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. 03.06 PATHOLOGICAL PHYSIOLOGY
(Code number and name of the educational discipline)

Specialty 212 "Veterinary gigiena, sanitaria and espertiza"

Educational program: EWP "Veterinary gigiena, sanitaria and espertiza"

Faculty of Veterinary Medicine

2020 - 2021 academic year

Work program with the subject "Pathological physiology" for students with the direction of preparation **Specialty 212 "Veterinary gigiena, sanitaria and espertiza"**

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 _____ (T.I.Fotina)

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 - 2</td><td>Area of expertise:
21 "Veterinary Medicine"</td><td colspan="2">Normative</td></tr>
<tr><td>Module - 3</td><td rowspan="4">Specialty 212 "Veterinary gigiena, sanitaria and espertiza"</td><td colspan="2">Year of training:</td></tr>
<tr><td>Content module 6</td><td colspan="2">2020-2021 y</td></tr>
<tr><td></td><td colspan="2">Course 2

Semester</td></tr>
<tr><td>Total hours - 60</td><td>4th</td><td></td></tr>
<tr><td rowspan="9">Weekly hours for full-time education:
classroom - 2
Self robots student - 1</td><td rowspan="9">Educational qualification:
“Master”</td><td colspan="2">Lectures</td></tr>
<tr><td>14 hours.</td><td></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></td></tr>
<tr><td colspan="2">Independent work</td></tr>
<tr><td>30 hours</td><td></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

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;

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;

The program with the subject "Pathological physiology" for students of the direction of preparation 212 "VGSE" 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.
Theme 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.
Theme 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.

Theme 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.
Theme 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.

Theme 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.
Subject 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.

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 module 4	**8**	**2**		**6**								
Module 3. Typical pathological processes												
Content module 5. Pathology thermal regulation tissues.												
Theme 5. Pathology	**4**	**2**		**2**								

thermal regulation												
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**								
Total hours per semester	**60**	**14**		**16**		**30**						

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 solar spectrum. Nasledstvennye and congenital disease. Konstitutsiya as a favorable factor in the occurrence of diseases.	2
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.	2

	3. The effects of cell damage. Type of microcirculatory disorders. Capillary-trophic failure. Arterial hyperemia. Stasis. Ischemia. Heart attack. Bleeding. Thrombosis. Embolism.	
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**

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	2

	substances,1.5% ferric chloride	
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**

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 affected cells.	2
11	Pathological physiology of the cell. Apoptosis, the role of apoptosis mechanisms in the event of the death of the	2

	affected cells.	
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**

8. Teaching methods

1. Teaching methods for source of knowledge:
Eleven. Verbal: narrative explanation, lecture, work with a book - Workshop: The statements, notes, making tables.
12. Visual: a demonstration of observation.
13. Practical: laboratory method.
2. Methods of training on the nature of the logic of knowledge.
2.1.Analitichny.
3. Methods of education on the nature and level of independent intellectual activity of students.
3.1. Research
4. Active learning methods - use of means of training, the use of problematic situations, employment in manufacturing, self-knowledge, simulation teaching methods, use of teaching and supervising of tests, the use of reference lecture notes.
5. Interactive learning technology - the use of multimedia technologies.

9. Methods of control

1 Rating control on a 100-point scale assessment ECTS
2. Implementation of the interim control during the semester (intermediate certification)
3. Polikriterialna assessment of the current work of students:
- The results of the laboratory work and protection;
- Self elaborate themes in general or specific issues;
- Writing essays;
- The test results;
- Written assignments during examinations;
- Production situation.
4. Direct account in the final assessment:
- Research work;

10. The distribution points that get students (offset)

4 semester

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

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