MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY

Department of anatomy, normal and pathological animal physiology

"Approved"
Head of Department
D.vet.s. Professor
_____ 2020
_____ (Kambur M.D.)

WORKING PROGRAM OF EDUCATIONAL DISCIPLINE (SYLLABUS)

PP. 05 Pathological Physiology
(Code number and name of the educational discipline)

Short course

Specialty 211 "Veterinary Medicine"

Educational program: EWP "Veterinary medicine"

Faculty of Veterinary Medicine

2020 - 2021 academic year

Work program with the subject "Pathological physiology" for students with the direction of preparation **Specialty 211 "Veterinary Medicine"**

Developers: **Kovalenko L.M. k.vet.s., PhD, Professor** (_____)

The work program considered at a meeting of the department of anatomy, normal and pathological animal physiology.

The protocol from "_25_" of May 2020 № __17_

Head of the department of anatomy, normal and pathological animal physiology d.vet.s., Professor_____ (Kambur M.D.)

Approved:
Guarantor of educational program _____(L.G.Ulco)

Dean _____ (O.L. Nechiporenko)
to which the department

Methodologist of the department
of quality of education,licensing and accreditation_____

Registered in the electronic database, date: 03.07. 2020

1. Description of the discipline

<table>
<tr><td rowspan="2">Indices industry knowledge,</td><td rowspan="2">direction, training, education qualification level of discipline Feature</td><td colspan="2">qualification level of discipline Feature</td></tr>
<tr><td>full-time education</td><td>full-time education</td></tr>
<tr><td>The number of credits - 4</td><td>Area of expertise:
21 "Veterinary Medicine"</td><td colspan="2">Normative</td></tr>
<tr><td>Module - 6</td><td rowspan="6">Specialty 211 -"Veterinary Medicine"</td><td colspan="2">Year of training:</td></tr>
<tr><td>Content module 12</td><td>2020</td><td>2021 y</td></tr>
<tr><td></td><td colspan="2">Course</td></tr>
<tr><td></td><td>2</td><td>3</td></tr>
<tr><td></td><td colspan="2">Semester</td></tr>
<tr><td>Total hours - 120</td><td>4th</td><td>5th</td></tr>
<tr><td rowspan="11">Weekly hours for full-time education:
classroom - 2
Self robots student - 1</td><td rowspan="11">Educational qualification:
“Master”</td><td colspan="2">Lectures</td></tr>
<tr><td>14 hours.</td><td>16</td></tr>
<tr><td colspan="2">Practical, seminar</td></tr>
<tr><td>-</td><td>-</td></tr>
<tr><td colspan="2">Laboratory</td></tr>
<tr><td>16 hours.</td><td>14 hours.</td></tr>
<tr><td colspan="2">Independent work</td></tr>
<tr><td>30 hours</td><td>30 hours</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2">Type of control: set-off copies</td></tr>
</table>

Note. The ratio of the number of class hours for independent and individual work is as follows:
for full-time education - 50.0 / 50.0 (30/30)

The purpose and objectives of discipline

Purpose:

The purpose of discipline "Pathological physiology" is the formation of deep theoretical knowledge for the study of general and specific laws governing the formation of the pathological process, pathological condition of the body; practical skills in laboratory techniques for modeling of pathological effects in laboratory animals.

Objective:

The main objectives of the discipline "Pathological physiology" is

♦ formation of students' medical theoretical thinking based on knowledge of the laws of dialectics, of determinism, for their application in the study of clinical disciplines;

♦ training skills experimentally verify the facts;

♦ training of certain practices, and develop skills in the clinical laboratory.

A study of the discipline a student must:

know:

• definition of etiology, pathogenesis; the importance of the role of heredity, constitution and age pathology, development of pathological reactions;

• classification of the reactivity of the organism and the value of its determination in the development process of a stalemate, the definition of phagocytosis and the associated development of immunological reactivity, development of pathological processes of cells, impaired local blood circulation and microcirculation;

• pathological processes in the tissues; classification of tissue pathology, tumor growth and development the differential diagnosis of benign and malignant tumors, the overall metabolic - carbohydrate, lipid, ground, mineral, fasting types of classification and definition;

• changes in the organs and circulatory system unlike vascular and heart failure clinical signs of the main factors causing disturbances in blood supply to organs;

• classification of the respiratory system; classification of respiratory diseases, violation of external and internal factors are the main types of breathing of a stalemate processes; pathology in violation of activities in the digestive system;

• the role of parenchymal organs, types of jaundice in violation of the classification of the liver allocation system, pathological changes in violation of the basic signs of kidney disease in the nervous system of its departments; innervation of the peripheral and internal organs, and the consequences of changes in the innervation of a single department;

be able to:

• simulate and analyze the occurrence of breath reflex in rabbit by the action of ammonia; to simulate in laboratory animals change peripheral circulation by the action of heat and cold, high and low atmospheric pressure;

• simulate peripheral circulatory disorders cause in an experiment on laboratory animals, arterial and venous congestion and ischemia; distinction between the mechanisms of thrombosis;

• producing blood smears to determine the morphological composition of blood under the global microscope at typical violations of the thermal regulation of the organism in

an experiment; to characterize the changes of blood cells in smears during pathophysiological changes in the body; to distinguish normal from disease;

• distinguish between changes in the erythrocyte and leukocyte formulas in the study of the blood of experimental animals; formed elements being identified in blood smears own work with devices for physical - chemical analysis of blood;

• systematize the disease, depending on the place of origin, determine the type of digestion titer of gastric acidity;

• for clinical signs to determine changes in the body to enter the origin of hormonal drugs to simulate disturbances in the endocrine system and the activity of the heart; simulate experimental disorders of the nervous system, to determine the passage of the nerve impulse from the site of stimulation in the center; The conclusion by blocking the transmission of nerve impulse from one fiber to another. Program of the discipline

The program with the subject "Pathological physiology" for students of the direction of preparation 211 "Veterinary Medicine" is recommended and approved by the Academic Council SNAU
Minutes № 10 "23" April 2018

Content module 1. General nosology, the effect of harmful environmental factors.
Topic 1. General nosology.

The object and purpose of pathological physiology, its place in the system of higher veterinary education, communication with other disciplines. Modern methods used in the experiment. Brief information about the history of pathophysiology. The structure of the training course pathophysiology. General nosology. The concept of health. The concept of disease. Principles of classification of disease. Types of disease over. Periods of illness. Recovery is complete or incomplete: relapses, complications. The terminal condition. Dying as a step process. Preagonic state agony, clinical, biological death. Pathogenetic bases of resuscitation. Cryostasis. Winter and summer hibernation. The role of knowledge of etiology for the prevention and treatment of animals. The causes and conditions of the disease. The concept of internal and external causes of disease. The properties of pathogenic factors, their main categories. Causal principle of disease prevention and treatment of sick animals. The relationship and the role of etiologic and pathogenetic factors in the pathogenesis. Role of structural and functional changes in the pathogenesis. The role of general and local government in the pathogenesis. Leading managers and vicious circles during his illness. The spread of disease-causing factors in the body. Adaptive and reduction reactions of the organism. Mechanisms of recovery and restoration of disturbed functions. Analysis of the reflex arc during the action of pathogenic stimuli. Reflector holding your breath. The action of adrenaline on the heart and peripheral blood vessels. Local effect of heat on the rabbit ear. Local effect of cold on the rabbit ear. The value of damage to the nervous, humoral regulation in development.

Action pathogenic environmental factors.

Pathogenic effects of physical factors. Pathogenic action of mechanical factors. Local and general symptoms of reactions to effect mechanical factors. Traumatic shock, its causes, pathogenesis, consequences. The action of heat on the body. Local and

general phenomena in burns. Effect on low body temperature. The harmful effects of the rays of the solar spectrum. The mechanism of action of the laser rays and ionizing radiation on the body. The harmful effects of electricity. The mechanism of action of an electric current harmful effects of changes in atmospheric pressure. Of low and high atmospheric pressure. Hereditary and congenital diseases. The aetiology of hereditary diseases. Meaning maternal effect in pathology. The Constitution of farm animals as a favorable factor in the occurrence of diseases. Animal studies with the definition of the role of reason, enabling and supporting factors and the nature of local and general effect of high and low temperatures. Local effect of heat on the rabbit ear. Local effect of cold on the rabbit ear. Animal studies with the definition of the role of reason, enabling and supporting factors and the nature of local and general action of high and low atmospheric pressure on cardiac and respiratory functions. Action longer wavelengths of the solar spectrum, red and infrared rays. Sunstroke. The pathogenesis of radiation damage to the body. The action of atmospheric electricity (lightning damage). Influence of chemical and pharmaceutical substances. The harmful effects of sound waves.

Content module 2. The reactivity of the organism.
Topic 2. Reactivity of an organism and its importance in pathology.

Reactivity and resistance. Species reactivity. Barrier devices. Phagocytosis. Immunological reactivity. Mechanisms and components of immunological reactions. Allergies, its types and mechanisms of development. Allergic reactions immediate type. Anaphylaxis, its pathogenesis. Delayed-type hypersensitivity. Meaning of allergic reactions to the diagnosis of infectious diseases. Autoallergy. Idiosyncrasy. Barrier device body. Adsorption elements RES foreign substances introduced into the blood. Payment breathing when removing the lungs of a frog. Delay authorities RES frog 1.5% ferric chloride. The role of the components of the immune response in its development. Modeling the development of allergies. The role of the components of the immune response in its development. Study of phagocytosis by the example of single-celled organisms.

Content module 3. Pathological physiology cells, the local blood circulation and microcirculation.
Topic 3. Pathological physiology of the cell.

The main causes of damage to cells. General mechanisms of cell damage. Some of the pathophysiological mechanisms of cell dystrophies and their types. The effects of cell damage. Apoptosis, the role of apoptosis mechanisms in the event of the death of the affected cells. The role of stem cells in the restoration of the structure and function of individual tissues.

Pathological physiology local blood circulation and microcirculation.

Typical violations of microcirculation. Capillary-trophic failure. Arterial hyperemia. Stasis, its types. Ischemia. Heart attack. Bleeding. Thrombosis. Embolism. The consequences of embolism. Learning disorders symptoms of arterial hyperemia. Modeling neyroparalitichnoy arterial hyperemia. Modeling mioparalitichnoy congestion in the language of the frog. Simulation of real-stasis in the vessels of the mesentery of the frog. Thrombosis and embolism. Simulation of coagulation of red blood clot in the blood vessels. Modeling aglyutinatsiynogo white thrombus. Modeling microscopic picture of fat embolism.
Content module 4. Inflammation.

Topic 4. Inflammation.

Definition of inflammation. Signs. The pathogenesis of inflammation. Changes in the inflamed tissue. Inflammatory mediators. Classification inflammation. Meaning of inflammation to the body. The relationship of inflammation and body. Neuroendocrine regulation of inflammation. Biological principles of anti-inflammatory therapy. Inflammation is a normal response and denervated rabbit ears. To investigate the causes, mechanisms of development, the effects of inflammation, its features in different animal species. Installation of circulatory disorders and microcirculation in the inflammation.

Content module 5. Pathology thermal regulation tissues.
Topic 5. Pathology thermal regulation.

The definition of fever, general characteristics. Types of fevers. Types of febrile reactions. Completion fever. Lysis of the crisis. The biological significance of fever. Play hypothermia, hyperthermia, fever. Experimental reproduction of hypothermia, hyperthermia, fever. Changes thermoregulation. Changes in breathing. Changes in cardiac activity. Changes in the blood system in the event of a fever in animals.

Topic 6. The pathophysiological processes in tissues.

Pathophysiology processes in tissues. Giperbioticheskie processes. Hypertrophy and hyperplasia. Regeneration physiological. Pathological regeneration. Hypobiotically processes. Dystrophy. Necrosis. Tumor growth as the pathology of tumor tissue growth. Biological properties and classification of tumors. The main properties of benign and malignant tumors. Metabolism in tumors. The relationship of the tumor and the body. Features basal metabolism in laboratory animals in the case of fever and changes in the tissues. Levels of damaged tissues and organs: submolecular, molecular, subcellular level of the whole organism.

Content module 6. Pathology metabolic starvation.
Topic 7. Typical metabolic disorders. Pathophysiology of starvation.

Dysregulation metabolism. Violation of the basic exchange. Violation of carbohydrate metabolism at the stage of absorption, utilization and use of carbohydrates. Hyperglycemia. Hypoglycemia. Lipid metabolism disorders. Violation of cholesterol metabolism. Violation of protein metabolism. Disorders of digestion and absorption of protein synthesis. Hypoproteinemia. Violation of amino acid metabolism. Disruption of water - electrolyte metabolism. Swelling and edema of their classification, pathogenesis, the value for the body. Types of fasting. Full, partial qualitative starvation. Carbohydrate, fat and mineral starvation. Water fasting. Features basal metabolism in laboratory animals in the case of fever. Making smears to study morphological changes. Quantitative determination of ketone bodies in urine. Violation of the acid-alkaline balance. Acidosis and alkalosis. Determination of alkali reserve of blood in animals. Typical problems.

Content module 7. Pathophysiology of blood circulation.
Topic 8. Pathophysiology of the blood system.

General characteristics of the disorders of the blood system. Changes in the total blood volume. Hypervolemia, hypovolemia, their types and the mechanism of occurrence,

consequences. Changes in the quantitative and qualitative composition of red blood cells anemia. Changes in the quantitative and qualitative composition of white blood cells. Leukocytosis and leukopenia, their types. Platelet Pathology Etiology and pathogenesis thrombocytopathy. Determination of changes in leukocyte and leukocyte blood profile of the animal in the case of various forms of leukocytosis and leukopenia. To study the pathological changes of red blood cells in the study of blood smear. The study of physical - chemical properties of blood.
Pathophysiology of the circulatory system. General characteristics of the disorders of the circulatory system. Circulatory failure. Heart failure circulation, its pathogenesis. Overwork infarction due to its excessive volume overload and additional resistance ejection of blood. Myocardiopathy. Myocarditis, myocardial. Violation of the coronary circulation, pathogenesis and consequences. Simulation of malfunction of the heart in the experiment. The compression of the aorta and pulmonary artery. Epinephrine into a vein. Simulation of pressure changes in the blood vessels of animals, modern measuring devices. Transfusion shock. Leukemia. Vascular insufficiency, its pathogenesis. Violation of the physico-chemical properties of the blood vessel walls. Dysregulation of blood pressure. Hypertension and hypertensive.

Content module 8. Pathophysiology of respiration
Topic 9. Pathophysiology of the respiratory system.

General characteristics of the disorders of the respiratory system. Violation of the functions of the upper respiratory tract. Respiratory disorders in the pathology of the lungs: bronchitis, pneumonia, congestion, edema, pulmonary emphysema. Violation of the pleura. Pleurisy. Pneumothorax. Experience in the study of oxygen starvation. Respiratory disorders influenced by the excess of carbon monoxide in the exhaled air. Periodic breathing frog under the influence of sodium nitrate. Respiratory distress due to pulmonary perfusion disorders. Types of hypoxia consequences. Compensating changes in the cells and tissues under hypoxia - cyanosis, metabolic change. Effect of hypoxia on the nervous and cardiovascular function - vascular system, kidneys.

Content module 9. Pathophysiology of digestion
Topic 10. Pathophysiology of the digestive system.
The main forms of digestive pathology. Pathological physiology of digestion in monogastric.
Violation of digestion in the proventriculus ruminants. The digestion of proteins, starches, cellulose. Violation of the secretory function of the stomach. Tympanum. Violation of the proventriculus during traumatic retikulitu. Pathology digestion in the intestine. Selection and study the contents in the case of digestive disorders in proventriculus ruminants. Determination of protein digestion, starch, cellulose in the rumen contents. Study of gastric juice in animals with different types of disorders of the secretory function of the stomach. Tympanum. Violation of the proventriculus during traumatic retikulitu. Pathology digestion in the intestine. Forms and pathogenesis of intestinal obstruction. Consequences of digestive disorders in the gut. Self-poisoning. The pathogenesis of dyspepsia. Methods of study of the liver Eck fistula - Pavlov, resection and extirpation. Frustration Education and bile flow.

Content module 10. Pathophysiology of the liver and kidneys.
Topic 11. Pathophysiology of the liver.
Causes and consequences of impaired liver function. The etiology and pathogenesis of hepatitis and liver cirrhosis. Violation of the barrier function of the liver. Effect of blood

circulation in the liver, the kidneys in the urine formation. Modeling compression of the renal artery. Reflex anuria.

Topic 12. Pathophysiology of kidneys.

General characteristics of the disorders of the urine formation and urination.

Content module 12. Pathophysiology of reproduction and lactation.

Topic 13. Pathophysiology of reproduction and lactation.

Violation of neuro-humoral mechanisms of regulation of reproduction in animals. Violation of the reproductive organs in males. Violation of the reproductive organs in females. Pathophysiology of reproduction and lactation

Content module 13. Pathophysiology of the endocrine and nervous systems.

Topic 14. Pathophysiology of the endocrine systems.

General characteristics of the dysfunction of the endocrine glands. The etiology and pathogenesis of endocrine regulation disorders. Impaired function of the pituitary gland. The consequences of hyper and hypothyroidism. Impaired function of the parathyroid gland. Impaired function of the adrenal glands. Violation of water metabolism in animals when administered to ADH.

Topic 15.The pathophysiology of nervous systems

General etiology of disorders of the nervous system. Violation of the nerve cell and nerve fiber conduction. Impaired function of inhibitory synapses. Pathological parabiosis and dominant. Impaired function of the autonomic nervous system. Damage to the hypothalamus. Disorders of the sympathetic innervation. Vegetative neurosis. Violation of higher nervous activity. Modeling disorders of water metabolism in animals when administered ADH-vasopressin disorders of the endocrine system. Detection of motility and sensitivity in the nervous system damage. Demonstration of seizures. Experience with experimental ataxia. Hyperactivity of the ovaries. Violation of the sexual glands. Violation inside secretory - endocrine function of the pancreas. Insulin deficiency. Stress and general adaptation syndrome. Disorders of the motor functions of the nervous system. Paresis and paralysis. Hyperkinesis. Asthenia. Astasia. Violation of the sensitivity, hypoesthesia, hyperesthesia, anesthesia, paresthesia. Pain, its pathogenesis and protective value. The experimental neurosis.

4. The structure of the discipline

Names of content modules and themes	number of hours											
	full-time											
	total	including					total	including				
		L	P	Lab	Pers	S.W		L	P	Lab	Pers	S.W
1	2	3	4	5	6	7	8	9	10	11	12	13
Module 1: General pathophysiology												
Content module 1. General nosology, the effect of harmful environmental factors.												
Theme 1. General nosology. General etiology and pathogenesis of common Action pathogenic environmental factors. The role of heredity, constitution and age pathology	**10** **6**	**2**		**2**		**6** **6**						
Since the Content module 1	**16**	**2**		**2**		**12**						
Content module 2. The reactivity of the organism.												
Theme 2. Reactivity of an organism and its importance in pathology.	**6**	**2**		**2**		**2**						
Since the Content module 2	**6**	**2**		**2**		**2**						
Module 2. Typical pathological processes.												
Content module 3. Pathological physiology cells, the local blood circulation and microcirculation												
Theme 3. Pathological physiology of the cell. Pathological physiology of local blood circulation and microcirculation	**12**	**2**		**2**		**8**						
Since the Content module 3	**12**	**2**		**2**		**8**						
Content module 4. Inflammation.												
Theme 4. Inflammation	**8**	**2**		**6**								
Since the substantive	**8**	**2**		**6**								

module 4												
Module 3. Typical pathological processes												
Content module 5. Pathology thermal regulation tissues.												
Theme 5. Pathology thermal regulation	**4**	**2**		**2**								
Theme 6. The pathophysiological processes in tissues.	**10**	**2**				**8**						
Since the substantive module 5	**10**	**4**		**2**		**8**						
Content module 6. Pathology metabolic starvation.												
Theme 7. Typical metabolic disorders. Pathophysiology of starvation.	**4**	**2**		**2**								
Since the substantive module 6	**4**	**2**		**2**								
Module 4. Pathophysiology of organs and systems												
Content module 7. Pathophysiology of blood circulation												
Theme 8. Pathophysiology of the blood system Pathophysiology of the circulatory system.	**10**	**2**		**4**		**4**						
Since the content modules 4	**10**	**2**		**4**		**4**						
Module 5. Pathophysiology of organs and systems												
Content module 8. Pathophysiology of respiration												
Theme 9. Pathophysiology of the respiratory system.	**10**	**2**		**2**		**6**						
Content module 9. Pathophysiology of digestion												
Theme 10. Pathophysiology of the digestive system in monogastric Pathophysiology of the digestive system.	**10**	**2**		**2**		**6**						
Since the substantive module 5	**10**	**4**		**4**		**12**						
Module 6. Pathophysiology of organs and systems												
Content module 10. Pathophysiology of the liver and kidneys.												

Theme11. Pathophysiology of the liver.	**4**	**2**				**2**						
Theme 12. Pathophysiology of kidneys	**6**	**2**		**2**		**2**						
Since the substantive module	**10**	**4**		**2**		**4**						
Content module 11. Pathophysiology of reproduction and lactation.												
Theme 13. Pathophysiology of reproduction and lactation.	**4**	**2**				**2**						
Since the substantive module	**4**	**2**				**2**						
Content module 12. Pathophysiology of the endocrine and nervous systems												
Theme 14. Pathophysiology of the endocrine system.	**10**	**2**		**2**		**4**						
Theme 15.The pathophysiology of nervous system	**8**			**4**		**4**						
Since the substantive module 6	**14**	**2**		**4**		**8**						
Total hours	**120**	**30**		**30**		**60**						

5. Topics and lectures plan

number p / p	Name Number	those hours
	4 semester - spring	
1.	**Theme 1.** General nosology. 1. Subject and objectives of pathological physiology. 2. Modern methods used in the experiment. 3.Obschaya nosology. 4.Vidy disease. The terminal condition. 5.Rol knowledge of the etiology for the prevention and treatment of animals. 6.Svoystva pathogens. 7.Puti spread of disease-causing factors in the body. 8.Prisposoblennye and reduction reactions of the organism.Boleznetvornye action of physical factors. Pathogenic action of mechanical factors. Deystvie heat the body. The negative impact of the rays of the	2

	solar spectrum. Nasledstvennye and congenital disease. Konstitutsiya as a favorable factor in the occurrence of diseases.	
2.	**Theme 2.** Reactivity of an organism and its importance in pathology. 1.Reaktivnist and resistance. 2.Vidy reactivity. 3.Barernie devices. Phagocytosis 4.Imunologichna Reactivity 5.Mehanizmy and components of immunological reactions. 6.Alergiya, its types and mechanisms of development.	2
3.	**Theme 3.** Pathological physiology of the cell. 1. The main causes of damage to cells. 2. Some pathophysiological mechanisms of cell degeneration. 3. The effects of cell damage. Type of microcirculatory disorders. Capillary-trophic failure. Arterial hyperemia. Stasis. Ischemia. Heart attack. Bleeding. Thrombosis. Embolism.	2
4.	**Theme 4.** Inflammation. 1. Definition of the concept of inflammation. Signs. The pathogenesis of inflammation. 2. The relationship of inflammation and the body 3. Neuroendocrine regulation of inflammation. 4. Biological principles of anti-inflammatory therapy.	2
5.	**Theme 5.** Pathology thermal regulation. 1. Definition of the concept of fever, general characteristics. 2.Vidy fevers. Types of febrile reactions. Completion fever. Lysis of the crisis. 3.Biologichne value of fever.	2
6.	**Theme 6.** The pathophysiological processes in tissues. 1.Patofiziologiya processes in tissues. 2.Gipobiotichni processes. 3.Distrofii. Necrosis. 4 tumor growth. 5.Biologichni properties and classification of tumors. 6.Obmin substances in tumors. 7.Vzaemovidnoshennya tumors and body.	2
7.	**Theme 7.** Typical metabolic disorders. Pathophysiology of starvation. 1.Narushenie regulation of metabolism. 2.Narushenie carbohydrate metabolism. 3.Narushenie lipid metabolism.	2
	Total hours per semester	**14**

	Semester 5 - Autum	
1	**Topic 1. Pathophysiology of the blood system. Pathophysiology of systemic circulation.** Plan. 1. General description of disorders of blood system functions. 2. Changes in the total blood volume. 3. Changes in the quantitative and qualitative composition of erythrocytes. Anemia 4. Leukocytosis and leukopenia, their species. 5. Pathology of platelets. General characteristics of circulatory system disorders. Myocardial Pathology. Myocarditis, myocardial dystrophy. Coronary circulation disorder, pathogenesis and consequences.	2
2	**Topic 2. Pathophysiology of the respiratory system.** Plan. 1. General characteristics of respiratory system disorders. 2. Breathing disorders during lung pathology 3. Violation of the pleura function.	2
3	**Topic 3. Pathophysiology of the digestive system.** Plan. 1. Basic forms of manifestation of pathology of digestion. 2. Patological physiology of digestion in a single-chamber stomach. Disorders of digestion in the prehistoric ruminant. 3. Disorders of digestion in the intestine.	2
4	**Topic 4. Pathophysiology of the liver.** Plan. 1. Causes and consequences of liver dysfunction. 2. Etiology and pathogenesis of hepatitis and liver cirrhosis.	2
5	**Topic 5. Pathophysiology of the kidneys.** Plan. 1. General characteristics of disorders of the functions of urine formation and urination. 2. Extrarenal factors. Renal factors. 3. Quantitative and qualitative indicators of diuresis disorder. 4. Qualitative disorders of urination.	2
6	**Topic 6. Pathophysiology of the system of reproduction and lactation.** Plan. 1. Violation of the neuromuscular mechanisms of regulation of the reproductive system in animals. 2. Violation of the function of reproductive organs in males. 3. Violation of the functions of reproductive organs in females.	2
7	**Topic 7. Pathophysiology of the endocrine and nervous systems.** Plan. 1. General description of disorders of the function of the endocrine glands. 2. Violation of the function of the pituitary gland. 3. Consequences of hyper- and hypofunction of the thyroid gland.	2
8	**Topic 8. Pathophysiology of the endocrine and nervous systems.**	2

	Plan. 1. Infringement of the function of the adrenal glands. 2. General etiology of disturbance of the nervous system.	
	In all	**16**
	Total hours	**30**

6. Topics labs

number p / p	Name Number	those hours
	4 semester - spring	
1.	General nosology. Analysis of the reflex arc during the action of pathogenic stimuli. The action of adrenaline on the heart and peripheral vessels of the frog.	2
2.	The action of pathogenic environmental factors. Local effect of heat on the rabbit ear. Local effect of cold on the rabbit ear. The action of pathogenic factors of the environment, the nature of local and general action of high and low atmospheric pressure. The action of pathogenic factors of the environment, local and general action of high and low atmospheric pressure on cardiac and respiratory functions.	2
3.	The reactivity of the organism and its importance in pathology. Barrier device body. Adsorption elements RES foreign substances,1.5% ferric chloride	2
4.	The reactivity of the organism and its importance in pathology. The role of the components of the immune response in its development.	2
5.	Pathological physiology of local blood circulation. Learning disorders symptoms of arterial hyperemia. Thrombosis and embolism.	2
6.	Inflammation. Inflammation is a normal response and denervated rabbit ears. To investigate the causes, mechanisms of development, the effects of inflammation. Determination of circulatory disorders and microcirculation in the inflammation.	2
7.	Pathology thermal regulation. Experimental reproduction of hypothermia, hyperthermia, fever. The pathophysiological processes in tissues. Features basal metabolism	2
8.	Typical metabolic disorders. Features basal metabolism	2
	Total hours per semester	**16**
	Semester 5 - Autumn	
1	**Pathophysiology of the blood system.** Determination of changes in leukocyte formula and leukocyte profile animal blood. Pathophysiology of the blood system. Research of physical and chemical properties of blood.	2
2	**Pathophysiology of systemic circulation.** Simulation of heart failure in the experiment. Pressure of the aorta and pulmonary artery.	2
3	**Pathophysiology of the respiratory system.** An experiment	2

	in studying oxygen starvation. Periodic breathing in the frog under the influence of sodium nitrate.	
4	**Pathophysiology of the digestive system.** Selection and study of the content in the case of digestive disorders in the prehistoric ruminant. Definition of digestion of proteins, starch, fiber in the contents of the scar. Investigation of gastric juice in animals with different types of disturbance of the secretory function of the stomach. Influence of circulation disruption in the liver, kidneys on urine formation.	2
5	**Pathophysiology of the kidneys.** Determination of renal concentration in creatinine during experimental jade. Floridine glucosuria. Urine tests.	2
6	**Pathophysiology of the endocrine system.** Simulation of disturbance of water metabolism in animals.	2
7	**Pathophysiology of the nervous system.** Experiments to detect mobility and sensory impairment in the case of damage to the nervous system. Demonstration of seizures. Experiments to detect mobility and sensory impairment in the case of damage to the nervous system. Experiment with experimental ataxia. Simulation of animal breaches.	2
	In all	**14**
	Total hours	**30**

7. Self-study

number p / p	Name Number	those hours
	4 semester - spring	
1.	General etiology and pathogenesis of the total. The value of damage to the nervous, humoral regulation in the development of the disease.	2
2.	General etiology and pathogenesis of the total. The value of damage to the nervous, humoral regulation in the development of the disease.	2
3.	General etiology and pathogenesis of the total. The value of damage to the nervous, humoral regulation in the development of the disease.	2
4	The action of pathogenic environmental factors. Action longer wavelengths of the solar spectrum, red and infrared rays.	2
5	The action of pathogenic environmental factors. The action of atmospheric electricity	2
6	The action of pathogenic environmental factors. Influence of chemical and pharmacological substances.	2
7	The action of pathogenic environmental factors. The harmful effects of sound waves.	2
8	Reactivity of an organism and its importance in pathology.	2
9	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the affected cells.	2
10	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the	2

	affected cells.	
11	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the affected cells.	2
12	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the affected cells.	2
13	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the affected cells.	2
14	The pathophysiological processes in tissues. Levels of damaged tissues and organs: submolecular, molecular, subcellular level of the whole organism.	2
15	The pathophysiological processes in tissues. Levels of damaged tissues and organs: submolecular, molecular, subcellular level of the whole organism.	2
	Total hours per semester	**30**
	Semester 5 - Autumn	
1	Pathophysiology of the blood system.	2
2	Pathophysiology of systemic circulation.	2
3	Pathological physiology of the respiratory system (1 part).	2
4	Pathological physiology of the respiratory system (2 part).	2
5	Pathological physiology of the respiratory system (3 part).	2
6	Pathophysiology of the digestive system (1 part).	2
7.	Pathophysiology of the digestive system (2 part).	2
8.	Pathophysiology of the digestive system (3 part).	2
9.	Pathological physiology of the liver.	2
10.	Pathophysiology of the kidneys.	2
11.	Pathophysiology of the system of reproduction and lactation.	2
12.	Pathophysiology of the endocrine system (1 part).	2
13.	Pathophysiology of the endocrine system (2 part).	2
14.	Pathophysiology of the nervous system (1part).	2
15.	Pathophysiology of the nervous system (2 part).	2
	In all	**30**
	Total hours	**60**

8. Methods of study.

1. Methods of learning source of knowledge.

1.1. Verbal: story, explanation, work with the book (reading, transfer, discharge Greco-Latin terms, summarizing).

2. Methods of training in logic the nature of knowledge.

2.1. Analytical

2.2. Synthesis

3. Methods of studying the nature and level of independent intellectual activity of students.

3.1. Problematic

3.2. Part-search (heuristic)

3.3. Exploratory

3.4. Reproductive

4. Active learning methods (for example) – the use of technical training, brainstorming, using problem situations, group study, self-knowledge, simulation teaching methods (based on simulating future professional activity), and controlling the use of educational tests, the use of basic lectures

5. Interactive learning technologies – the use of multimedia technology, interactive whiteboard and spreadsheets, case-study (method of analyzing specific situations) dialog learning, students cooperation (cooperation) and others.

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9. Control methods.

1. Rating control a 100-point scale assessment ECTS
2. Holding control over the intermediate term (intermediate certification)
3. Polikryterialna assessment of the current work of students:

- the level of knowledge demonstrated in practical laboratory sessions and seminars;
- activity when discussing issues submitted to school;
- results of laboratory work and protection;
- express control during practical classes;
- self study topics in general or specific issues;
- writing essays;
- test results;
- writing assignments during the tests.

4 semester

Routine testing and independent work										In all for the modules and ISW	Attestation	Total
Module 1 -points			Module 2 -points			Module 3 -points			ISW			
T1	T2	T	T3	T4	T	T6	T7	T8		**85 (70+15)**	**15**	**100**
	12			**24**		1	**34**	9	**15**			

5 semester

Routine testing and independent work										In all for the modules and ISW	Attestation	Exem	Total
Module 1 - points			Module 2 - points			Module 3 -points			ISW				
T1					T	T5	T6	T7		**55 (40+15)**	**15**	**30**	1**00**
	6			**10**	6		**24**		**15**				

Grading scale: national **and ECTS**

Total points for all the educational activities	**Marc ECTS**	**Assessment of national scale**	
		for exam, course project (work), practice	**credit**
90-100	**A**	perfectly	counted
82-89	**B**	fine	
75-81	**C**		
69-74	**D**	satisfactorily	
60-68	**E**		
35-59	**FX**	unsatisfactory with the possibility of re-drafting	not reckoned with the possibility of re-drafting
1-34	**F**	unsatisfactorily with obligatory repeated study of discipline	not credited with obligatory repeated study of discipline

11. Recommended literature.

1. Essentials of Pathophysiology Concepts of Altered Health States 4th Edition - https://www.pinterest.com/pin/321303754648019663/
2. Pathophysiology of Disease 7th Edition - https://www.pinterest.com/pin/321303754648019658/
3. PATHOPHYSIOLOGY - https://www.lfhk.cuni.cz/Faculty/Organization-structure/Workplace-homepages/Department-of-Pathological-Physiology/Study-information/Questions/Pathophysiology-complet.aspx/
4. Pathophysiology of Disease 7th Edition PDF - https://medicalbooksfreedownload.com/pathophysiology-disease-7th-edition-pdf/
5. Pathophysiology of Disease - http://faculty.sgsc.edu/cperkins/biol%203910/Hammer_Ch10.pdf
6. Pathophysiology - http://lmpbg.org/new/downloads/pathophisiology.pdf
7. Pathophysiology - https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/nursing_students/ln_pathophysiology.pdf
8. Pathophysiology Of Disease An Introduction To Clinical Medicine, 7th Ed [PDF][tahir 99] VRG - https://archive.org/details/PathophysiologyOfDiseaseAnIntroductionToClinicalMedicine7thEdPDFtahir99VRG
9. Veterinary Pathophysiology - https://ru.scribd.com/doc/246194376/Veterinary-Pathophysiology-pdf
10. Veterinary Pathophysiology - https://sites.google.com/site/ffdhdfdhdhddsaassds/pdf-veterinary-pathophysiology-full-books-ebook