional activities or in the learning process, which involves the application of certain theories and methods of relevant science and is characterized by complexity and uncertainty of conditions;

general:

GC 02. Knowledge and understanding of the subject area; understanding of professional activity.

GC 11. Ability to apply knowledge in practical situations, make informed decisions.

special (professional, subject):

PC 5. The ability to carry out sanitary and educational work among the population for the purpose of prevention of common diseases, prevention of dangerous infectious, viral and parasitic diseases, as well as for the purpose of promoting timely detection and support of adherence to the treatment of these diseases according to their medical and biological characteristics and microbiological features

Integrative final *program learning outcomes (PLO)*, the formation of which is facilitated by the educational component "Normal Physiology"

PLO 1. To have and apply specialized conceptual knowledge in the field of pharmacy and related fields, taking into account modern scientific achievements.

PLO 3. To have specialized knowledge and skills/skills for solving professional problems and tasks, including for the purpose of further development of knowledge and procedures in the field of pharmacy.

PLO 8. Formulate, argue, clearly and concretely convey to specialists and non-specialists information based on one's own knowledge and professional experience, the main trends in the development of world pharmacy and related industries.

As a result of learning activities a Candidate has to

know:

- object, the purpose of his study, objectives and values for future practice;
- functional anatomy and physiology of the human body
- general questions physiology of excitable tissues;
- general questions physiology of the musculoskeletal system;
- mechanism of functioning of various organs and systems neurohumoral regulation;
- changes of organs and systems in terms of various factors of the environment;
- integrative mechanism of the body.

be able:

- do opinion on the regulation and function of organs and systems;
- draw conclusions about the mechanisms of neural and humoral regulation of physiological functions of the body and its systems;
- analyze the state of sensory processes to ensure human life;
- explain the physiological basis of methods of investigation functions;
- explain integrative mechanism of the body;
- interpret patterns and mechanisms of functioning of excitable structures;
- use knowledge about the mechanisms of physiological functions to improve the quality of their own life and finding ways to preserve health, increase efficiency;
- interpret experimental results.

acquire:

- methods for research functions of organs and systems;
- modern information technologies.

4. The educational component structure

Thematic Modules and Topics	Hours				
	Фс(4.10д)engl				
	total	including			
lect.		sem.	pract.	ind. work	
CONTENT MODULE 1. Nervous regulation of visceral functions. Higher nervous activity. Sensor systems.					
Topic 1. Introduction to the course of Physiology. Excitable tissues	9	1	-	4	4
Topic 2. Physiology of nerve fibers. Synapses. Physiology of muscle fibers.	10	1	-	4	5
Topic 3. Nervous System. Properties of nerve centers. Spinal cord. Functions. Spinal cord reflexes.	10	1	-	4	5
Topic 4. Brain. Functions of brain departments	9	1	-	4	4
Topic 5. The autonomic nervous system. Sympathetic, parasympathetic and metasymphathetic departments of the ANS. Regulatory functions.	9	1	-	4	4
Topic 6. Higher nervous activity. Physiological bases of behavior. Conditional and unconditional reflexes. Memory physiology. Sleep physiology. Types of human HNA. <i>Content</i>	11	1	-	4	6

<i>cmodule control 1.</i>					
Total under Module 1	58	6	-	24	28
CONTENT MODULE 2. Humoral regulation of visceral functions. The circulatory system.					
Topic 7 Hormones of central glands of internal secretion. Regulatory Function Hormone peripheral glands. Regulatory function.	10	1	-	4	5
Topic 8 Composition, physico-chemical properties of blood Blood cells, value. Blood clotting. Anti-Blood clotting system.	11	2	-	4	5
Topic 9 Cardiovascular system. Functions. Regulation of cardiovascular activity. Cardiac cycle. External manifestations of the heart. Heart tones. ECG.	9	1	-	4	4
Topic 10 Hemodynamics. Functional types of vessels. Blood pressure. Arterial pulse. <i>Thematic cmodule control 2.</i>	9	1	-	4	4
Total under Module 2	39	5	-	16	18
CONTENT MODULE 3. Anatomy and physiology of visceral systems.					
Topic 11 Respiratory system. Stages of breathing. Respiratory regulation.	7	1	-	2	4
Topic 12 The digestive system. Functions. Digestion in the oral cavity. Digestion in the stomach and intestines. Absorption. Digestion regulation.	14	2	-	6	6
Topic 13 Excretory system. Nephron is a structural and functional unit of the kidneys. Functions of the kidneys. Regulation of excretion.	9	1	-	4	4
Topic 14 Metabolism and energy. Thermoregulation. <i>Thematic cmodule control 3.</i>	9	1	-	4	4
Total under Module 3	39	5	-	16	18
Semester module supervision	14	-	-	4	10
Total Hours	150	16	-	60	74

5. Contents of the educational component

Thematic module 1. Nervous regulation of visceral functions. Higher nervous activity. Sensor systems.

Topic 1. Introduction to the course of Physiology. Physiology of excitement. Membrane potential, action potential.

Normal anatomy and physiology – the study of the structure and mechanisms of life healthy person. Regulation functions. Levels of regulation functions. Mechanisms of regulation: nervous, humoral, self-regulation. Value of physiology in training pharmacist.

Irritability, excitability. The excitation and inhibition as the active state of tissues. The membrane potential of its origin. Local response. The level of critical depolarization. Depolarization threshold as a measure of excitability. Action potential, its phases and origin. Changes in the excitability of excitement. Options excitability. Periods of relative and absolute refractory, mechanisms of their origin, the physiological significance.

Ways of regulation of the functional state excitable structures by drugs

Topic 2. The structure and physiology of nerve fibers. The structure and function of the synapse. Structure and physiology of muscles. The structure of the nerve fibers. Physiological properties of nerve fibers. The mechanisms of nerve impulse myelin and nerve fibers bezmyelinovymy. Patterns of excitement.

Synapse, structure, functions. The mechanisms of chemical transmission of excitation through the synapse.

Physiology of muscles. Mechanisms of contraction and relaxation of skeletal muscles. Mechanisms combination of excitation and contraction in the muscle fibers.

The functions and properties of skeletal muscle. Types of muscle contraction depending on the frequency of stimulation: single, tetanichni. Types of muscle contraction depending on changes in their

length and tension, isometric and isotonic. Structural and functional features neopsmuhovanyh muscles. Ways of pharmacological regulation of muscle functional state.

Topic 3. Nervous System. Properties of nerve centers. Spinal cord. Functions. Spinal cord reflexes. Functions and general principles of the structure of the nervous system. Neuron - structural and functional unit of the central nervous system. Reflex activity of the central nervous system. Reflex. The reflex arc. The receptor, classification, basic properties. The concept of receptive field and reflex zones. Patterns of excitation in the CNS. The concept of the nerve center. General properties of the nerve centers. General principles of coordination functions. Inhibition of the CNS - active process, a form of nervous system response to stimulation. Types of inhibition. Mechanisms of development. Reflex activity and conduction spinal cord.

Topic 4. Brain. Functions of brain departments. Brain stem (medulla oblongata and cities). Structure. Reflex activity. Conduction function of the medulla oblongata and the bridge. The average brain. Structure. The functions of the primary auditory and visual centers. Midbrain role in the regulation of posture, body movements and muscle tone. Cerebellum. Structure. Afferent and efferent connections of cerebellum. The functions of the cerebellum. Participation in the regulation of autonomic functions. Interim brain. Structure. Thalamus. Specific and nonspecific nuclei of the thalamus. The hypothalamus - the highest subcortical vegetative center. Characteristics of the kernels. Reticular formation of the brain. Features neural structure, properties of neurons. Support tone all parts of the CNS. Basal nucleus. Role in the formation of muscle tone and complex motor acts in the organization and implementation of motor programs. The functions of the striatum, its interaction with the white ball. Limbic sysTopic. Storage. Role in the emergence of emotions, sexual sensations in learning and memory.

Topic 5. The autonomic nervous system. Sympathetic, parasympathetic and metasympathetic departments of the ANS. Regulatory functions. Structural and functional properties of autonomous systems. Sympathetic, parasympathetic and metasympatychna of the autonomic nervous system. Vegetative components and their functions. Mediators. The main types of receptive substances (adrenergic, cholinergic, etc.). The functional significance of the autonomic nervous system.

Topic 6. Higher nervous activity. Physiological bases of behavior. Conditional and unconditional reflexes. Memory physiology. Sleep physiology. Types of human HNA. The cortex of the cerebral hemispheres. Organization of neurons of the cortex. The functional organization of the cerebral cortex of the brain. Sensitive areas. Motor zones. Non-specific areas. Conditioned reflex as a form of adaptation to changing conditions of existence. Classification of conditioned reflexes. The formation of conditioned reflexes. The mechanism of formation of a conditioned reflex. Inhibition of conditioned reflexes. Types of higher nervous activity. Characteristics of the nervous processes of excitation and inhibition. Features of higher nervous activity. Signal system. Special types of GNI person. Sleep. Mechanisms of sleep. Memory types and mechanisms.

Thematic module 2. Humoral regulation of visceral functions. The circulatory system.

Topic 7. Hormones of central glands of internal secretion. Regulatory Function Hormone peripheral glands. Regulatory function. Structural and functional organization of the endocrine system. Endocrine glands and endocrine cells, hormones and their importance. The main mechanisms of action of hormones. The membrane and intracellular receptors, second messenger (cAMP, cGMP, Ca²⁺, NO et al.) and their role. Regulation of hormone secretion. Hypothalamic-pituitary sysTopic. The functional relationship with the hypothalamus pituitary. Neurosecretion hypothalamus. Role liberyniv and statins.

Pituitary. Adenohypophysis hormones, neurohypophysis and intermediate fate. Pineal gland and its hormones. Thyroid gland and parathyroid glands and their hormones. The effect on the morphology and function of organs. The adrenal gland. The hormones of the adrenal glands. Hormones of adrenal medulla. Endocrine pancreatic function, its role in the regulation of carbohydrate, fat and protein metabolism. Sex glands. The role of sex hormones in regulating metabolism. The concept of tissue hormones.

Topic 8. The physiology of blood system. The concept of the blood system. The main functions of blood. The composition and volume of blood in humans. Hematocrit rate. The main physiological constants blood, mechanisms of their regulation.

Plasma, its composition, role of plasma proteins. Osmotic and oncotic pressures. Regulation sustainability osmotic pressure. Acid-base status blood buffer systems role in the regulation of sustainability.

Red blood cells, the structure, the number of functions. Hemoglobin, its structure, properties and types of compounds. Number of hemoglobin. Hemolysis, its types. Erythrocyte sedimentation rate (ESR),

the factors that affect it.

White blood cells, the number, types. Orthocytosis. The functions of different types of leukocytes. Regulation of leukocytes. The concept of immunity, its types.

Platelets, their number, functions, properties

Blood groups: AB0 system, SDE others. Methods for determining blood groups. Physiological basis of blood transfusion. Blood substitutes.

Hemostasis, its types. Vessel-platelet hemostasis his role. Coagulation hemostasis, its phases, mechanisms mentioned. The modern idea of the main factors involved in coagulation hemostasis. Fibrinolysis, mechanisms of its value.

Mechanisms maintaining the liquid state of blood.

Topic 9. Cardiovascular system. Functions. Regulation of cardiovascular activity. The structure of the heart and its function. Cardiac muscle, its structure, function physiological properties of the myocardium and their features. Automatism heart. Leading sysTopic its functional features, speed of excitation structures of the heart. Typical action potential of cardiomyocytes. Refractory period. Mechanisms of contraction and relaxation of cardiomyocytes.

Cardiac cycle and its phase structure. Blood pressure in the cavities of the heart. The structure and operation of the valve apparatus. The systolic and minute volume of blood. Appearance heart.

Regulation of cardiac activity, myogenic, neural, humoral. Dependence of the heartbeat of the length of cardiomyocytes (heart law Frank - Starling). The mechanism of influence of parasympathetic and sympathetic nerves in the physiological properties of cardiac muscle. Mechanisms of influence of the ion plasma on heart activity. Mechanisms of influence of hormones on heart activity, catecholamines, thyroxine and triiodothyronine, glucagon and other.

Topic 10. Hemodynamics. Regulation of blood circulation. Big and small circulation. The structure of the blood vessels. Functional classification of vessels. The basic principles of hemodynamics. Vascular tone. The speed of circulation. Blood pressure, the type (systolic, diastolic, pulse). Methods of measuring blood pressure. Arterial pulse and its parameters. The movement of blood through the veins. Features. Microvasculature. Regulation of circulation.

Topic 11. The function of the respiratory system. Regulation of breath. The structure of the respiratory system. Povitryanosni ways, structural features, functions. The structure of the lungs. Acinus - structural and functional unit of the lungs. The main stages of breath. External breathing. Inhale and exhale. Surfactant and its properties. Lung volumes. Gas exchange in the lungs. The partial pressure of gases. Gas exchange in tissues. Regulation of breath. The respiratory center. Central and peripheral chemoreceptors. Receptors and pulmonary tracts.

Thematic module 3. Physiology of visceral systems.

Topic 12. The function of the digestive system. Regulation of digestion. The structure and function of the digestive system. Alimentary canal and digestive glands. The main functions of digestion, secretion, motility, absorption. Digestion: its types (cavity, diaphragm, intracellular) main stages. Digestion in the mouth. Mechanical and chemical processing of food. Salivation. The number, composition and properties of saliva, its importance in digestion, secretion. Regulation of secretion of saliva. Swallowing his Phase regulation. Secretory activity of gastric glands. The composition and properties of gastric juice. Mechanisms of secretion of hydrochloric acid, enzymes, mucus and their regulation. Nervous and humoral regulation of gastric glands, regulation of secretion phase: tsefalichna, gastric, intestinal stomach. Motor function, its regulation.

Foreign-secretory activity of the pancreas. The number, composition and properties of pancreatic juice and its role in digestion. Phase regulation of secretion: tsefalichna, gastric, intestinal.

The role of the liver in digestion. The formation of bile, its composition and properties. Liver and gallbladder bile. Participation of bile in digestion. The regulation of bile formation and allocation of the duodenum. Intestinal secretion, composition and properties of intestinal juice, its role in digestion. Porous membrane hydrolysis and nutrients. Motor activity of the small intestine, its role in digestion. Types of motor, its regulation. Digestion in the colon. The role of gut microflora. The processes of absorption. The absorption of substances in different parts of the alimentary canal, its mechanisms.

Topic 13. The functions of the excretion. Regulation of the excretion. Characteristics of the excretion (kidneys, lungs, skin, digestive organs). Kidney as the main organs of the excretory system. The functions of the kidneys. Morphofunctional characteristic kidney. Nephron as a structural and functional unit of the kidney. Circulation in the kidney and its features. Urine formation: glomerular filtration,

tubular reabsorption, tubular secretion. The mechanism of glomerular filtration. Primary urine, its composition. Mechanisms reabsorption. Tilt-protypotochnyy mechanism. Secretory processes in the tubules. The composition of urine. The regulation of urine formation.

Topic 14. Metabolism and energy. Thermoregulation. The biological significance of metabolism and energy. The main exchange. The need for proteins, fats, carbohydrates, minerals and vitamins. Physiological basis of nutrition. Share proteins. Nitrogen balance. The regulation of protein metabolism. Carbohydrate metabolism and its regulation. Exchange of fat. Regulation of zhyroutvorenniya. Sharing water. Share minerals. The main exchange. Methods of measurement.

Constancy of the temperature of the internal environment as a necessary condition for the normal state of metabolic processes. Poikilothermia, homeothermia. The temperature of the human body, its daily fluctuations. The temperature of various parts of the skin and internal organs of man. Physical and chemical thermoregulation. Metabolism as a source of heat generation. The role of individual organs in heat production. Heat transfer. Methods for the release of heat from the surface of the body (radiation, conduction, convection, evaporation). Physiological mechanisms of heat transfer (movement of blood in the vessels of the skin, sweating and others). The center of thermoregulation. Peripheral and central thermoreceptors. Nervous and humoral mechanisms of thermoregulation. Regulation of body temperature with changes in ambient temperature.

Semester module supervision

6. Lecture Topics

No.	Topic	Hours
		Φ (4.10)engl
1	Excitable tissue	1
2	Physiology of nerve fibers. Synapses. Physiology of muscle fibers.	1
3	Nervous System. Properties of nerve centers. Spinal cord. Functions. Spinal cord reflexes.	1
4	Brain. Functions of individual departments	1
5	Autonomic nervous system	1
6	The higher nervous activity. Physiological bases of behavior. Conditional and unconditional reflexes. Memory physiology. Sleep physiology.	1
7	Functions of the endocrine system. Central glands hormones. Peripheral glands hormones. Regulatory function	1
8	Blood composition and physiology. Blood clotting. Anticoagulant system.	2
9	Cardiovascular system. Functions. The conduction system of the heart. Regulation of cardiac activity	1
10	Hemodynamics. Regulation of blood circulation.	1
11	Respiratory functions. Respiratory regulation	1
12	Digestive system, functions. Digestion regulation.	2
13	Excretory system, functions. Regulation of excretion.	1
14	Metabolism and energy. Thermoregulation	1
Total hours		16

7. Topics of seminars

Seminars on the educational component "Normal Physiology" are not provided for in the work plan.

8. Practical Classes Topics

№ з/п	Topic	Hours
		Φ (5.0)engl
1	Excitable tissue	4
2	Physiology of nerve fibers. Synapses. Physiology of muscle fibers.	4
3	Nervous System. Properties of nerve centers. Spinal cord. Functions. Spinal cord reflexes.	4

4	Brain. Functions of individual departments	4
5	Autonomic nervous system	4
6	The higher nervous activity. Physiological bases of behavior. Conditional and unconditional reflexes. Memory physiology. Sleep physiology.	4
7	Functions of the endocrine system. Central glands hormones. Peripheral glands hormones. Regulatory function	4
8	Blood composition and physiology. Blood clotting. Anticoagulant system.	4
9	Cardiovascular system. Functions. The conduction system of the heart. Regulation of cardiac activity	4
10	Hemodynamics. Regulation of blood circulation.	4
11	Respiratory functions. Respiratory regulation	4
12	Digestive system, functions. Digestion regulation.	6
13	Excretory system, functions. Regulation of excretion.	4
14	Metabolism and energy. Thermoregulation	4
	Semester module supervision	4
Total hours		60

9. Topics of laboratory classes

Laboratory classes in the educational component "Normal Physiology" are not provided by the work plan.

10. Individual Work

№ 3/II	Topic	The amount in hours
		Φ (5.0)
1	Excitable tissue	4
2	Physiology of nerve fibers. Synapses. Physiology of muscle fibers.	5
3	Nervous System. Properties of nerve centers. Spinal cord. Functions. Spinal cord reflexes.	5
4	Brain. Functions of individual departments	4
5	Autonomic nervous system	4
6	The higher nervous activity. Physiological bases of behavior. Conditional and unconditional reflexes. Memory physiology. Sleep physiology.	6
7	Functions of the endocrine system. Central glands hormones. Peripheral glands hormones. Regulatory function	5
8	Blood composition and physiology. Blood clotting. Anticoagulant system.	5
9	Cardiovascular system. Functions. The conduction system of the heart. Regulation of cardiac activity	4
10	Hemodynamics. Regulation of blood circulation.	4
11	Respiratory functions. Respiratory regulation	4
12	Digestive system, functions. Digestion regulation.	6
13	Excretory system, functions. Regulation of excretion.	4
14	Metabolism and energy. Thermoregulation	4
	Semester module supervision	10
Total hours		74

Students' Individual Work Tasks

1. Analysis of literature and discussion on the topic: Anatomy of the musculoskeletal system.
2. Analysis of literature and discussion on the subject: Physiology of sleep, its form and phase.
3. Analysis of literature and discussion on the topic: Modern theories of sleep development and its frustration.
4. Analysis of literature and discussion on the topic: The physiological basis for stopping bleeding with medication.

5. Analysis of literature and discussion on the topic: Depot of blood, physiological significance.
6. The main stages of development and development of physiology, as the scientific basis of medicine.
7. Contribution of Ukrainian physiologists to the development of world physiology.
8. Features of regional blood circulation. Physiological features of lymphatic circulation.
9. Physiological basis of hunger and satiety.
10. Active rest and its mechanisms. Physiological basis of sport.
11. Physiological basis of human labor activity.
12. Physiology of pain.

11. Criteria and procedure for evaluating learning outcomes

The results of semester control in the form of semester differentiated credit are evaluated on a 100-point, differentiated scale ("excellent", "good", "satisfactory", "unsatisfactory") and on the ESTS scale.

Types of assessment	Scores
Module 1	
Content module 1 1. Evaluation of topics 1-7: work in classes (oral survey, writing test tasks, solving situational problems). 1. 2. Control of content module 1: theoretical questions and preparation of test tasks.	30-50
Content module 2 1. Evaluation of topics 8-12: work in classes (oral survey, writing test tasks, solving situational problems). 1. 2. Control of content module 1: theoretical questions and preparation of test tasks.	24-40
Content module 3 1. Evaluation of topics 13-16: work in classes (oral survey, writing test tasks, solving situational problems). 1. 2. Control of content module 1: theoretical questions and preparation of test tasks.	21-35
Semester control from module 1 (CM1+CM 2+CM3)/1.25	60-100

The independent work of students of higher education is evaluated during the current control and control of content modules.

Evaluation of the success of a higher education student in each of the planned types of work in classes and during supervision is carried out according to the following criteria:

Types of work for which the applicant receives	The maximum number of points for the type of	Evaluation criteria
work in classes (1-7) of content module 1 (min-30- max 50) work in classes (8-12) of content module 2 (min-24- max 40) work in classes (13-16) of content module 3 (min-21- max 35)		
orally examination	2 points	2.0 points - the student of higher education gives comprehensive answers to the teacher's theoretical questions; shows comprehensive and deep knowledge of the theoretical material, demonstrates knowledge of additional literature on the subject of the class; thinks logically and constructs an answer.
		11.5 points - the student of higher education has mastered the theoretical material well, but certain inaccuracies and errors in the logic of the presentation of the theoretical content are assumed, which he eliminated with the help of the teacher.

		<p>1.0 points - the student of higher education has basically mastered the theoretical knowledge of the educational component, but answers unconvincingly, additional questions cause uncertainty.</p> <p>0.5 points - the student of higher education has a low level of theoretical knowledge, confuses concepts, additional questions indicate a lack of stable knowledge.</p> <p>0 points - the student of higher education has not mastered the educational material of the educational component, does not know scientific facts, definitions, almost does not orient himself in primary sources and recommended literature.</p>
compilation of test tasks	1 point	The student of higher education gave correct answers to 80-100% of the test tasks
Solving a situational problem, acquisition of practical skills	2 points	<p>2.0 points - the student of higher education demonstrates a high level of assimilation of practical skills; makes a detailed analysis and provides correct answers to situational problems on the topic.</p> <p>1.5 points - the student of higher education has mastered practical skills, but certain inaccuracies and errors are assumed when analyzing the situational problem</p> <p>1.0 points - the student of higher education does not accurately answer questions of a practical nature; when performing a situational task, provides answers to 50% of the questions.</p> <p>0.5 points - the student of higher education has not mastered practical skills; when performing a situational task, provides answers to 40% of questions, is unable to justify the answer based on the given data.</p> <p>0 points - practical skills are not formed; the student of higher education does not provide answers to the questions of the situational problem.</p>
Control of content module 1, 2, 3 (min-6- max 10)		
Oral examination or written work	10 points	<p>2.5 points for one question</p> <p>2.5 points - the student of higher education gives comprehensive answers to the teacher's theoretical questions; shows comprehensive and deep knowledge of the theoretical material, demonstrates knowledge of additional literature on the subject of the class; thinks logically and constructs an answer.</p> <p>2.0 points - the student of higher education has mastered the theoretical material well, but certain inaccuracies in the logic of the presentation of the theoretical content are assumed.</p> <p>1.5 points - the student of higher education satisfactorily mastered the theoretical material, but mistakes are made in the logic of the presentation of the theoretical content.</p> <p>1.0 points - the student of higher education has basically mastered the theoretical knowledge of the educational component, but answers unconvincingly, additional questions cause uncertainty.</p> <p>0.5 points - the student of higher education has a low level of theoretical knowledge, confuses concepts, additional questions indicate a lack of stable knowledge.</p> <p>0 points - the student of higher education has not mastered the educational material of the educational component, does not know scientific facts, definitions, almost does not orient himself in primary sources and recommended literature.</p>

Scheme of accrual and distribution of points

Current testing and independent work								
Module 1								
Content module 1								
T1	T2	T3	T4	T5	T6	T7	CMS1	
3-5	3-5	3-5	3-5	3-5	3-5	3-5	6-10	30-50
Content module 2								
T8	T9	T10	T11	T12	CMS2			
3-5	6-10	3-5	3-5	3-5	6-10			24-40
Content module 3								
T13	T14	T15	T16	CMS3				
6-10	3-5	3-5	3-5	6-10			21-35	

Based on the results of studying the topics of the educational component, a general assessment is formed based on the sum of the current rating. A student of higher education is assessed according to the following knowledge assessment scale:

The sum of points for all types of educational activities	Grade ECTS	Evaluation on a national scale	
		mark	credit
90-100	A	excellent	is credited
82-89	B	good	
74-81	C		
64-73	D		
60-63	E	satisfactorily	
35-59	FX	unsatisfactory with the possibility of reassembly	isn't credited
0-34	F	unsatisfactory with mandatory re-study of the discipline	

12. The form of semester supervision of study progress:

Semester control is conducted in the form of a semester credit

13. Methodological Support

- Educational learning material on educational component
- Work program on educational component
- Presentations of lectures
- Lecture notes
- Workbook on "Normal Physiology"
- Demonstration tables
- Visual materials: models, microscopic preparations
- Test tasks to control each topic
- Computer testing programs
- Training films
- Ticket sets in CTM, and CT

14. Reading suggestions

The main reading suggestions:

1. Synopsis of lectures in Physiology and Human Anatomy: Training aids / L. N. Maloshtan, Ye. K. Ryadnyh, G/ P. Zhegunova et al.; Edited by the head of the Physiology Department Life Sciences Maloshtan L. N. – Kharkiv: PH of NUPh, 2007. – 128 p.
2. Learning manual of human Normal Physiology for practical study / L. M. Maloshtan, V. A. Volkovoy, O. V. Dolzhykova et al. – Kharkiv: NUPh: Golden pages, 2011. – 216 p.
3. Work book in Human Anatomy and Physiology / L. M. Maloshtan, A.G. Kononenko, O. V. Dolzhykova et al. – Kharkiv: NUPh, 2011. – 120 p.

Supplementary reading suggestions:

1. Eder. Laboratory Atlas of Anatomy and Physiology, Fourth Edition / Eder, Kaminsky, Bertram; The McGraw-Hill Companies, 2003. – 192 p.
2. Widmaier Eric P. Strang. Human Physiology: The Mechanisms of Body Function: 9th Edition / Eric P. Widmaier, Hershel Raff, Kevin T.; The McGraw-Hill Companies, 2003. – 826 p.
3. Mader Sylvia S. Understanding Human Anatomy & Physiology, Fifth Edition / Mader Sylvia S.; The McGraw-Hill Companies, 2004. – 458 p.

15. Information Resources, including the Internet

1. <http://pharmel.kharkiv.edu/moodle/course/index.php?categoryid=63> – Center for Distance Technologies
2. <http://www.josejoserestaurant.com/anatomy-and-physiology-lab-manual-exercise-36.pdf>
3. <http://www.sixt-martinique.com/anatomy-and-physiology-lab-manual-exercise-36.pdf>