Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of Higher Education
"St. Petersburg State University of Veterinary Medicine"

APPROVED BY
Vice-Rector for Educational
Work and Youth Policy
Sukhinin A.A.
April 10, 2026

Department of Pathological Physiology
EDUCATIONAL WORK PROGRAM

for the discipline

«PATHOLOGICAL PHYSIOLOGY OF ANIMALS»

The level of higher education
SPECIALIST COURSE

Specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»
Full-time education
Education starts in 2026

Reviewed and accepted
at a meeting of the department
on April 7, 2026
Protocol No. 8
Head of the department
of pathological physiology
Doctor of Veterinary Medicine, Professor
O.V. Kryachko

Saint Petersburg
2026

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1. AIMS AND OBJECTIVES OF THE DISCIPLINE

Pathological physiology of animals is the science of the vital activity of a sick organism.

The **purpose** of the discipline "Pathological physiology of animals" is: the development of students' logical thinking, the ability to analyze the sequence of development of pathological changes in a sick body, which is the basis for preparing students for a clinical understanding of the general principles of prevention and treatment of diseases.

To achieve this goal, the following **tasks** are solved:

- to study molecular, cellular, tissue, organ, systemic and intersystem mechanisms of typical pathological processes;
- to study the etiology, pathogenesis and outcomes of specific diseases developing in individual organs and systems;
- to analyze the nature of clinical manifestations of the main pathological processes;
- to familiarize yourself with the principles of pathogenetic therapy of diseases of individual organs and systems.

2. THE LIST OF THE PLANNED RESULTS OF THE DISCIPLINE (MODULE), CORRELATED WITH THE PLANNED RESULTS OF THE REALISED EDUCATIONAL PROGRAM

As a result of the discipline, the student prepares for the following types of activities, in accordance with the educational standard of the Federal State Educational Standard VO 36.05.01 "Veterinary."

Field of professional activity:

13 Agriculture

Competencies of the student formed as a result of mastering the discipline

Discipline study should form the following competencies:

a) General professional competencies (GPC):

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

3. THE PLACE OF DISCIPLINE IN THE STRUCTURE OF THE MPEP

3.1. The discipline (module) of the B1.O.22 "Pathological physiology of animals" is the discipline of Block 1 of the basic part of the federal state educational standard of higher education in the specialty 36.05.01 "Veterinary" (specialty level).

Mastered in the 4th, 5th semester (full-time and part-time education).

3.2. To study this educational discipline (module), the following knowledge, skills and abilities are required, formed

Animal anatomy

Knowledge: Features of the structure of the body and organs of both farm and domestic animals

Skills: Correctly navigate the structure and topography of organs in animals

Skills: Dissect organs and tissues

Cytology, Histology and Embryology

Knowledge: Features of the structure of cells, tissues, organs, their biochemical composition.

Skills: Use microscopic techniques, prepare and stain histological preparations.

Skills: Be able to identify microscopic preparations, navigate morphometry, histochemistry and cytochemistry, light microscopy

Animal physiology and ethology

Knowledge: Functioning of organs and systems in animals

Skills: Use an electrocardiograph, phonendoscope, spirometer and other laboratory equipment to study the functions of various organs.

Skills: Observing changes in basic physiological parameters

3.3. **The list of subsequent training disciplines that require knowledge, skills and abilities formed by this training discipline:**

-Clinical diagnostics
-Parasitology and invasive diseases
-Virusology and Biotechnology
-Clinical physiology
-Veterinary pharmacology. Toxicology
-Veterinary radiobiology
-Pathological anatomy
- Forensic veterinary examination
-Epizootology and infectious diseases
-Internal non-contagious diseases
-General and private surgery

-Acupressure and gynecology.

4. SCOPE OF DISCIPLINE "CORRECTION OF UNWANTED BEHAVIOR OF ANIMALS "

4.1. SCOPE OF DISCIPLINE "CORRECTION OF UNWANTED BEHAVIOR OF ANIMALS " FOR FULL-TIME EDUCATION

Type of educational work	Total Hours/Credits	Semester	
		4	5
Classroom classes (total)	**120**	**52**	**68**
Including:			
Lectures, including interactive forms	52	18	34
Practical lessons (PL), including interactive forms, among which are:	68	34	34
Practical training (PT)	14	6	8
Self-study (total)	**132**	**56**	**76**
Including:			
Report	+		+
Type of intermediate and final certification (test, exam)		**Test**	**Exam**
Total labor intensity hours/credits	**252/7**	**108/3**	**144/4**

5.THE CONTENT OF THE DISCIPLINE " PATHOLOGICAL PHYSIOLOGY OF ANIMALS "
5.1. THE CONTENT OF THE DISCIPLINE" PATHOLOGICAL PHYSIOLOGY OF ANIMALS "
(FULL-TIME EDUCATION)

№	The title	Achieved competences	Semester	Types of academic work, including students' self-study and labor intensity (in hours)			
				L	PL	PT	SS
1	**General nosology**	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of	4	**12**	**12**	**0**	**32**

		organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	1. General doctrine about the disease	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and	4	2	2		5

		society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	2. General etiology and general pathogenesis	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital	4	2	2		6

		technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	3. Pathogenic effect of environmental factors	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the**	4	4	6		6

		development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results. GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	4. Resistance and reactivity, their role in pathology	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.**	4		2		5

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	5. Role of heredity, constitution, and age in pathology	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.	4	2			5

		GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	6. Pathological physiology of the cell	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.	4	2			5

		GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
2	**Typical pathological processes**	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.	4	**12**	**16**	**6**	**32**

	1. Pathological physiology of peripheral circulation and microcirculation	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.	4		8	2	6
	2.Inflammation	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.**	4	2	4	2	6

		GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	3. Pathological physiology of heat regulation	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure	4	2	2	2	6

		for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	4. Pathological physiology of tissue growth	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional	4	2	2		6

		studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	TOTAL FOR 4TH SEMESTER		**18**	**28**	**6**	**56**
	5. Pathological physiology of typical metabolic disorders	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.	5	4			10

		GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	6. Pathological physiology of starving	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.	5	2			2

		GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body. GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
3	**Pathological physiology of organs and systems**	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.**	5	**28**	**26**	**8**	**69**

		GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	1. Pathological physiology of the blood system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with	5	4	4	2	10

		living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	2. Pathological physiology of the cardiovascular system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic	5	4	6	2	9

		microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	3. Pathological physiology of the immune system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.	5	4	4		9

		GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	4. Pathological physiology of the respiratory system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in	5	2	2		9

		animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	5. Pathological physiology of digestion	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of	5	4	2	2	9

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	6. Pathological physiology of the liver	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors	5	2	2		9

		GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	7. Pathological physiology of the rens	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for	5	2	2		3

		studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	8. Pathological physiology of the endocrine system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the	5	4	2	2	3

		impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	9. Pathological physiology of the nervous system	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies. **GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.** GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.	5	2	2		3

		GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results. GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.					
	TOTAL IN 5TH SEMESTER		**34**	**26**	**8**	**76**
	TOTAL		**52**	**54**	**14**	**132**

6. 6. THE LIST OF EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' SELF WORK

6.1. Guidelines for self-work

1. Uchebno-metodicheskoe posobie po organizatsii samostoyatel'noy raboty studentov po napravleniyam podgotovki, realizuyemym v SPbGAVM [Educational and methodical manual on the organization of independent work of students in the areas of training implemented at SPbGAVM]. Saint Petersburg: SPbGAVM Publishing House, 2018, 63 p. URL: https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTgyNjQmcHM9NjQ(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTgyNjQmcHM9NjQ (accessed on 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

6.2. Literature for independent work

1. Baimatov V. N., Meshkov V. M. Pathological physiology : textbook : approved by the Main Directorate of Higher and Secondary Agricultural Education of the Ministry of Agriculture of the Russian Federation as a textbook for students of higher agricultural educational institutions in the specialty 36.05.01 "Veterinary Medicine" / V. N. Baimatov, V. M. Meshkov ; ed. by V. N. Baimatov. Moscow: INFRA-M Publ., 2023, 411 p.

2. Savoyskiy A. G., Baimatov V. N., Meshkov V. M. Pathologicheskaya fiziologiya : [approved by the Ministry of Agriculture of the Russian Federation] : textbook for students of higher educational institutions studying in the specialty "Veterinary Medicine" / A. G. Savoyskiy, V. N. Baimatov, V. M. Meshkov ; ed. by V. N. Baimatov. - Moscow: KolosS, 2008. - 541 p.: ill. - (Textbooks and manuals for students of higher educational institutions).

3. Kryachko O. V., Lukoyanova L. A. Pathological physiology of animals : a textbook for independent work and tasks for performing control works / O. V. Kryachko, L. A. Lukoyanova; Ministry of Agriculture of the Russian Federation, SPbGUVM. Saint-Petersburg: SPbGUVM Publ., 2020, 100 p https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MzkzJnBzPTEwMA. (IN Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MzkzJnBzPTEwMA== (accessed: 07.04.2026). Access mode: for authorization. users of the SPbGUVM Library.

4. Lyutinsky S. I. Pathological physiology of farm animals: textbook / S. I. Lyutinsky. Moscow: Kolos Publ., 2001, 496 p. (in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9ODY5JnBzPTI1MA https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9ODY5JnBzPTI1MA(date of request: 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

5. Kryachko O. V., Lukoyanova L. A., Anisimova K. A. Patologicheskaya fiziologiya organov i sistem : uchebno-metodicheskoe posobie [Pathological physiology of organs and systems: an educational and methodical manual]. Saint-Petersburg: SPbGUVM Publishing House, 2022, 99 p. https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9OTg5JnBzPTEwMA(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9OTg5JnBzPTEwMA (accessed on 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

6. Pathological physiology of animals. General nosology. Kryachko O. V., Lukoyanova L. A., Gaponova V. N. Tipovye patologicheskie protsessy : uchebnoe posobie [Typical

pathological processes: a textbook]. Saint-Petersburg: SPbGUVM Publishing House, 2022, 151 p. https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTAxNSZwcz0xNTI(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTAxNSZwcz0xNTI (accessed on 07.04.2026). - Access mode: for authorization. SPbGUVM EB users

7. Kryachko O. V. Pathological physiology of animals. Kryachko O. V., Lukoyanova L. A. Short course of lectures on typical pathological processes : a textbook. Saint-Petersburg: SPbGUVM Publishing House, 2024, 98 p.https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTk1NDgmcHM9MTAw(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTk1NDgmcHM9MTAw (accessed on 07.04.2026). Access mode: for authorization. users of the SPbGUVM Library.

8. Kryachko O. V., Lukoyanova L. A. Patologicheskaya fiziologiya : uchebnoe posobie [Pathological physiology: a textbook]. Saint Petersburg: Lan Publ., 2020, 228 p . (Higher education).

9. Kryachko O. V., Lukoyanova L. A., Romanova O. V., Savicheva S. V. Dictionary of terms in pathological physiology. Saint Petersburg: SPbSAVM Publ., 2016, 74 phttps://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9NDU1JnBzPTc0. (IN Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9NDU1JnBzPTc0 (accessed on 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

7. THE LIST OF BASIC AND ADDITIONAL LITERATURE NECESSARY FOR THE EDUCATION OF THE DISCIPLINE

a) main literature:

1. Baimatov V. N., Meshkov V. M. Pathological physiology : textbook : approved by the Main Directorate of Higher and Secondary Agricultural Education of the Ministry of Agriculture of the Russian Federation as a textbook for students of higher agricultural educational institutions in the specialty 36.05.01 "Veterinary Medicine" / V. N. Baimatov, V. M. Meshkov ; ed. by V. N. Baimatov. Moscow: INFRA-M Publ., 2023, 411 p.

2. Lyutinsky S. I. Pathological physiology of farm animals: textbook / S. I. Lyutinsky. Moscow: Kolos Publ., 2001, 496 p. (in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9ODY5JnBzPTI1MA (date of request: 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

3. Kryachko O. V., Lukoyanova L. A., Anisimova K. A. Patologicheskaya fiziologiya organov i sistem : uchebno-metodicheskoe posobie [Pathological physiology of organs and systems: an educational and methodical manual]. Saint-Petersburg: SPbGUVM Publishing House, 2022, 99 p.https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9OTg5JnBzPTEwMA(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9OTg5JnBzPTEwMA (accessed on 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

4. Pathological physiology of animals. General nosology. Kryachko O. V., Lukoyanova L. A., Gaponova V. N. Tipovye patologicheskie protsessy : uchebnoe posobie [Typical pathological processes: a textbook]. Saint-Petersburg: SPbGUVM Publishing House, 2022, 151 p.https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTAxNSZwcz0xNTI(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTAxNSZwcz0xNTI (accessed on 07.04.2026). - Access mode: for authorization. SPbGUVM EB users

5. Kryachko O. V. Pathological physiology of animals. Kryachko O. V., Lukoyanova L. A. Short course of lectures on typical pathological processes : a textbook. Saint-Petersburg: SPbGUVM Publishing House, 2024, 98 p.https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTk1NDgmcHM9MTAw(in Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MTk1NDgmcHM9MTAw (accessed on 07.04.2026). Access mode: for authorization. users of the SPbGUVM Library.

b) additional literature:

1. Savoyskiy A. G., Baimatov V. N., Meshkov V. M. Pathologic physiology : [approved by the Ministry of Agriculture of the Russian Federation] : textbook for students of higher educational institutions studying in the specialty "Veterinary Medicine" / A. G. Savoyskiy, V. N. Baimatov, V. M. Meshkov ; ed. by V. N. Baimatov. - Moscow: KolosS, 2008. - 541 p.: ill. - (Textbooks and manuals for students of higher educational institutions).

2. Kryachko O. V., Lukoyanova L. A. Pathological physiology of animals : a textbook for independent work and tasks for performing control works / O. V. Kryachko, L. A. Lukoyanova; Ministry of Agriculture of the Russian Federation, SPbGUVM. Saint-Petersburg: SPbGUVM Publ., 2020, 100 phttps://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MzkzJnBzPTEwMA. (IN Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9MzkzJnBzPTEwMA== (accessed: 07.04.2026). Access mode: for authorization. users of the SPbGUVM Library.

3. Kryachko O. V., Lukoyanova L. A. Patologicheskaya fiziologiya : uchebnoe posobie [Pathological physiology: a textbook]. Saint Petersburg: Lan Publ., 2020, 228 p . (Higher education).

4. Kryachko O. V., Lukoyanova L. A., Romanova O. V., Savicheva S. V. Dictionary of terms in pathological physiology. Saint Petersburg: SPbSAVM Publ., 2016, 74 phttps://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9NDU1JnBzPTc0. (IN Russian). https://search.spbguvm.informsystema.ru/viewer.jsp?aWQ9NDU1JnBzPTc0 (accessed on 07.04.2026). - Access mode: for authorization. users of the SPbGUVM Library.

8. Electronic library systems:

1. EBS "SPBGAVM" https://search.spbguvm.informsystema.ru/
2. Scientific electronic library ELIBRARY.RU http://elibrary.ru
3. Electronic books published by Prospekt Nauki Publishing House http://prospektnauki.ru/ebooks/
4. EBS publishing house "Quadro "" Elibrica" https://elibrica.com/
5. EBS "Yurayt"
6. ConsultantPlus Legal Reference system (local access) https://www.consultant.ru/

9. METHODOLOGICAL GUIDELINES FOR STUDENTS ON EDUCATION OF THE DISCIPLINE

Methodological recommendations for students are a set of recommendations and explanations that allow the student to optimally organize the process of studying this discipline.

The content of the guidelines, as a rule, may include:

• Tips for planning and organizing the time required to study the discipline. Description of the student's sequence of actions, or "discipline study script." Morning time is the most fruitful for educational work (from 8-14 o'clock), then afternoon time (from 16-19 o'clock) and evening time (from 20-24 o'clock). The most difficult material is recommended for study at the beginning

of each time interval after rest. After 1.5 hours of operation, a break is required (10-15 minutes), after 4 hours of operation, the break should be 1 hour. Part of the scientific organization of work is mastering the technique of mental labor. Normally, a student should devote about 10 hours a day to teaching (6 hours at a university, 4 hours at home).

Recommendations for working on lecture material

In preparation for the lecture, the student is recommended:

1) to view the recordings of the previous lecture and restore the previously studied material in memory;

2) to view the upcoming material of the future lecture;

3) if an independent study of individual fragments of the topic of the last lecture is set, then it must be performed without delay;

4) to tune psychologically to the lecture.

This work includes two main stages: lecture notes and subsequent work on lecture material.

By taking notes is meant the compilation of a summary, i.e. a brief written statement of the content of something (oral speech - speech, lecture, report, etc., or a written source - document, article, book, etc.). The method of work when inspecting oral speeches differs significantly from the method of work when inspecting written sources.

Taking notes on written sources, the student has the opportunity to repeatedly read the desired passage of the text, reflect on it, highlight the main thoughts of the author, briefly formulate them, and then write it down. If necessary, he can note his attitude to this point of view. Listening to the lecture, the student should postpone most of the complex of the above works for another time, trying to use every minute to record the lecture, and not to comprehend it - there is no time left for this. Therefore, when reviewing a lecture, it is recommended to separate the fields for subsequent entries on each page in addition to the summary. After recording a lecture or compiling a summary, you should not leave work on the lecture material before starting preparation for the test. It is necessary to do as early as possible the work that accompanies the examination of written sources and which could not be done during the recording of the lecture - read your notes, deciphering individual abbreviations, analyze the text, establish logical connections between its elements, in some cases show them graphically, highlight the main thoughts, note issues requiring additional processing, in particular, teacher consultations.

When working on the text of a lecture, a student should turn special attention to the problematic issues posed by the teacher when giving a lecture, as well as to his tasks and recommendations.

For each lecture, practical lesson and laboratory work, the number is leaded, topic, list of issues under consideration, volume in hours and links to the recommended literature are provided. For classes conducted in interactive forms, their organizational form should be indicated: computer simulation, business or role-playing game, analysis of a specific situation, etc.

• Practical preparation recommendations

Practical (seminar) classes form an important part of the professional training of students. The main goal of conducting practical (seminar) classes is to form analytical, creative thinking among students by acquiring practical skills. Also, practical classes are held in order to deepen and consolidate the knowledge gained at lectures and in the process of independent work on regulatory documents, educational and scientific literature. When preparing for a practical lesson for students, it is necessary to study or repeat theoretical material on a given topic.

When preparing for a practical lesson, the student is recommended to follow the following algorithm;

1) get acquainted with the plan of the upcoming lesson;

2) study the literature sources that have been recommended and familiarize yourself with the introductory notes to the relevant sections.

Methodological guidelines for practical (seminar) classes in the discipline, along with the work program and schedule of the educational process, refer to methodological documents that determine the level of organization and quality of the educational process.

The content of practical (seminar) classes is recorded in the working curricula of the disciplines in the sections "List of topics of practical (seminar) classes".

The most important component of any form of practical training are tasks. The basis of the task is an example that is understood from the standpoint of the theory developed in the lecture. As a rule, the main attention is paid to the formation of specific skills, which determines the content of students' activities - problem solving, laboratory work, clarification of categories and concepts of science, which are a prerequisite for correct thinking and speech.

Practical (seminar) classes perform the following tasks:

- stimulate regular study of recommended literature, as well as attentive attitude to the lecture course;
- consolidate the knowledge gained in the process of lecture training and independent work on literature;
- expand the scope of professionally significant knowledge, skills, and abilities;
- allow you to verify the correctness of previously acquired knowledge;
- initiate skills of independent self-thinking, oral presentation;
- contribute to the free use of terminology;
-provide the teacher with the opportunity to systematically monitor the level of independent work of students.

Methodological guidelines for practical (seminar) classes on the discipline should be focused on modern business conditions, current regulatory documents, advanced technologies, the latest achievements of science, technology and practice, modern ideas about certain phenomena, the studied reality.

• Recommendations for working with literature.

Working with literature is an important stage of the student's self-work on mastering the subject, contributing not only to the consolidation of knowledge, but also to the expansion of horizons, mental abilities, memory, the ability to think, express and confirm personal hypotheses and ideas. In addition, the skills of research work necessary for further professional activityare developed.

When starting to study the literature on the topic, it is necessary to make notes, extracts, notes. It is mandatory to take notes of the works of theorists, which allow us to comprehend the theoretical basis of the study. For the rest, you can limit yourself to summary from the studied sources. All summaries and quotations must have the exact "return address" (author, title of the work, year of publication, page, etc.). It is advisable to write an abbreviated title of the question to which the extract or quotation refers. In addition, it is necessary to learn how to immediately compile a file of special literature and publications of sources, both proposed by the teacher and identified independently, as well as refer to bibliographic reference books, chronicles of journal articles, book chronicles, abstract journals. At the same time, publications of sources (articles, book titles, etc.) should be written on separate cards, which must be filled in according to the rules of bibliographic description (surname, initials of the author, title of the work. Place of publication, publisher, year of publication, number of pages, and for journal articles – the title of the journal, year of publication, page numbers). On each card, it is advisable to record the thought of the author of the book or a fact from this book on only one specific issue. If the work, even in the same paragraph or phrase, contains more judgments or facts on another issue, then they should be written out on a separate card. The presentation should be concise, accurate, without subjective assessments. On the back of the card, you can make your own notes about this book or article, its content, structure, on which sources it is written, etc.

• Explanations about working with control and test materials for the course, recommendations for completing homework.

Testing allows you to determine whether the actual behavior of the program corresponds to the expected one by performing a specially selected set of tests. A test is the fulfillment of certain conditions and actions necessary to verify the operation of the function under test or part of it. Each question in the discipline must be answered correctly by choosing one option.

10. EDUCATIONAL WORK

As part of the implementation of the discipline, educational work is carried out to form a modern scientific worldview and a system of basic values, the formation and development of spiritual and moral, civil and patriotic values, a system of aesthetic and ethical knowledge and values, attitudes of tolerant consciousness in society, the formation of students' need for work as the first vital necessity, the highest value and the main way to achieve success in life, to realize the social significance of your future profession.

11. THE LIST OF INFORMATION TECHNOLOGIES USED IN THE IMPLEMENTATION OF THE EDUCATIONAL PROCESS

11.1 Information technologies

For the educational process of the discipline is previewed the use of information technologies:

- practical classes using multimedia;
- interactive technologies (dialogues, collective discussion on various topics for realization a particular educational and professional task);
- interaction with students via e - mail;
- community work in the electronic information and educational environment of St. Petersburg State University: https://spbguvm.ru/academy/eios/

11.2. Software

The list of licensed and free- distributed software, including national programs

№ п/п	Technical and computer programs recommended by sections and topics of the program	License
1	MS PowerPoint	67580828
2	LibreOffice	free software
3	OS Alt Education	AAO.0022.00
4	ABIS " MARK-SQL"	02102014155
5	MS Windows 10	67580828
6	System Consult Plus	503/КЛ
7	Android OS	free software

12. THE MATERIAL AND TECHNICAL BASE NECESSARY FOR THE IMPLEMENTATION OF THE DISCIPLINE EDUCATIONAL PROCESS

The title of the discipline (module), practice in accordance with the curriculum	**The title of special rooms and rooms for self-work**	**Equipment of special rooms and rooms for self-work**
Pathological physiology of animals	216 (196084, St. Petersburg, Chernihiv str., 5) Classroom for	*Specialized furniture:* desks, chairs, blackboard, etc.

	conducting seminar-type classes, group and individual consultations, current monitoring	*Visual aids and educational materials:* posters on the sections of pathological physiology, visual aids, multimedia, TV, video player, educational films
	316 (196084, St. Petersburg, Chernihiv str., 5) Classroom for conducting seminar-type classes, group and individual consultations, current monitoring and intermediate certification	*Specialized furniture:* desks, chairs, blackboard. *Visual aids and educational materials:* posters on the sections of pathological physiology, visual aids, multimedia, TV, video player, educational films
	206 Large reading room (196084, St. Petersburg, Chernihiv str., 5) Room for independent work	*Specialized furniture*: tables, chairs *Technical training facilities:* computers with network connection Internet and access to the electronic information and educational environment
	214 Small reading room (5 Chernigovskaya St., Saint Petersburg, 196084) Room for independent work	*Specialized furniture:* tables, chairs *Technical training facilities:* computers with Internet connection and access to the electronic information and educational environment
	324 Information Technology Department (5 Chernigovskaya St., 196084, Saint Petersburg) Storage and preventive maintenance of educational equipment	*Specialized furniture:* tables, chairs, special equipment, materials and spare parts for preventive maintenance of technical training equipment
	Box No. 3 Carpentry workshop (196084, Saint Petersburg, Chernigovskaya St., building 5) Room for storage and preventive maintenance of educational equipment	*Specialized furniture:* tables, chairs, special equipment, materials and spare parts for preventive maintenance of technical training equipment

Developers:

Head of the department of pathological physiology
Doctor of Veterinary Science, Professor — O.V. Kryachko

Candidate of Veterinary Sciences, Associate Professor — V. N. Gaponova

Program abstract of the discipline
B1.O.22 «Pathological physiology of animals»
specialty 36.05.01 Veterinary Medicine
Profile: «General clinical veterinary medicine»

The purpose of the discipline: The graduate specializing in "Veterinary Medicine" must be prepared to perform production and technological tasks, organizational and managerial duties, experimental research, and treatment and preventive activities within enterprises and organizations of the agro-industrial complex. These roles must align with the nomenclature of positions designated for specialists with higher education. The graduate should also be proficient in applying an analytical approach to understanding pathological processes.

Position of the discipline in the curriculum: B1.O.22 is a necessary part of the study in the 4th and 5th semester of full-time education.

Requirements for the results of mastering the discipline: The process of studying the discipline «Pathological physiology of animals» is aimed at the formation of the following competencies:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1

To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2

To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3

To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1

To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2

To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3

To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

The abstract of the discipline: Pathological physiology is a science that studies life processes in a sick body, the laws of the emergence, development, course and outcome of diseases. The main sections of general pathological physiology: general nosology (general doctrine of disease), general etiology (doctrine of the causes and conditions of the occurrence of diseases), general pathogenesis (doctrine of the mechanisms of development of pathological processes, compensatory-adaptive reactions and restoration of impaired functions), the doctrine of typical pathological processes (inflammation, fever, starvation, tumors, hypoxia, impaired peripheral circulation, metabolism, etc.). Particular pathological physiology considers the general patterns of disorder and restoration of functions of individual organs and systems (digestion, cardiovascular, respiration, etc.). Pathological physiology helps the clinician to scientifically substantiate preventive and therapeutic measures, diagnostic methods. Pathological pathophysiology method – is animal experiment combined with clinical observation. Pathological physiology is closely related to both biological (physiology, biochemistry, cytology, etc.) and clinical disciplines. Pathological physiology together with pathological anatomy constitutes an extensive area of medical and veterinary knowledge - pathology.

The complexity of the discipline is: 252 academic hours (7 credits).

Final control of the discipline: test, exam.

Annex 1

Ministry of Agriculture of the Russian Federation
Federal State Budgetary Educational Institution
of higher education
"Saint Petersburg State University of Veterinary Medicine"

Department of Pathological Physiology

FUND OF ASSESMENT TOOLS
for the discipline

«PATHOLOGICAL PHYSIOLOGY OF ANIMALS»

Level of higher education
SPECIALIST COURSE

Specialty 36.05.01 Veterinary medicine
Profile: «General clinical veterinary medicine»
Full-time education.

Education starts in 2026

Saint Petersburg
2026

1. PASSPORT IF THE FUND OF ASSESMENT TOOLS

Table 1

№	Acquired competence	Assessed modules of a discipline	Assesment tool
1.	**GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.** GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process. GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status. GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.	**Part 1. General nosology**	
1.1		General doctrine about the disease	Seminar,tests,reports
1.2		General etiology and general pathogenesis	Seminar,tests,reports
1.3		Pathogenic effect of environmental factors	Seminar,tests,reports
1.4		Role of heredity, constitution, and age in pathology	Seminar,tests,reports
1.5		Resistance and reactivity, their role in pathology	Seminar,tests,reports
1.6		Pathological physiology of the cell	Seminar,tests,reports
	GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body. GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body. GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors GPC-2 ID-3To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as	**Part 2. Typical pathological processes**	
2.1		Pathological physiology of peripheral circulation and microcirculation	Seminar,tests,reports
2.2		Pathological physiology of heat regulation	Seminar,tests,reports
2.3		Pathological physiology of tissue growth	Seminar,tests,reports
2.4		Inflammation	Seminar,tests,reports
2.5		Pathological physiology of typical metabolic disorders	Seminar,tests,reports
2.6		Pathological physiology of starving	Seminar,tests,reports
3.		**Part 3. Pathological physiology of organs and systems**	
3.1		Pathological physiology of the blood system	Seminar,tests,reports
3.2		Pathological physiology of the cardiovascular system	Seminar,tests,reports
3.3		Pathological physiology of the immune system	Seminar,tests,reports
3.4		Pathological physiology of the respiratory system	Seminar,tests,reports

3.5	well. **GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.** GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity. GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained. GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.	Pathological physiology of digestion	Seminar,tests,reports
3.6		Pathological physiology of the liver	Seminar,tests,reports
3.7		Pathological physiology of the rens	Seminar,tests,reports
3.8		Pathological physiology of the endocrine system	Seminar,tests,reports
3.9		Pathological physiology of the nervous system,stress	Seminar,tests,reports

2. List of assessment tools

Table 2

№	Title of the assessment tool	Brief description of the assesment tool	Presentation of the assessment tool in the fund
1.	Seminar	A means of control is organized as a conversation between the teacher and the student on topics related to the discipline, and designed to clarify the amount of knowledge that students have on a certain module, topic, problem, etc. May be conducted in written form.	Questions by Discipline Topic/Section
2.	Test	A system of standardized tasks, which allows to automate the assessment of students knowledge and skills	Fund of assessment tools for the discipline
3.	Report	The product of the student's independent work, which is a summary in writing of the results obtained theoretical analysis of a certain scientific (educational and research) topics, where the author reveals the essence of the problem under study, leads different points of view, as well as own views on it	Topics of reports

3. INDICATORS AND CRITERIA FOR ASSESSING COMPETENCIES AT VARIOUS STAGES OF ITS FORMATION, DESCRIPTION OF ASSESSMENT SCALES

Table 3

Planned results of competency acquaired	The level of development				Assesment tool
	Unsatisfactory	Satisfactory	Good	Exellent	
GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.					**PC-1.** Is able to determine the biological

logicalstatus, normalclinicalsignsoforg

					and systems of the animal body.
GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many minor errors have been made	The level of knowledge corresponds to the training program, several minor errors have been made	The level of knowledge corresponds to the training program, no errors have been made	Seminar,tests, reports

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.	Basic skills were not demonstrated in solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical problems have been solved with minor errors, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks have been solved with minor errors, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws, all tasks have been completed in full	Seminar,tests, reports
GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.	Basic skills were not demonstrated in solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical problems have been solved with minor errors, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks have been solved with minor errors, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws, all tasks have been completed in full	Seminar,tests, reports
GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.					
GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and	Basic skills were not demonstrated in solving standard tasks, and gross	Basic skills have been demonstrated, typical problems have been solved with minor errors,	All the basic skills have been demonstrated, all the main tasks have been solved with minor	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws,	Seminar,tests, reports

hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.	errors occurred	all tasks have been completed, but not in full	errors, all the tasks have been completed in full, but some with flaws	all tasks have been completed in full	
GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors	Basic skills were not demonstrated in solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical problems have been solved with minor errors, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks have been solved with minor errors, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws, all tasks have been completed in full	Seminar,tests, reports
GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.	Basic skills were not demonstrated in solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical problems have been solved with minor errors, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks have been solved with minor errors, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws, all tasks have been completed in full	Seminar,tests, reports

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.					
GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.	Basic skills were not demonstrated in solving standard tasks, and gross errors occurred	Basic skills have been demonstrated, typical problems have been solved with minor errors, all tasks have been completed, but not in full	All the basic skills have been demonstrated, all the main tasks have been solved with minor errors, all the tasks have been completed in full, but some with flaws	All basic skills have been demonstrated, all main tasks have been solved with some minor flaws, all tasks have been completed in full	Seminar,tests, reports
GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many minor errors have been made	The level of knowledge corresponds to the training program, several minor errors have been made	The level of knowledge corresponds to the training program, no errors have been made	Seminar,tests, reports
GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.	The level of knowledge is below the minimum requirements, gross errors have occurred	The minimum acceptable level of knowledge, many minor errors have been made	The level of knowledge corresponds to the training program, several minor errors have been made	The level of knowledge corresponds to the training program, no errors have been made	Seminar,tests, reports

4. LIST OF CONTROL TASKS AND OTHER MATERIALS REQUIRED TO ASSESS KNOWLEDGE, SKILLS AND EXPERIENCE THAT CHARACTERIZE THE STAGES OF FORMING COMPETENCIES IN THE PROCESS OF MASTERING THE EDUCATIONAL PROGRAM

4.1.1. Typical tasks for performance monitoring for competency assessment:

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1 To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2 To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

4.1.2. Questions for competency seminar:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

Part 1. General Nosology:

Colloquium 1

1. Concept of reactivity, its types, evaluation criteria.
2. Concept of resistance.
3. External and internal barriers, structural and functional, specific and non-specific. (Barrier properties of skin, mucous membranes, bone tissue, histohematic barriers, functional barriers, humoral and cellular defense mechanisms of innate and adaptive immunity).
4. Cell cooperation in the immune response.
5. Sanogenesis, concept, mechanisms.
6. Types of compensatory reactions.
7. Stages of compensatory-adaptive reactions.
8. Regeneration and its types.
9. Decompensation.
10. Cause and condition.
11. Common causes of disease and conditions limiting or aggravating the effect of the cause.
12. Exogenous and endogenous factors leading to the onset of the disease.
13. General pathogenesis. The main pathogenetic mechanisms of disease occurrence.
14. The main link in pathogenesis.
15. Specific and non-specific links of pathogenesis.
16. Relationship of local and general changes in the body.
17. Vicious circle.
18. The concept of health and disease.
19. Periods of illness.
20. Disease outcomes.
21. Local effect on the body of low temperature (freezing).
22. General effect on the body of low temperature (hypothermia).
23. Supercooling compensation and decompensation.
24. Theories of colds.
25. Action on the body of high temperatures (infrared radiation).
26. Local action of high temperatures.
27. Burn shock. Burn disease.
28. The general effect of high temperatures (overheating - hyperthermia). Compensation and decompensation in hyperthermia.
29. Heatstroke.
30. Sunstroke.
31. Effect on the body of electric current.
32. Factors determining the effect of electric current on the body.
31. Local and general electric current action

Seminar 2

1. The effect of increased barometric pressure on the body.

2. "Deep Anesthesia."
3. "Oxygen Poisoning."
4. Caisson disease.
5. How the lung barotrauma manifests itself.
6. The effect of reduced barometric pressure on the body.
7. Mountain and altitude diseases.
8. What is decompression syndrome?
9. Hypoxia. Concept.
10. Types of hypoxia.
11. Compensatory-adaptive reactions in hypoxia.
12. What is the timing of adaptation to the highlands? What is the essence of adaptation mechanisms?
13. Effect on the body of ultraviolet radiation.
14. Photosensitization.
15. Photoallergy, pathogenesis.
16. Buckwheat and clover disease.
17. Mechanism of mutational effect of UFL.
18. Sunstroke pathogenesis.
19. Effect on the body of laser radiation.
20. Biological effects of laser radiation.
21. Laser applications in medicine and veterinary medicine.
22. The effect of visible light on the animal body.
23. Desynchronoses, effects on the body.
24. Effect on the body of radio waves.
25. Effect on the body of ionizing radiation.
26. Mechanism of direct and indirect ionizing radiation damage.
27. The mechanism of the damaging effect of ionizing radiation at the cell level. Primary response to ionizing radiation.
28. Radiosensitivity of tissues and cells.
29. External and internal irradiation.
30. Mutagenic effects of ionizing radiation.
31. Acute radiation sickness. Classification by severity.
32. Bone marrow form of radiation sickness.
33. Intestinal form of radiation sickness.
34. Toxemic form of radiation sickness.
35. Cerebral form of radiation sickness.
36. Chronic radiation sickness. Degrees and periods.
37. General principles of radiation sickness treatment.
38. Long-term effects of radiation sickness.

Part Typical pathological processes:

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the

procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

Colloquium 3 Pathological physiology of peripheral circulation and microcirculation

1. Arterial hyperemia - a concept, signs.
2. Arterial hyperemia of neurogenic origin.
3. Arterial hyperemia of myoparalytic origin.
4. Consequences of arterial hyperemia.
5. Venous hyperemia is a concept, signs.
6. Types of venous hyperemia.
7. Consequences of venous hyperemia.
8. Ischemia is a concept, signs.
9. Types of ischemia.
10. Consequences of ischemia.
11. Heart attack - concept, types, outcomes.
12. Staz - concept, etiology, types, consequences.

13. Bleeding is a concept, types.
14. Types of bleeding by the way blood leaves the blood vessels.
15. Types of hemorrhages by form.
16. Thrombosis is a concept, the causes of thrombus formation.
17. Pathogenesis of thrombosis.
18. Types of blood clots by location in the vessel.
19. Favorable outcome of thrombosis.
20. Adverse outcome of thrombosis.
21. Embolism is a concept, classification.
22. Embolism of exogenous origin.
23. Embolism of endogenous origin.
24. Pulmonary embolism.
25. Pulmonary embolism.
26. Portal vein embolism.
27. Edema: definition, signs.
28. Types of edema by etiology.
29. Types of edema by pathogenesis.
30. Congestive mechanical edema, pathogenesis.
31. Congestive cardiac edema, pathogenesis.
32. Renal edema, pathogenesis.
33. Fasting edema, pathogenesis.
34. Inflammatory edema, pathogenesis.
35. Toxic edema, pathogenesis.
36. Allergic edema, pathogenesis.
37. Nervous edema, pathogenesis.
38. Endocrine edema, pathogenesis.
39. Dropsy: concept, species.

Seminar 4

Pathophysiology of inflammation, thermoregulation and tissue growth

1. Inflammation: definition, signs
2. Etiology of inflammation
3. Pathogenesis of inflammation
4. What is alteration? What can it be due to?
5. By what principle are inflammatory mediators classified?
6. Inflammatory mediators -- humoral
7. Inflammatory mediators - cellular
8. Physical and chemical changes in the focus of inflammation
9. What does cause the development of arterial hyperemia in the focus of inflammation?
10. What supports the state of venous hyperemia in the focus of inflammation?
11. Mechanisms of exudation
12. What acts as a chemoattractant for white blood cells are in the focus of inflammation?
13. What cells are emigrate to the focus of inflammation? What is determine the sequence of their exit from the vessel?
14. Mechanisms of leukocyte emigration to the focus of inflammation
15. Classification of inflammation depending on the process prevailing in pathogenesis
16. Characteristics of purulent exudate
17. Classification of purulent inflammation
18. Fibrinous inflammation

19. Proliferative inflammation
20. Mechanisms of proliferation
21. The role of the immune system in the development of inflammation
22. The role of the nervous and endocrine systems in the development of inflammation
23. Classification of inflammation by body reactivity
24. Theories of inflammation
25. Features of the inflammatory process in cattle and pigs
26. Features of the inflammatory process in horses and dogs
27. Fever: definition, etiology
28. Pathogenesis of fever
29. Stages of fever
30. What is pyrogen? What are they? Mechanism of their action.
31. What changes are observed in the blood system with fever?
32. How does the activity of the central nervous system change with fever?
33. How does the activity of the excretory system change with fever?
34. How will the metabolism change with fever?
35. How does the activity of the cardiovascular system change with fever?
36. How does the activity of the digestive system change with fever?
37. How does the activity of the respiratory system change with fever?
38. Classifications of febrile reactions.
39. Types of non-infectious fevers.
40. Classification of fevers according to the degree of increase in body temperature.
41. Classification of fevers by temperature change in stage 2 fever.
42. Constant fever.
43. Relieving fever.
44. Recurrent fever.
45. Intermittent fever.
46. Wasting fever.
47. Ephemeral fever.
48. Atypical fever.
49. Why is hyperpyretic fever dangerous?
50. What is the difference between a febrile reaction and hyperthermia?
51. Significance of fever to the body.
52. Biological significance of febrile reaction.
53. A tumor is the concept of how the title of a tumor develops.
54. Etiology of tumor growth.
55. Pathogenesis of tumor growth.
56. Basic properties of benign tumors.
57. What is the negative effect of a benign tumor on the body?
58. Main properties of malignant tumors.
59. The main differences between benign and malignant tumors.
60. Forms of tumor growth.
61. Anaplasia - concept, species.
62. Forms of tumor cell atypism.
63. Paraneoplastic processes.
64. Biological carcinogenesis.
65. Theory of tumor growth R. Virkhov.
66. The theory of tumor growth by Yu. Kongheim.
67. Oncogenic theory of tumor growth.
68. Chemical carcinogenesis.
69. Physical carcinogenesis.
70. Viral carcinogenesis. Give examples of tumors.

71. Epigenomic transformation.
72. What is cell transformation? How does it happen?
73. What is the body's antiblastoma resistance?
74. Give examples of hormone-dependent tumors.
75. Mechanisms of metastasis.
76. Stages of tumor progression.
77. Ways to eliminate transformed cells from the body.
78. What are the principles on which tumor therapy is based?

4.1.3. Themes of the reports

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

1. Formation and development of pathological physiology in Russia.
2. Historical aspects of disease teaching.
3. Effects of domestication and industrial ranching on animal morbidity.
4. Biological rhythms in pathology.
5. Modern theories of aging.
6. Mechanisms of radiation damage and subsequent recovery.
7. Mechanisms of biological effects of laser radiation on the body.
8. Damaging effect of the sound stimulus on the animal body.
9. Induction of tolerance and renting disease in animals.
10. Autoimmune animal diseases.
11. Causes and mechanisms of immunodeficiency in farm animals.
12. Etiology and pathogenesis of microcirculation disorders.
13. Pathogenetic aspects of thrombus formation, its consequences.
14. Species features of inflammation in farm animals.
15. Steroid hormones in the pathogenesis of inflammation.
16. Relationship of inflammatory and immune responses.
17. Significance of fever to the body.
18. Species features of a febrile reaction in horses, pigs, cattle.
19. Pathogenetic aspects of primary ketosis in cows.
20. Etiology and pathogenesis of hypovitaminosis A in animals.
21. Diabetes mellitus. Causes, genesis, consequences.

4.1.4 Tests

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

1. What is "MONOKAUZALIZM"?
1) - the theory explaining developing of a disease with a complex of adverse environmental conditions
2) - the theory explaining developing of a disease only with violation of heredity
3) - the theory explaining developing of a disease only with one reason
4) - the theory explaining developing of a disease with combination of circumstances

2. What is "TANATOGENEZ"?
1) - the section of a pathophysiology studying the recovery mechanism
2) - the section of a pathophysiology studying the mechanism of development of a disease
3) - the section of a pathophysiology studying the dying mechanism
4) - the section of a pathophysiology studying the mechanism of development of complications

3. How is the strong, balanced mobile type of nervous system called?
1) - melancholiac

2) - sanguine person
3) - choleric person
4) - phlegmatic person

4. What does belong to specific factors of protection of an organism?
1) - system of lysozyme
2) - system of interferon
3) - system of properdin
4) - immune reaction to antigen

5. What class of immunoglobulins (Ig) has the sekretorny and serumal forms?
1) - Ig G
2) - Ig A
3) - Ig E
4) - Ig M
5) - IgD

6. What decrease of the activity of organellas leads to disorders of power function of a cage?
1) - lysosomes
2) - mitochondrions
3) - ribosomes
4) - peroxysom

7. What is peculiar to the Second period of a disease?
1) - lack of clinical signs
2) - emergence of nonspecific signs
3) - emergence of specific signs
4) - lethal outcome

8. What is characterizes a pathological state?
1) - short-term reaction of an organism to an irritant
2) - functional changes
3) - structural, irreversible changes
4) - Absolute recovery

9. What clinical sign is shown venous hyperaemia?
1) - puffiness
2) - local temperature increase
3) - morbidity
4) - fever

10. How arterial hyperaemia is shown?
1) - gipoyesteziya
2) - cyanosis
3) - local fall of temperature
4) - reddening

11. In what body does the white heart attack develop more often?
1) - in a kidney
2) - in a lung
3) - in brain tissue

4) - in an intestines wall

12. In what body does the red heart attack develop more often?
1) - easy
2) - heart
3) - kidneys
4) - to a spleen

13. What outcome of thrombosis is positive?
1) - heart attack
2) - thrombembolia
3) - vessel obturation
4) - sewerage

14. Who is the founder of the doctrine about a fagotsitoza?
1) - I.P. Pavlov.
2) - I.M. Sechenov.
3) - I.I. Mechnikov.
4) - London E.S.

15. What is ascites?
1) - pericardium dropsy
2) - dropsy of a chest cavity
3) - dropsy of an abdominal cavity
4) - dropsy of ventricles of a brain

16. At what damage of organellas there is a self-digestion of a cage?
1) - mitochondrions
2) - lysosomes
3) - ribosomes
4) - peroxysom

17. What does belong to nonspecific factors of protection?
1) - T-system of immunity
2) - V-system of immunity
3) - system of a complement
4) - immunoglobulins

18. What does belong to specific factors of protection?
1) - T-system of immunity
2) - properdin
3) - system of a complement
4) - system of interferon

19. What is understood as an immunodeficiency?
1) - insufficiency of the immune answer to anti-gene loading
2) - formation of antibodies to own fabric structures
3) - repeated hit of antigen to a sensibilized organism
4) - increase in reactivity of an organism

20. What function is carried out T-helpery?
1) - фагоцитоз pathogenic microorganisms

2) - stimulation of V-cages
3) - supressiya of V-lymphocytes
4) - transfer of information

21. Who is considered the founder of humoral pathology?
1) - Hippocrates
2) - Galen
3) – Virkhov
4) - Mechnikov

22. What title is carried by Virkhov's theory?
1) - Tsellyulyarny pathology
2) - Humoral pathology
3) – a fagotsitoza
4) - immunological reactivity

23. What body dies first of all?
1) - a bone
2) - a liver
3) - a brain
4) - heart

24. What is etiology according to constitutionalism?
1) - vicious constitution
2) - "respiratory" type of the constitution
3) - "muscular" type of the constitution
4) - gene and chromosomal violations

25. How the short-term unusual answer to the pathogenic irritant which is followed at animals by decrease in efficiency is called?
1) - pathological process
2) - a pathological state
3) - pathological reaction
4) - a faint

26. How is time from emergence of the signs, general for many diseases, to symptoms of a disease, classical, specific to this pathology, called?
1) - the latent period
2) - prodromal period
3) - the period of clinically expressed signs
4) - a disease outcome

27. What is pathogenesis?
1) - the mechanism of development of a disease
2) - doctrine about an etiology
3) - disease symptom
4) - basis of pathological process

28. What is apoptosis?
1) - the programmed cage death
2) - accidental death of a cage
3) - consequence of gene violation of regulation of cell division

4) - boundless cell division

29. How is called polnokrovy body or the site of fabric owing to excessive inflow of arterial blood?
1) - стаз
2) - ischemia
3) - arterial hyperaemia
4) - venous hyperaemia

30. What is the title of a decrease in the blood volume of an organ due to a decrease in the flow of arterial blood?
1) -ischemia
2) -arterialnaiperemia
3) -Venomyiperemia
4) -embolism

31. What is the title of the formation of the focus of necrosis due to ischemia?
1) - ischemic infarction
2) -hemorrhagic infarction
3) -thromboembolism
4) - stroke

32. What is the title of ischemia due to compression of a vessel or tissue site?
1) -angiospastic
2) - compression
3) - maintenance
4) -reflector

33. What is the title of a blood clot consisting of platelets, white blood cells and plasma proteins?
1) - red
2) - white
3) - mixed
4) - hyaline

34. What is thrombosis?
1) -mortal blood coagulation
2) - vital coagulation of blood and lymph outside the vessel
3) -agonal coagulation of blood and lymph
4) - vital coagulation of blood and lymph in the lumen of the vessel

35. Where is the thermoregulation center?
1) - cerebral cortex
2) - hypothalamus
3) hypophysis
4) - muscle

36. What is the term for paralysis of one limb?
1) - monoplegia
2) - paraplegia
3) - tetraplegia
4) -Analgesia

37. What is the title of the loss of pain sensitivity?
1) - analgesia
2) - ataxia
3) -akinesis
4) -anesthesia

38. What is the title of a disorder of motor function of the nervous system, manifested by the appearance of excessive movements?
1) - hyperkinesis
2) -asthenia
3) -ataxy
4) -Analgesia

39. What is the title of a functional disorder of higher nervous activity?
1) - neurosis
2) - parabiosis
3) - ataxia
4) -Analgesia

40. What is the title of sensitivity enhancement?
1) - hyperesthesia
2) - anesthesia
3) -Hypoesthesia
4) – hypertension

4.2 Typical tasks for performance monitoring for competency assessment:

4.2.1 Questions for competence assessment colloquium:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

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GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

Part "Pathological physiology of organs and systems."
Colloquium Cardiovascular pathology

1. What is dilation? What types of dilatation do you know?
2. What is myocardial hypertrophy? List its types?
3. Sinus tachycardia. Determination, pathogenesis, ECG changes.
4. Circulatory failure. Her views.
5. What are heart defects? Etiology of vices.
6. Sinus (respiratory) arrhythmia. Determination, pathogenesis, ECG changes.
7. Sinus bradycardia. Determination, pathogenesis, ECG changes. Cardiac tamponade.
8. Etiology of atherosclerosis.
9. Myocarditis. Definition, etiology, implications.
10. Hypotension. Definition, etiology.
11. Secondary hypertension. Definition, views.
12. Aortic valve insufficiency.
13. Nodal rhythm and idioventricular rhythm. Determination, pathogenesis, ECG changes.
14. Atrioventricular extrasystole. Determination, pathogenesis, ECG changes.
15. Primary hypertension. Definition, stages.
16. Aortic orifice narrowing
17. Atrial extrasystole. Determination, pathogenesis, ECG changes.
18. Bivalve insufficiency
19. Narrowing of the left atrioventricular foramen
20. Atherosclerosis. Definition.
21. Sinoauricular block. Determination, pathogenesis, ECG changes.
22. Etiology and consequences of atherosclerosis
23. Ventricular extrasystole. Determination, pathogenesis, ECG changes.
24. Pulmonic valve insufficiency
25. Pulmonary artery stenosis
26. Atrial fibrillation. Determination, pathogenesis, ECG changes.
27. Myocardial infarction. Definition, causes, consequences.
28. Endocarditis. Definition and classification by localization.
29. Atrioventricular longitudinal block. Determination, pathogenesis, ECG changes.
30. Endocarditis. Definition and classification by clinical and anatomical manifestations.
31. Tricuspid valve insufficiency.

32. Atrial flutter. Definition, pathogenesis, changes in
33. Tricuspid valve stenosis.
34. Types of compensation for circulatory failure.
35. Atrioventricular incomplete blockade. Determination, pathogenesis, ECG changes.
36. What does the level of blood pressure depend on?
37. Atrioventricular complete block. Determination, pathogenesis, ECG changes.
38. Atherosclerosis theories.
39. Clinical signs of circulatory failure. Describe the pathogenesis of their development.

Seminar Pathology of blood and immune system

1. Anemia - definition, etiology, compensation of the body for anemia.
2. Classification of anemias by type of hematopoiesis.
3. Hemolytic anemia.
4. Posthemorrhagic anemia.
5. Iron deficiency anemia.
6. Toxic anemia.
7. Anaplastic anemia.
8. Sickle cell disease.
9. Thalassemia.
10. Folio-deficiency anemia.
11. Characteristics of anemias: by bone marrow reaction.
12. Erythrocyte pathology by size and shape.
13. The pathology of the color of erythrocytes and pathological inclusions in them.
14. Types of erythrocytosis: absolute, relative.
15. Basophilic leukocytosis.
16. Eosinophilic leukocytosis.
17. Neutrophilic leukocytosis.
18. Lymphocytosis.
19. Monocytosis.
20. Leukopenia - concept, etiology, species.
21. Thrombocytopenia.
22. Leukemia - concept, types.
23. Lymphoid leukemia.
24. Myeloid leukemia.
25. Reticuloendothelial leukemia.
26. Immediate hypersensitivity reaction - reagin (anaphylactic) type.
27. Immediate hypersensitivity reaction - cytotoxic type.
28. Immediate hypersensitivity reaction - reactions of immune complexes.
29. Delayed hypersensitivity reaction - mediated by T cells.
30. Hypervolemia, species.
31. Hypovolemia, species.
32. Mechanism of immune response.
33. Immune deficiency of the stem hematopoietic cell.
34. Autoimmune diseases.
35. Immunological tolerance.

36. Characterization of the T system of immunity.
37. Characterization of the B immunity system.
38. Complement system.
39. Deficiency of the T-lymphocyte system.
40. Combined immunodeficiency.
41. Immunodeficiencies caused by defects in nonspecific protection factors.
42. Immunodeficiency is a concept, a general classification of immunodeficiencies.
43. Lymphogranulomatosis.
44. Infectious mononucleosis.
45. Classification of antigens.
46. Allergies and types of allergens.
47. Classification of allergies: depending on the rate of occurrence and intensity of clinical signs.
48. Classification of allergies: by the nature of the manifestation.
49. Classification of allergies: depending on the sensitizing agent.
50. Classification of allergies: depending on the type of allergens.
51. Stages of development of an allergic reaction.
52. Effects of histamine in an allergic reaction.
53. Mechanism of serum sickness.
54. Arthus reaction.
55. Overy phenomenon.
56. Method A.M. Bezi.
57. Anaphylactic shock.
58. Desensitization and its types.

Seminar Pathology of respiration, urination, digestive system and liver

1. Pneumothorax - concept, types.
2. Asphyxia is a concept, types.
3. Periodic Biota breathing.
4. Chain-Stokes periodic breathing.
5. Kussmaul's periodic breathing.
6. Types of hypoxia.
7. Dyspnea - determination, types of dyspnea depending on the difficulty of the act of inhalation and exhalation.
8. Pneumonia.
9. Bronchitis.
10. Pulmonary emphysema.
11. Cough.
12. Sneezing.
13. Pneumothorax - concept, types.
14. Rare deep breathing.
15. Frequent deep breathing.
16. Frequent shallow breathing.
17. Restrictive respiratory failure.
18. Obstructive pulmonary insufficiency.
19. Proteinuria, causes.
20. Glucosuria, causes.
21. Cylinders, causes and types of cylinders.

22. Indicanuria.
23. Hemoglobinuria, causes.
24. Hematuria, species and causes.
25. Crystalluria.
26. Urolithiasis, causes and pathogenesis.
27. Uremia, species and pathogenesis.
28. Diabetes insipidus.
29. Nephrotic syndrome (nephrosis).
30. Polyuria, causes.
31. Anuria, causes.
32. Urolithiasis.
33. Jade.
34. Renal amyloidosis.
35. Pollakiuria, causes.
36. Types of concretions in the bladder.
37. Aminoaciduria, causes.
38. Renal causes of urinary disorders.
39. Extrarenal causes of urinary and urinary disorders.
40. Hyperacidal gastritis.
41. Hypoacid gastritis.
42. Anacid gastritis.
43. Hypokinetic type intestinal dyskinesia.
44. Hyperkinetic-type intestinal dyskinesia.
45. Appetite and thirst disorder.
46. Ileus: concept, species.
47. Disorder of the act of swallowing.
48. Salivation disorder.
49. Neonatal animal dyspepsia.
50. Scar tympania, causes and consequences.
51. Esophageal dysfunction.
52. Enteritis.
53. Malabsorption syndrome.
54. Traumatic reticulitis, causes and consequences.
55. Dysbiosis, causes and consequences.
56. Etiology of diseases of the gastrointestinal tract.
57. Characterize the relationship of secretory and motor functions in the stomach and intestines.
58. Gastric ulcer, theory, pathogenesis.
59. Cholelithiasis, causes and consequences.
60. Cholemic syndrome.
61. Cholelithiasis.
62. Hepatitis.
63. Cirrhosis.
64. Fatty liver.
65. Role of the liver in protein metabolism.
66. Role of the liver in lipid metabolism.
67. Role of the liver in carbohydrate metabolism.
68. Experimental liver research methods.
69. Impaired antitoxic liver function.
70. Bilirubin exchange.
71. Acholic syndrome.
72. Acholia, causes and consequences.

73. Adrenal jaundice causes and consequences.
74. Hepatic jaundice, causes and consequences.
75. Subhepatic jaundice, causes and consequences.

Seminar Pathology of nervous and endocrine systems

1. General etiology of disorders of endocrine regulation of the body.
2. Adrenal dysfunction.
3. Thyroid dysfunction.
4. Parathyroid dysfunction.
5. Epiphysis dysfunction.
6. Thymic dysfunction.
7. Gigantism, acromegaly.
8. Impaired pituitary function.
9. Glandular endocrine regulation disorders.
10. Extracellular endocrine regulation disorders.
11. Adrenal medulla dysfunction.
12. Adrenal cortex malfunction.
13. Hypofunction of the thyroid gland.
14. Hypofunction of the posterior pituitary gland.
15. Posterior pituitary hyperfunction.
16. Thyroid hyperfunction.
17. Hypofunction of gonads of male and female animals.
18. Pancreatic increer dysfunction.
19. Hyperfunction of the gonads.
20. Endemic goiter.
21. Impaired feedback mechanism in endocrine regulation.
22. Hyperparathyroidism.
23. Hypoparathyroidism.
24. Hypercorticism.
25. Graves' disease.
26. Pituitary nanism.
27. Castration of animals before and after puberty - an effect on the body.
28. Causes of endocrinopathies.
29. Outline the essence of G. Selye's concept of stress (adaptation syndrome).
30. Stress, definition, causes, consequences.
31. What is characterized by the 1st stage of stress.
32. What is characterized by the 2nd stage of stress.
33. What is characterized by the 3rd stage of stress.
34. Motor disorder (ataxia, astasia, asthenia) of the nervous system function.
35. Violation of the sensitive function of the nervous system.
36. Disorder of the motor (hypokinesis) function of the nervous system.
37. Disorder of the motor (hyperkinesis) function of the nervous system.
38. Cerebellar function disorder.
39. Ataxia is a concept, species.
40. Types of sensitivity (receptor).
41. Chorea.
42. Convulsions are a concept, types.
43. The meaning of pain for the body.
44. Impaired trophic function of the nervous system.
45. Astasia, athetosis - concepts.
46. Paresis - concept, views.

4.2.2 Themes of the reports:

Competitions to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

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GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

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To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

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To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

1. Etiology and pathogenesis of bovine and ovine leukemia.
2. Etiology and pathogenesis of iron deficiency anemias in animals of different species.
3. Role of antianemic substance (Castle factor) in the pathogenesis of anemias.
4. Etiology and pathogenesis of traumatic pericarditis in cattle.
5. Use of trunk leads to record electrocardigrams in healthy and diseased ungulates.
6. Relationship of local and systemic immunity.
7. Consequences of malfunctions of the thymus gland.
8. Immune responses in helminthiasis.
9. Apoptosis, its place in immune responses.

10. Autoimmune processes and diseases.
11. General pathogenesis of animal respiratory colds.
12. Evolution of ideas about the etiology and pathogenesis of peptic ulcer disease.
13. Role of gastrointestinal hormones in digestive system pathology.
14. Microflora of the pre-stomachs, the role of its disorders in the pathology of digestion in cows and sheep.
15. Etiology and pathogenesis of fatty liver in animals.
16. Etiology, pathogenesis and sequelae of cholelithiasis.
17. Ovarian hyperfusion in cows.
18. Growth disorders of endocrine origin.
19. Etiology, pathogenesis and treatment of urolithiasis.
20. Effects of stress on farm animal productivity.
21. General adaptation syndrome. The teachings of G. Selje on stress.
22. Pain, its effect on the animal body.
23. The doctrine of nervous trophism and its violations.
24. Ethological principles for the prevention of farm animal diseases.
25. Pathogenetic underpinnings of acupuncture in veterinary medicine.

4.2.3 Tests:

Competitions to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

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To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

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modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

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GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

CLOSED-TYPE TASKS

Combined tasks with a choice of one correct answer from the suggested options

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

Task 1.
Read the text and choose the correct answer.
Specify the causes of mechanical jaundice:
1. obturation of the hepatic and common bile duct;
2. urolithiasis;
3. hemolysis of red blood cells;
4. bilirubinemia.
Answer: 1

Task 2.
Read the text and choose the correct answer.
Pathological increase in appetite is denoted by the term:
1. para-anorexia;
2. dysphagia
3. aphagia;
4. hyperrexia.
Answer: 4

Task 3.
Read the text and choose the correct answer.
Violation of higher nervous activity is called:
1. generator of pathologically enhanced arousal;
2. paralysis.
3. neurosis;
4. pain.
Answer: 3

Tasks of a combined type with a choice of several correct answers from the suggested options

Task 4.
Read the text and choose the correct answers.
A veterinarian needs to know the etiology in order to:
1. correctly assess the development of the disease;
2. properly treat the animal;
3. do not allow the cause to come into contact with the body;
4. ensure the cost-effectiveness of treatment.
Answer: 1,2,3.

Task 5.
Read the text and choose the correct answers.
Depending on the prevailing process, inflammation is distinguished:
1. alternative;
2. proliferative;
3. acute;
4. exudative;
5. subacute;
6. chronic
Answer: 1,2,4.

Closed-type compliance tasks

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

Task 6.
Read the text and make a match.
Establish a correspondence between groups and types of exogenous etiological factors for their implementation: for each position in the first column, select the corresponding position from the second column.

Groups		**Types**	
A	Mechanical	1	Acid
B	Physical	2	Injury
C	Chemical	3	Stress
D	Psychogenic	4	Laser

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A2B4C1D3.

Task 7.
Read the text and make a match.
Establish a match between the terms: for each position in the first column, select the corresponding position from the second column.

Terms		**of Definition**	
A	Ischemia	1	Intravital blockage of blood vessels by any particles

B	Thrombosis	2	Cessation (reduction) of blood flow to the tissue site
C	Embolism	3	Intravital necrosis of the tissue
D	Infarction	4	Intravital formation of clots inside the vessel

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A2B4C1D3.

Task 8.

Read the text and make a match.

Match the names of B vitamins: for each item in the first column, select the corresponding item from the second column.

Short name of vitamin		**Full name of vitamin**	
A	B_{12}	1	Folic acid
B	B_9	2	Thiamine
C	B_1	3	Cyanocobalamin
D	B_6	4	Riboflavin

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A3B1C2D4.

Task 9.

Read the text and make a match.

Establish a correspondence between the theories of inflammation and their founders: for each position in the first column, select the corresponding position from the second column:

	Theory		**Founders**
A	Vascular	1	Alpern D.
B	Phagocytic	2	Kongeym Yu
C	Neuro-reflex	3	Virchow R.
D	Nutritive	4	Mechnikov I.

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A2B4C1D3.

Task 10.

Read the text and make a match.

Establish a correspondence between the syndrome and its clinical manifestations. For each position given in the left column, select the corresponding position from the right column.

Syndromes		**Manifestation**	
A	Jaundice	1	Polyuria, polydipsia, glucosuria
B	Acute heart failure	2	Icteric, pruritus, nervous system disorder

C	Diabetes mellitus	3	Cyanosis, tachycardia, pulmonary edema
D	Malabsorption	4	Metabolic disorder, diarrhea, steatorrhea

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A2B3C4D1.

Closed - type tasks for establishing a sequence

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

Task 11.

Read the text and set the sequence.

Arrange in the correct sequence the stages of development of changes in the microcirculatory bed during inflammation. Write down the numbers in the correct sequence.

1. venous hyperemia;
2. spasm;
3. stasis.
4. arterial hyperemia;

Answer:2,4,1,3.

Task 12.

Read the text and set the sequence.

Arrange the stages of phagocytosis in chronological order. Write down the numbers in the correct sequence of its stages.

1. phagolysosome formation;
2. adhesion;
3. digestion;
4. chemotaxis;
5. phagosome formation.

Answer: 4,2,5,1,3

Task 13.

Read the text and set the sequence.

Arrange the stages of oncogenesis in chronological order. Write down the numbers in the correct sequence.

1. promotion;
2. transformation.
3. tumor progression;

Answer: 2,1,3

Task 14.

Read the text and set the sequence.

Arrange in chronological order the development of the consequences of venous hyperemia. Enter the correct answer numbers in chronological order:

1. hypoxia;
2. tissue atrophy;
3. trophic disorder;
4. transudation.

Answer: 3,1,4,2.

Task 15.

Read the text and set the sequence.

Arrange the periods of illness in chronological order. Enter the correct answer numbers in chronological order:

1. the peak period.
2. exodus.
3. prodromal;
4. latent.

Answer: 4,3,1,2.

OPEN-TYPE TASK

Task 16.

Read the task text and write down a detailed, reasonable answer.

List and describe the protective and adaptive responses to blood loss.

Answer: vascular spasm caused by irritation of special receptors; acceleration of the blood clotting process under the influence of high concentrations of thrombin; excitation of the sympathetic nervous system, the functionality of the adrenal glands increases, more catecholamines, an antidiuretic hormone that retains water in the body, are released into the bloodstream; oxygen transport switches to vital organs; increased contractile activity of the myocardium; flow of interstitial fluid into the bloodstream. blood flow to normalize plasma levels; increase the volume of circulating blood due to the withdrawal of deposited blood and tissue fluid, which leads to normalization of blood pressure, restoration of the protein composition of the blood, and improvement of blood supply to organs.

Task 17.

Read the task text and write down a detailed, reasonable answer.

Expand the concept of "extrasystole".

Answer: Extrasystole - an extraordinary contraction of the heart or its individual parts (for example, ventricles or atria) under the influence of an additional impulse from the ectopic focus of arousal. It can occur with heart defects, endo-and myocarditis, and atherosclerosis.

Task 18.

Read the text and write down a detailed, reasoned answer.

What characterizes "Biot Respiration"?

Answer: Biota respiration **is** a form of periodic respiration characterized by an alternation of uniform rhythmic breathing movements characterized by a constant amplitude, frequency and depth, and long (up to half a minute or more) pauses. It is observed in organic brain lesions, circulatory disorders, intoxication, shock. It can also develop with primary damage to the respiratory center by a viral infection and other diseases accompanied by damage to the central nervous system, especially the medulla oblongata.

Task 19.

Read the text and give a detailed reasoned answer

List the causes of impaired swallowing function in animals.

Answer: cessation of saliva separation; tongue diseases (glossitis); spastic contractions of the swallowing muscles (rabies); paralysis or paresis of the efferent nerves that ensure the coordination of the participating muscles in the process of swallowing food; mechanical obstruction (foreign body); inflammation of the nasopharyngeal mucosa (pharyngitis, laryngitis).

Task 20.

Read the text and write down a detailed, reasoned answer.

Expand the concept of the "Virchow Triad".

Answer: The following causes of thrombosis are distinguished (the "Virchow Triad"): **the factor of slowing down the blood flow in the vessel** leads to a redistribution of shaped elements in the bloodstream, their deviation from the central axial blood layer and to their accumulation, primarily white blood cells and platelets, near the vessel wall; **the factor of damage to the vessel wall (intima),** its integrity, perfect smoothness which, under normal conditions, contributes to the unhindered sliding of blood through it;**it is an actor of changes in blood composition** – first of all, blood thickening, dehydration, an increase in the number of shaped elements, especially platelets, an increase in their adhesive properties, an increase in the level of blood fibrinogen, an increase in calcium ions.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

CLOSED-TYPE TASKS

Combined tasks with a choice of one correct answer from the suggested options

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

Task 1.

Read the text and choose the correct answer.

The main etiological factor for the occurrence of fever:

1. estrogens;
2. pyrogens
3. carcinogens;
4. mutagens.

Answer: 2

Task 2.
Read the text and choose the correct answer.
Subfebrile temperature is:
1. temperature increase within 0.5 °C;
2. temperature increase within 2 °C;
3. temperature increase within 1 °C;
4. temperature rise within 3 °C.
Answer: 3

Task 3.
Read the text and choose the correct answer.
What type of inflammation is characterized by a predominance of damage processes?
1. exudative;
2. serous;
3. alternative;
4. proliferative;
Answer: 3

Tasks of a combined type with a choice of several correct answers from the suggested options

Task 4.
Read the text and choose the correct answers.
Which inflammatory mediators are preformed?
1. serotonin;
2. thromboxane;
3. histamine;
4. prostacyclin;
5. adrenaline;
6. acetylcholine
Answer: 1,3,5,6.

Task 5.
Read the text and choose the correct answers.
List the factors that contribute to metastasis:
1. adhesion to the endothelium;
2. fever;
3. angiogenesis;
4. cachexia.
Answer: 1,3

GPC-2 ID-2
To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

Closed-type compliance tasks

Task 6.

Read the text and make a match.

Establish a correspondence between the main functions of the heart and their disorders: for each position in the first column, select the corresponding position from the second column.

	Heart function		Disorders
A	Automatism	1	Block
B	Excitability	2	Sinus bradycardia
C	Conduction	3	Fibrillation
D	Contractility	4	Extrasystole

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A2B4C1D3.

Task 7.

Read the text and make a match.

Establish a correspondence between the terms and their definition: for each position in the first column, select the corresponding position from the second column.

	Terms		Definition
A	Hyperpnea	1	Lack of breathing
B	Apnea	2	Rare breathing
C	Bradypnea	3	Frequent shallow breathing
D	Polyp	4	Frequent deep breathing

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A4B1C2D3.

Task 8.

Read the text and make a match.

Establish a correspondence between the type of hypoxia and the cause of its occurrence: for each position in the first column, select the corresponding position from the second column.

	Type of hypoxia		Cause
A	Respiratory	1	Anemia
B	Blood	2	Pneumonia
In	C Tissue	3	Ischemia
D	Circulatory	4	Hyperbaria

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A2B1C4D3.

Task 9.

Read the text and make a match.

Establish a correspondence between the terms and their definition: for each position in the first column, select the corresponding position from the second column:

	Term		Definition
A	Boil	1	Purulent inflammation with the formation of a pathological cavity filled with pus.
B	Pustule	2	Purulent inflammation of adjacent groups of hair follicles and sebaceous glands.
C	Abscess	3	Accumulation of pus in a small area of the malpighian layer of the skin.
G	Carbuncle	4	Purulent inflammation of the hair bulb and sebaceous gland, surrounded by a capsule of fibroblasts.

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A4B3C1D2.

Task 10.

Read the text and make a match.

Establish a correspondence between the mechanisms of development of skin edema and their etiological factors. For each position given in the left column, select the corresponding position from the right column.

	Type of edema		Etiological factors
A	Oncotic	1	Heart failure
B	Hydrodynamic	2	Nephritis
C	Osmotic	3	Hunger
D	Membranogenic	4	Inflammation

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A3B1C2D4.

GPC-2 ID-3 To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

Closed - type tasks for establishing a sequence

Task 11.

Read the text and set the sequence.

Arrange the stages of proliferation in chronological order. Write down the numbers in the correct sequence.

1. differentiation of fibroblasts;
2. reproduction of fibroblasts;
3. formation of a demarcation wall;

Answer: 2,3,1.

Task 12.

Read the text and set the sequence.

Arrange the sequence of terminal states in the correct order. Write down the numbers in the correct sequence.

1. clinical death;
2. preagonia
3. biological death;
4. agony.

Answer: 2,4,1,3

Task 13.

Read the text and set the sequence.

Arrange the stages of allergic reactions in chronological order. Write down the numbers in the correct sequence.

1. pathochemical;
2. immunological;
3. pathophysiological

Answer: 2,1,3.

Task 14.

Read the text and set the sequence.

Arrange the sequence of studying the sections of pathological physiology. Enter the correct answer numbers in chronological order:

1. experimental pathological physiology;
2. pathological physiology of organs and systems;
3. typical pathological processes;
4. nosology.

Answer: 4,3,2,1.

Task 15.

Read the text and set the sequence.

Specify the sequence of types of exudative inflammation in the order of aggravation of the pathological process. Enter the correct answer numbers in chronological order:

1. purulent;
2. serous;
3. catarrhal;
4. fibrinous;
5. ichorosis.

Answer: 2,3,1,4,5

OPEN-TYPE TASK

Task 16.

Read the task text and write down a detailed, reasonable answer.

Expand the concept of the Zakhar'in-Ged zone. Write down a detailed, well-reasoned answer.

Answer: certain areas of the skin and subcutaneous tissue, in which reflected pain, as well as pain and temperature hyperesthesia often appear in diseases of internal organs.

Task 17.

Read the task text and write down a detailed, reasonable answer.

Give the concept of "paralysis". List and describe the types of central paralysis.

Answer: paralysis is a complete violation of the motor function of the nervous system. Hemiplegia - paralysis of the half of the body opposite the site of damage in the central nervous system; monoplegia — paralysis of one limb; paraplegia-simultaneous paralysis of both thoracic or pelvic limbs; diplegia – a combination of right-and left-sided hemiplegia (2 sources of damage in the central nervous system); tetraplegia — paralysis of all four limbs.

Task 18.

Read the text and write down a detailed, reasoned answer.

List the stages of fever and describe them.

Answer: **Stage 1-the stage** of temperature increase increases the production of heat in the animal body and at the same time its release to the external environment is limited. There is a shift in the setting, genetically defined reference point of thermoregulation; **stage 2 - the stage of standing at high body temperature,** which is provided by increased heat production, balanced by equally intense heat output.

At this stage, temperature homeostasis does not depend on fluctuations in the ambient temperature. The body retains the ability to respond adequately through urgent adaptive responses to sudden changes in ambient temperature or fluctuations in heat production under stress that is not associated with fever; **stage 3 - the stage of lowering body temperature.** Heat production in the animal's body is limited, as pyrogens are gradually excreted through the kidneys. Heat loss increases-peripheral blood flow increases, skin temperature rises, sweating increases. Shortness of breath becomes more intense, accompanied by additional heat output by increased evaporation of moisture from the mucous membranes of the respiratory tract.

Task 19.

Read the text and give a detailed reasoned answer

Expand the concept of "ileus" and list its types.

Answer: ileus - intestinal obstruction, accompanied by a violation of the motor-evacuation function.

Select:

1) dynamic ileus - a functional disorder of the neuromuscular apparatus of the intestinal wall.

- *spastic* - with intestinal spasm;
- *paralytic* - for intestinal paralysis;

2) mechanical ileus:

- *obturation* - infringement, blockage of the intestinal lumen by bezoars, compacted contents (chemo -, coprostasis), intestinal stones, parasites, edematous tissue in inflammation, tumors.
- *strangulation* - twisting of the intestinal loop, invagination, etc.;

3) hemostatic – as a result of thrombosis or embolism with impaired blood circulation of the intestinal loop.

Task 20.

Read the text and write down a detailed, reasoned answer.

List the types of anemia by the ability of the bone marrow to regenerate.

Answer: hyporegenerative – erythropoiesis is reduced; hyperregenerative-erythropoiesis is increased; aregenerative-erythropoiesis stops; diserythropoietic – erythropoiesis is not effective. Red blood cells are formed damaged or die before reaching their maturity.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

CLOSED-TYPE TASKS

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

Task 1.
Read the text and choose the correct answer.
Stopping breathing is:
1. dyspnoea
2. polypnea;
3. hypopnea;
4. Sleep apnea.
Answer: 4

Task 2.
Read the text and choose the correct answer.
Parorexia is:
1. perversion of appetite;
2. eating feces;
3. gluttony;
4. refusal of feed.
Answer: 1

Task 3.
Read the text and choose the correct answer.
Complication of traumatic reticulopericarditis:
1. mitral valve insufficiency of the heart;
2. cardiac tamponade;
3. jaundice
4. tympania of the scar.
Answer: 2.

Tasks of a combined type with a choice of several correct answers from the suggested options

Task 4.
Read the text and choose the correct answers.
What does the Selye Triad include?
1. metabolic disorders and changes in peripheral blood;
2. formation of ulcers in the gastrointestinal tract;
3. increased production of thyroid-stimulating hormone;
4. hypertrophy of the adrenal cortex, thymic involution;

5. inflammatory processes in the internal organs.
Answer: 1,2,4.

Task 5.
Read the text and choose the correct answers.
Differences between a tumor and normal tissue:
1. uncontrolled growth;
2. inflammatory process;
3. atypism.
4. the ability to metastasize;
5. edema.
Answer: 1,3,4.

Closed-type compliance tasks

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

Task 6.
Read the text and make a match.
Establish a correspondence between the forms of radiation sickness and the radiation dose: for each position in the first column, select the corresponding position from the second column.

Forms of radiation sickness		Radiation doses	
A	Toxemic	1	To 10 Gy
B	Bone-marrow	2	20-80 Gy
C	Intestinal	3	More than 80 Gy
D	Cerebral	4	10-20 Gy

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A2B1C4D3

Task 7.
Read the text and make a match.
Establish a correspondence between organs and tissues depending on the possibility of proliferation of organ-specific cellular elements: for each position in the first column, select the corresponding position from the second column.

Ability to regenerate		Organs and tissues	
A	Organs and tissues with active proliferation	1	Tooth enamel, heart muscle, skeletal muscle.
B	Organs and tissues where organ-specific cellular elements are not capable of regeneration	2	Bone tissue, tendons, ligaments.
C	Tissues with limited regenerative abilities	3	Epithelium of the skin, respiratory tract, and gastrointestinal tract is found in tissues with limited regenerative

			abilities.

Write down the selected numbers under the corresponding letters in the table.

A	B	C

Answer: A3B1C2.

Task 8.

Read the text and make a match.

Establish a correspondence between the type of hypersensitivity reaction and their characteristic name: for each position in the first column, select the corresponding position from the second column.

	Type of hypersensitivity reaction		Name
A	Hypersensitivity reaction type I	1	Sensitized T-cell mediated
B	Hypersensitivity reaction type II	2	Immunocomplex
C	Hypersensitivity reaction type III	3	Anaphylactic reactions
D	Hypersensitivity reaction type IV	4	Cytotoxic reactions

Write down the selected numbers under the corresponding letters in the table.

A	B	C	D

Answer: A3B4C1D2

Task 9.

Read the text and make a match.

Find a match between the group and the type of adrenal hormones: for each position in the first column, select the corresponding position from the second column:

	Group		Type
A	Androgens	1	Aldosterone
B	Mineralocorticoids	2	Progesterone
C	Glucocorticoids	3	Epinephrine
D	Catecholamines	4	Cortisol

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A2B1B4D3.

Task 10.

Read the text and make a match.

Establish a correspondence between the name of the fever and the daily temperature fluctuation in stage 2. For each position given in the left column, select the corresponding position from the right column.

	Title		Daily temperature fluctuations
A	Intermittent type	1	Body temperature rises are observed after long (weeks, months) periods of normalization.
B	Fever of laxative type	2	The increase in body temperature naturally alternates with one -, two -,

			three-day periods of normal temperature.
C	Fever of constant type	3	Daily fluctuations in the standing stage of 1.5-2°C.
D	Recurrent fever	4	Daily temperature changes in the second stage within one degree.

Write down the selected numbers under the corresponding letters:

A	B	C	D

Answer: A2B3B4D1.

Closed - type tasks for establishing a sequence

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

Task 11.

Read the text and set the sequence.

Arrange the stages of metastasis in the correct sequence. Write down the numbers in the correct sequence.

1. Angiogenesis – formation of vessels for feeding new tumor nodes;
3. Spread with the flow of blood (or lymph) to distant organs – liver, lungs, bones;
2. Detaching a group of cells from the tumor node;
4. Penetration of cancer cells by perforating the basal membranes of nearby tissues into the bloodstream (hematogenic pathway), peritoneum or lymphatic vessels (lymphogenic pathway).

Answer:2,4,3,1.

Task 12.

Read the text and set the sequence.

Arrange the periods of development of asphyxia in chronological order. Write down the numbers in the correct sequence.

1. Exhaustion of the nerve centers, sharp depression of the respiratory center, dilated pupils, muscle relaxation, a critical drop in blood pressure, a rare and strong pulse – respiratory paralysis;
2. Complete respiratory arrest, heartbeat is preserved, resuscitation is possible;
3. CO 2 accumulates in the blood$_2$ -irritation of the respiratory and vasomotor centers, inspiratory shortness of breath develops;
4. Increased irritation *of n. vagus* – breathing slows down, blood pressure and pulse decrease, expiratory shortness of breath develops;

Answer: 3,4,1,2.

Task 13.

Read the text and set the sequence.

Arrange the biological effects of UV rays in chronological order, depending on the wavelength, starting with the largest one. Write down the numbers in the correct sequence.

1. Stimulation of metabolic and trophic processes, increased resistance to infectious factors, antirachitic effect;
2. Pronounced bactericidal effect, can cause photochemical burn;
3. The effect of tyrosine transformation into melanin.

Answer: 3,1,2.

Task 14.

Read the text and set the sequence.

Arrange the stages of the stress response in chronological order. Enter the correct answer numbers in chronological order:

1. exhaustion;
2. resistance;
3. alarms.

Answer: 3,2,1.

Task 15.

Read the text and set the sequence.

Arrange the phases of pigment metabolism in chronological order. Enter the correct answer numbers in chronological order:

1. formation of indirect bilirubin;
2. hemolysis of red blood cells;
3. formation of stercobilinogen;
4. formation of direct bilirubin;
5. formation of urobilinogen.

Answer: 2,1,4,5,3.

OPEN-TYPE TASK

Task 16.

Read the task text and write down a detailed, reasonable answer.

Discover the concept of "dyspepsia"

Answer: Dyspepsia *is* an acute disease of newborns, characterized by a disorder of the gastrointestinal tract, leading to metabolic disorders and intoxication of the body.

Task 17.

Read the task text and write down a detailed, reasonable answer.

List the forms of gastric secretion.

Answer: hyperacid, asthenic, inert, subacid, achlorhydria.

Task 18.

Read the text and write down a detailed, reasoned answer.

List what causes the damaging effect of electric current.

Answer: frequency of alternating current; voltage; current strength; resistance of animal tissues; duration of action on the body; specific and individual sensitivity of the animal; pathways.

Task 19.

Read the text and give a detailed reasoned answer

List the local signs of inflammation.

Answer: redness, swelling, pain, fever, impaired function.

Task 20.

Read the text and write down a detailed, reasoned answer.

List the types of compensatory reactions.

Answer: working (compensatory), vicar (substitutive), friendly, exchange, regenerative.

4.3. Typical Tasks for Intermediate Qualification

4.3.1. Questions for test

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

1. Concept of reactivity, its types, evaluation criteria.
2. Concept of resistance.
3. Concept of barriers. Classification of barriers.
4. Skin barrier properties.
5. Barrier properties of mucous membranes.
6. Barrier properties of the liver and kidneys.
7. Placental and blood-brain barriers.
8. The concept of compensation, its types.
9. Humoral and cellular defense mechanisms of innate and adaptive immunity.
10. Cell cooperation in the immune response.
11. Sanogenesis.
12. Types of compensatory reactions.

13. Stages of compensatory-adaptive reactions.
14. Regeneration and its types.
15. Decompensation.
16. Common causes of illness and conditions limiting or exacerbating the effect of the cause.
17. General pathogenesis. The main pathogenetic mechanisms of the occurrence of diseases.
18. The main link in pathogenesis.
19. Specific and non-specific links of pathogenesis.
20. Relationship of local and general changes in the body.
21. Vicious circle.
22. Causal relationships in an organism's response to a pathogenic factor.
23. The concept of health and disease.
24. Periods of illness. Disease outcomes.
25. The main forms of the course of the disease.
26. The history of the development of science about the causes and conditions of the onset of the disease.
27. The concept of death.
28. What is resuscitation. When it is possible.
29. What is hypobaria? Pathogenesis.
30. Hypoxia. Concept. Types of hypoxia.
31. Compensatory mechanisms arising from mountain and altitude sickness.
32. What is hyperbaria? Pathogenesis.
33. Local effect of electric current on the animal body.
34. The general effect of electric current on the animal body.
35. Mechanism of laser action on the body.
36. Local and general effect of ultraviolet rays on the body.
37. What is clover disease? Mechanism of its development.
38. Mechanism of direct and indirect ionizing radiation damage.
39. Radiosensitivity of tissues and cells.
40. Acute radiation sickness.
41. Chronic radiation sickness.
42. Local effect of low temperatures on the body, stages of freezing.
43. What is hypothermia? Pathogenesis.
44. Theories of colds.
45. Burn shock and collapse.
46. Burn disease.
47. What is hyperthermia? Pathogenesis.
48. Heat and sunstroke.
49. Effects on the body of visible light. Desynchronoses.
50. Effect on the body of radio waves.
51. What is arterial hyperemia?
52. Signs of arterial hyperemia.
53. Types of arterial hyperemia.
54. Consequences of arterial hyperemia.
55. What is venous hyperemia?
56. Signs of venous hyperemia.
57. Types of venous hyperemia.
58. Consequences of venous hyperemia?
59. What is ischemia. Signs of ischemia.
60. Types of ischemia.
61. Consequences of ischemia.

62. What is a heart attack? Pathogenesis.
63. Varieties of heart attacks.
64. Bleeding is a concept, types of bleeding by the way the blood leaves the blood vessels.
65. Hemorrhages - concept, types. Compensatory mechanisms in the body during blood loss.
66. Thrombosis is a concept, the main causes of thrombus formation.
67. Types of thrombus by the nature of the location in the vessels.
68. Mechanism of thrombus formation.
69. Outcomes of thrombosis.
70. What is an embolism? Types of emboli.
71. What is swelling and dropsy? Describe the etiology, pathogenesis, consequences.
72. The concept of inflammation. What is the biological significance of this reaction for the body?
73. Causes and signs of inflammation. Theories of inflammation.
74. Inflammation focus formation. Microcirculation disorder and vascular disorders in it.
75. Exudation and emigration in inflammation. Phagocytosis.
76. Features of the development of inflammation in different species of animals.
77. Inflammatory mediators.
78. Fever. Definition of the concept.
79. Etiology of fever.
80. Stages of fever.
81. Pathogenesis of fever.
82. The state of the main functions of the body in fever.
83. Disorders of carbohydrate, fat, protein metabolism during fever.
84. The role of the nervous and endocrine systems in the pathogenesis of febrile response.
85. Types of temperature curves.
86. Classification of fever by degree of fever.
87. Features of fever reaction in various species of farm animals.
88. Fever value for the body
89. Tumors. Biological features and classification.
90. Etiology of tumor growth. What theories explain scientists blastomogenesis?
91. Pathogenesis of tumor growth.
92. Forms of atypism characteristic of tumor cells.
93. Differences between benign and malignant tumors.

Questions for exam

Competencies to be formed:

GPC-1. Is able to determine the biological status, normal clinical signs of organs and systems of the animal body.

GPC-1 ID-1 To know: safety precautions and personal hygiene rules during the examination of animals, methods of its fixation; schemes of clinical examination of an animal and the procedure for examination individual body systems; methodology for diagnosis of the pathological process.

GPC-1 ID-2 To be able to: collect and analyze anamnesis data, conduct laboratory and functional studies, necessary to determine the animal biological status.

GPC-1 ID-3 To possess practical skills: for conducting on its own a clinical examination of an animal, using classical research methods and digital technologies.

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of

animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.

GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

1. Subject and tasks of pathophysiology. The main stages of the development of domestic pathophysiology.
2. Research methods used in pathophysiology.
3. The concept of the essence of health and disease. Evolution of disease perceptions.
4. Essence of the terms "pathological reaction," "pathological process," "pathological state" and "typical pathological process"
5. Periods and possible disease outcomes. Resuscitation.
6. Terminal states. Dying as a stage process.
7. The history of the development of science about the causes and conditions of the onset of the disease. Concept of general etiology.
8. Exogenous and endogenous causes of disease.
9. Role of conditions in disease development. What conditions do you know.
10. General etiology. The role of causes and conditions in the occurrence of disease. Etiotropic approach to disease treatment and prevention.
11. Mechanical injury. Types of traumatic injuries.
12. Mechanism of electrocurrent action on cells.
13. General and local effects of electric current on the animal body.
14. Effects of laser radiation and ultraviolet rays on the body.
15. Laser use in veterinary medicine
16. Pathogenesis of acute radiation sickness.
17. Pathogenetic aspects of the effect on the body of high barometric pressure.
18. Pathogenetic aspects and compensatory reactions under the action of reduced barometric pressure on the body.
19. Local effect of high temperatures on the body.
20. Hyperthermia, sunstroke, heatstroke.

21. Local effect on the body of low temperatures.
22. Hypothermia, stages.
23. Theories of colds.
24. General characteristics of chemical etiological factors.
25. The role of biological factors in the origin of animal diseases.
26. The concept of general pathogenesis. Causal relationships in the mechanism of disease development. Vicious circle.
27. The concept of reactivity and resistance of an organism, its types, evaluation criteria.
28. Non-specific factors of body defense.
29. The role of macrophages, T and B immune systems in the body's response to foreign antigen.
30. Role of different classes of immunoglobulins in immune response. Pathogenesis of the immune response.
31. The concept of immunological tolerance.
32. Types of compensatory reactions in the body.
33. What are the causes of direct and mediated cell damage, how do they manifest?
34. Disorders of the function of plasma membranes, mitochondria, lysosomes, cell nucleus.
35. Role of heredity in pathology. Mechanism of occurrence of hereditary diseases.
36. Mutation process in human and animal pathology. Types and significance of mutations. Mutagenic factors.
37. Etiology and pathogenesis of hereditary forms of pathology. Diagnosis of hereditary diseases, the principles of their prevention and possible methods of treatment.
38. The role of constitution and age in pathology
39. Aging of the body. Changes in the body with aging. Theories of aging.
40. Define the concept of "shock," characterize the mechanism of the development of traumatic shock.
41. Mechanism of development and possible consequences of acute vascular insufficiency - collapse.
42. Causes and consequences of arterial hyperemia.
43. Causes and consequences of ischemia.
44. Mechanism of venous hyperemia.
45. Stasis: concept, etiology, pathogenesis, consequences
46. Infarction: pathogenesis, varieties, possible consequences.
47. Characterize bleeding and hemorrhages.
48. Embolism, its causes and consequences. Give examples.
49. Pulmonary embolism
50. Pulmonary embolism
51. Etiology and pathogenesis of thrombus formation, types of thrombi, outcomes of vascular thrombosis.
52. Edema: concept, signs, classification of consequences.
53. Watermark species and their consequences.
54. The concept of inflammation. What is the biological significance of this reaction for the body?
55. Causes and signs of inflammation. Theories of inflammation.
56. Alteration stage in inflammation. Primary and secondary damage. Alteration value.
57. Inflammation focus formation. Microcirculation disorder and vascular disorders in it.
58. Exudation and emigration in inflammation. Phagocytosis.
59. Features of the development of inflammation in different species of animals.
60. Inflammatory mediators.
61. Proliferation stage. Regulation of proliferation in the focus of inflammation.

62. Protective and adaptive significance of inflammation. Interaction of local and common mechanisms.

63. Classification of inflammation by predominant process

64. Fever. Concept, etiology and pathogenesis. Stages of fever.

65. Classification of fevers.

66. Give a description of the functioning of vital organs and systems in fever.

67. Biological significance of febrile reaction.

68. Tumors. Biological features and classification.

69. Etiology of tumor growth. What theories explain scientists blastomogenesis?

70. Pathogenesis of tumor growth.

71. Forms of atypism characteristic of tumor cells.

72. Differences between benign and malignant tumors.

73. Disturbances of energy and basic metabolism in animals.

74. Carbohydrate metabolism disorders. Genesis and sequelae of diabetes mellitus.

75. Fat metabolism disorders.

76. Protein metabolism disorders.

77. What causes can lead the body to dehydration? What changes occur in the dehydrated body, why are they dangerous?

78. What is swelling? Classification of edema by pathogenesis.

79. Classification of edema by etiology.

80. What is dropsy? Describe the etiology, pathogenesis, consequences.

81. Fasting (complete, incomplete, partial).

82. Protein starvation.

83. Carbohydrate fasting.

84. Fat starvation.

85. What changes occur in the body with a lack of macronutrients (Ca, P, Mg, K, Na, Cl)?

86. What changes occur in the body with a lack of trace elements (Fe, J, Co, Cu, Mn, Zn, Se).

87. Disorders in the body caused by a lack of water-soluble and fat-soluble vitamins.

Competencies to be formed:

GPC-2. Is able to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological status of the animal body.

GPC-2 ID-1

To know: ecology factors of the environment, its classification and the nature of relationships with living organisms; basic ecological concepts; interspecific relations of animals and plants, terms and bio ecology laws, parasites and hosts; ecological features of some types of pathogenic microorganisms; mechanisms of influence of anthropogenic and economic factors on the animal body.

GPC-2 ID-2

To be able to: use environmental factors and environmental laws in agricultural manufacture; apply the achievements of modern microbiology and ecology of microorganisms in animal husbandry and veterinary medicine in order to prevent infectious and invasive diseases and treat animals; use environmental monitoring methods in the environmental assessment of agricultural facilities and the production of agricultural products; assess the impact on the animal body, anthropogenic and economic factors

GPC-2 ID-3

To possess skills of: the knowledge of the origin of living organisms, the levels of organization of living matter, favorable and unfavorable factors affecting the body; the basis for studying environmental knowledge of the environment, the laws of the development of nature and society; skills of observation, comparative analysis, historical and experimental modeling of the impact of anthropogenic and economic factors on living objects, with the use of digital technologies as well.

GPC-4. Is able to use methods to solve problems, using modern equipment for the development of new technologies in professional activity and use modern professional methodology to conduct experimental research and interpret the results.

GPC-4 ID-1 To know: the technical capabilities of modern specialized equipment, methods of problems resolution in professional activity.

GPC-4 ID-2 To be able to: apply modern technologies and research methods in professional activities, interpret the results obtained.
GPC-4 ID-3 To possess skills of: the work with specialized equipment for implementation of the set tasks for research and the development of new technologies, digital ones, as well.

1. What can be a violation of the volume of circulating blood?
2. Describe the classification of anemias, analyze the symptoms and compensatory reactions in anemia.
3. Characterize individual forms of pathological leukocytosis.
4. Leukopenia. Species. Etiology, pathogenesis of various types of leukopenia. Significance of leukopenia.
5. What is leukemia, what are its varieties and features characteristic of each of them?
6. Neutrophilia. The concept of the shift of the neutrophil nucleus left and right.
7. Pathophysiology of the cellular component of the hemostasis system.
8. Causes and consequences of cardiac tamponade. Acute vascular insufficiency.
9. Causes of myocardial infarction, possible consequences. Myocardial hypertrophy.
10. Etiology and pathogenesis of myocarditis.
11. Etiology and pathogenesis of myocardiodystrophy.
12. Etiology and pathogenesis of cardiosclerosis.
13. Arrhythmias that occur when conduction and contractility functions are impaired.
14. Arrhythmias that occur when the functions of automatism and excitability are impaired.
15. Cardiac form of circulatory failure. Pathological and compensatory changes in cardiac activity.
16. Hypertension, types. Pathogenesis of blood pressure dysregulation in symptomatic hypertension.
17. Hypertension. Etiology, pathogenesis, significance for the pathology of various body systems.
18. Malformations of the right half of the heart.
19. Defects of the left half of the heart.
20. Compensatory changes in heart defects (hypertrophy and dilation).
21. Atherosclerosis. Etiology and pathogenesis of this disease.
22. General characterization of immune system pathology.
23. What causes can cause an allergic reaction, what is the stage of its development?
24. Analyze changes in the body inherent in immediate hypersensitivity.
25. Allergic reactions of type I (anaphylactic), features of the immunological, biochemical and pathophysiological stages. Anaphylactic shock.
26. Allergic reactions of type II (cytotoxic type), features of the immunological, biochemical and pathophysiological stages.
27. Allergic reactions of type III (reactions of immune complexes), features of the immunological, biochemical and pathophysiological stages.
28. Allergic reactions of type IV (GRT), features of the immunological, biochemical and pathophysiological stages.
29. The use of delayed-type hypersensitivity reactions in the diagnosis of infectious and invasive diseases.
30. Autoimmune pathology. Causes and mechanism of its development.
31. Immunodeficiency states. Etiology and types of immunodeficiencies. Violation of immunobiological reactivity in defects of the cellular and humoral links of immunity, phagocytic system and complement.
32. Lymphoproliferative diseases. Causes and types.
33. How can the frequency, depth, frequency of respiratory movements in the pathology condition change?
34. Characterize respiratory disorders.

35. Pneumothorax (definition, classification, concomitant changes in the body). Concept of asphyxia.

36. Hypoxia, types, characteristics, consequences.

37. Impaired diffusion of gases in the lungs, etiology and pathogenesis, examples of diseases.

38. Impaired lung perfusion, etiology and pathogenesis. Pulmonary embolism, pulmonary edema.

39. What etiological factors can cause digestive diseases?

40. Causes of appetite and thirst disorders.

41. Disorders of oral digestion, the act of swallowing, salivation and transport through the esophagus.

42. Characterize digestive disorders in ruminant pre-stomachs.

43. Tympania in ruminants. Pathogenesis of this disease.

44. Traumatic reticulitis. What are the consequences.

45. Determine the relationship between disorders of the secretory and motor functions of the stomach and intestines.

46. Malabsorption syndrome.

47. Peptic ulcer of the stomach and duodenum. Etiology and pathogenesis.

48. Hyperacidal, hypoacid and anacid gastritis.

49. Characterize different types of ileus.

50. Jaundice, types and consequences.

51. Characterize subhepatic jaundice.

52. Characterize hepatic jaundice.

53. Characterize adrenal jaundice.

54. Methods for studying liver function.

55. Disorders of the main functions of the liver.

56. Role of the liver in metabolic pathology.

57. Impaired antitoxic liver function.

58. Etiology and pathogenesis of hepatitis.

59. Etiology and pathogenesis of hepatosis.

60. Describe the causes, pathogenesis and consequences of cholelithiasis.

61. List the extrarenal and renal factors of diuresis disorders.

62. Causes and consequences of anuria, oliguria, and polyuria.

63. Pathological constituents in urine, their origin and diagnostic value.

64. What is the difference between nephrosis and nephritis? Describe their effects on the body.

65. Pyelonephritis. Etiology, pathogenesis, consequences.

66. Acute renal failure. Etiology, pathogenesis of disorders of the excretory and homeostatic functions of the kidneys.

67. Chronic renal failure. Etiology and pathogenesis of disorders of the excretory and homeostatic functions of the kidneys.

68. Uremia: concept, species, pathog

69. Uremia: concept, types, pathogenesis, consequences.

70. Role of kidneys in blood pressure regulation. Renal hypertension.

71. What is urolithiasis? What are the causes of this disease, its general pathogenesis and consequences?

72. General etiology and pathogenesis of disorders of the endocrine regulation of the body.

73. Dysfunction of the hypothalamic-pituitary system.

74. Impaired pituitary function.

75. Adrenal dysfunction.

76. Outline the essence of G. Selye's concept of stress (adaptation syndrome).

77. Thyroid dysfunction.

78. Parathyroid dysfunction.

79. Pancreatic increer dysfunction.
80. When and how does the hypofunction and hyperfunction of gonads of male and female animals manifest?
81. Epiphysis dysfunction.
82. Thymic dysfunction.
83. General etiology and general pathogenesis of nervous system disorders.
84. Disorders of the motor function of the nervous system.
85. Disorders of the sensitive function of the nervous system.
86. Disorders of trophic function of the nervous system.
87. What is the role and significance for the body of feeling pain?
88. Violation of GNI, neurosis.

5. METHODOLOGICAL MATERIALS DEFINING THE PROCEDURES FOR ASSESSING KNOWLEDGE, SKILLS AND ABILITIES AND WORK EXPERIENCE CHARACTERIZING THE STAGES OF COMPETENCE FORMATION

Criteria for assessing the knowledge of students during the colloquium:

- Mark "**excellent**" - the student clearly expresses his point of view on issues under consideration, giving relevant examples.
- Mark "**good**" - the student makes individual errors in the answer
- The mark "**satisfactory**" - learner detects knowledge gaps basic educational and normative material.
- The mark "**unsatisfactory**" - the student detects significant gaps in knowledge of the main provisions of the discipline, inability to use teacher get the correct solution to a specific practical problem.

Criteria for assessing the knowledge of students during testing:
The test result is evaluated on a percentage rating scale. Each student is offered a set of test tasks of 25 questions:

- The mark "**excellent**" is 25-22 correct answers.
- The mark "**good**" is 21-18 correct answers.
- The mark "**satisfactory**" is 17-13 correct answers.
- The mark "**unsatisfactory**" is less than 13 correct answers

Criteria for assessing students' knowledge during report:

- The mark "**excellent**" - the problem is identified and its relevance is justified; an analysis of various points of view on the problem under consideration is made and one's own position is logically stated; conclusions are formulated, the topic is fully disclosed, the volume is maintained; the requirements for external design are met, the basic requirements for the report are fulfilled.
- The mark "**good**" - mistakes have been made. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the report is not maintained; there are omissions in the design, there are significant deviations from the requirements for the presentation of materials.
- The mark "**satisfactory**" - the topic is only partially covered; factual errors were made in the content of the report; there are no conclusions, the topic of the report is not disclosed.
- The mark "**unsatisfactory**" - there is a significant misunderstanding of the problem or the report is not submitted.

Criteria of knowledge during the test:

- The mark "**accepted** " must correspond to the parameters of any of the positive ratings ("excellent", "good", "satisfactory").
- The mark "**not accepted** " rating should correspond to the parameters of the "unsatisfactory" rating.
- The mark "**excellent**" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed.
- The mark "**good**" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be made.
- Mark "**satisfactory**" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills is manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations. –
- The mark "**unsatisfactory**" – the types of educational work provided for in the curriculum have not been completed. demonstrates incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge, skills, and skills is manifested for a large number of indicators, the student experiences significant difficulties in operating knowledge and skills when transferring them to new situations

Criteria of knowledge during the exam:

- The mark "**excellent**" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in situations of increased complexity. At the same time, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be allowed.
- The mark "**good**" – all types of educational work provided for in the curriculum have been completed. The student demonstrates the compliance of knowledge, skills, and abilities with the indicators given in the tables, operates with acquired knowledge, skills, and applies them in standard situations. At the same time, minor errors, inaccuracies, difficulties in analytical operations, transfer of knowledge and skills to new, non-standard situations may be made.
- Mark "**satisfactory**" – one or more types of educational work provided for in the curriculum have not been completed. The student demonstrates incomplete compliance of knowledge, skills, and abilities with the indicators given in the tables, significant errors are made, a partial lack of knowledge, skills, and skills is manifested in a number of indicators, the student experiences significant difficulties in operating with knowledge and skills when transferring them to new situations. –
- The mark "**unsatisfactory**" – the types of educational work provided for in the curriculum have not been completed. demonstrates incomplete compliance of knowledge, skills, and abilities given in the tables of indicators, significant errors are made, a lack of knowledge,

skills, and skills is manifested for a large number of indicators, the student experiences significant difficulties in operating knowledge and skills when transferring them to new situations

6. ACCESSIBILITY AND QUALITY OF EDUCATION FOR DISABLED PEOPLE

If necessary, persons with disabilities and persons with disabilities are given additional, time to prepare an answer for the test.
When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities, their own technical means can be used.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline provides for the provision of information in forms adapted to the limitations of their health and perception of information:

For people with visual impairments:	– in printed form in enlarged font; – in the form of an electronic document.
For people with hearing impairments:	– in printed form; – in the form of an electronic document.
For people with disorders of the musculoskeletal system:	– in printed form, the device; – in the form of an electronic document.

When conducting the procedure for evaluating the learning outcomes of disabled people and persons with disabilities in the discipline, it ensures that the following additional requirements are met, depending on the individual characteristics of the students:

a) instructions on the procedure for conducting the assessment procedure are provided in an accessible form (orally, in writing);

b) an accessible form of assignment of assessment tools (in printed form, in printed form in enlarged font, in the form of an electronic document, assignments are read out by the teacher);

c) an accessible form of providing answers to tasks (written on paper, a set of answers on a computer, orally).

If necessary, for students with disabilities and the disabled, the procedure for evaluating the results of training in the discipline can be carried out in several stages.

The procedure for evaluating the learning outcomes of disabled people and persons with disabilities is allowed using distant learning technologies.