SEM V

Name of the programme module	Microbiology 2
Programme module type (obligatory/optional)	obligatory
Year of studies for a given field	III
Term for a given field	V
ECTS credits together with contact/no contact hours division	7 (3.1/3.9)
A unit providing the course	Division of Veterinary Microbiology
Module objective	Acquainting students with the specific knowledge of morphology, physiology, biological properties, features of pathogenicity in microbes that cause diseases in animals (bacteria, fungi, viruses) and its theoretical and practical implementation in microbial diagnostics
Educational results	Knowledge: Detailed knowledge of morphology and physiology of microbes that are potentially pathogenic to animals. Knowledge of relationship of the environment and the microbes that inhabit it. Detailed knowledge of techniques to isolate and identify microbial groups. Detailed knowledge of how microbes interact with macroorganisms (animals).
	Skills: Ability to seek, comprehend, analyse and creatively implement the information on microbiology from various literature sources. Ability to accurately verbalise knowledge in oral and written form. Ability to single-handedly carry out, analyse and evaluate a given diagnostic procedure and interpret the results obtained. Ability to duly select proper laboratory techniques for microbial identification and breeding, and the ability to identify the microbes that are adverse to animal health
	Social competence: Ability to cooperate and work in a group. Awareness of the social, professional and ethical responsibility for the health of animals. Knowledge of procedures necessary to restrict microbial influence on animal health Awareness of the need to permanently broaden the knowledge of how microbes interact with the animal organism.
Content of the programme module	Detailed microbiology – microbes that are adverse to animal health:Bacteria: *E.coli, Salmonella, Yersinia, Pasteurella, Bacillus, Clostridium, Erysipelotrix, Listeria, Mycobacterium, Mycoplasma, Streptococcus, Staphylococcus, Brucella.* Fungi: *Trichophyton, Microsporum, Candida, Malassezia, Cryptococcus, Aspergillus, Mucor, Fusarium.* Viruses: Family Rodzina *Parvoviridae, Herpesviridae, Picornaviridae, Paramyxoviridae, Rhabdoviridae* Phenotypic traits of microbes (species, representatives) including the agents responsible for virulence and pathogenicity of the infection – detailed procedures used in detailed microbial diagnostics
Planned didactic forms/actions/methods	Lecture, performing diagnostic analyses in bacteriology, virology and mycology, multimedia presentations, discussions

Name of the programme module	Veterinary Pharmacy
Programme module type (obligatory/optional)	Obligatory
Year of studies for a given field	III
Term for a given field	5
ECTS credits together with contact/no contact hours division	2 (1/1)
A unit providing the course	Institute of Pharmacology, Department of Veterinary Preclinical Sciences, Faculty of Veterinary Medicine, University of Life Sciences in Lublin
Module objective	Acquisition of knowledge and skills in the field of Veterinary pharmacy
Educational results	Knowledge: Knowledge of possible drug interactions inside and outside an organism. Knowledge of different drug formulations and modern forms of veterinary medicines. Ability to name the advantages and disadvantages of respective drug formulations. Ability to name the advantages of the application of probiotics and feed enzymes.
	Skills: Ability to prepare basic drug formulations. Exercises in correct prescription issuance. Ability to evaluate the possibilities of adverse effects and interactions when combination therapy is implemented. Ability to seek, comprehend, analyse and creatively implement the necessary information from various literature sources.

	Social competence: Understanding the importance of lifelong learning, ability to inspire and organise learning processes for others. Awareness of the social, professional and ethical responsibility for the welfare of animals and the shaping of their environment. Ability to predict the effects of a doctor's activity within the protection of public health, as well as the ability to take actions to minimise risks. Ability to cooperate and work in a group assuming various roles.
Content of the programme module	Lectures: 1. Modern forms of veterinary medicines; 2. Interactions of veterinary medicines; 3. Interactions of medicines with food; 4. Pharmacokinetics of medicines at different stages of pathology; Tutorials 1. Pharmacokinetic and pharmacodynamic interactions of medicines; 2. Disinfection and disinfectants; 3. Polish Pharmacopoeia; 4. Non-conventional treatment – homeopathy, herbal treatment; 5. Veterinary medicine formulations – pills, ointments, solutions; 6. Practical preparation of respective drug formulations; 7. Analytical methods of veterinary medicines testing; 8. Probiotics and feed enzymes.
Planned didactic forms/actions/methods	Lecture, multimedia presentations, laboratory class report, discussion, experiment, project execution,

Name of the programme module	Public Health Care in Emergencies
Programme module type (obligatory/optional)	Obligatory
Year of studies for a given field	III
Term for a given field	V
ECTS credits together with contact/no contact hours division	2 (1/1)
A unit providing the course	Department of Hygiene of Food of Animal Origin
Module objective	Acquainting students with hazards, methods of their prevention and minimalizing their effects, as well as the methods of appropriate responding in crisis situations related to veterinary supervision over public health
Educational results	Knowledge: Knowledge of legal bases and basic definitions concerning the protection of public health. Knowledge of the principles of functioning and the tasks of the Veterinary Institute as regards public health. Knowledge of the most important biological, chemical and radiation hazards for public health and the methods of addressing these hazards.
	Skills: Ability to reasonably interpret social responsibility of veterinary doctors as regards veterinary care of public health. Ability to implement contingency plans as standard procedures in the occurrence of a crisis situation. Ability to take measures in the occurrence of crisis situations for which procedures have not been yet drawn up.
	Social competence: Understanding the need for continuing education in connection with the progress of science and technological advancement. Awareness of the responsibility for the safety of public health and the ability to cooperate with the representatives of other professions when implementing tasks connected with public health.
Content of the programme module	1. The role and tasks of the state in the implementation of public health protection – legal acts. 2. Factors of biological weapons and methods of minimizing the effects of bioterrorist attacks. 3. The tasks of Veterinary Inspection under Public Health Care Emergencies. 4 Biological and chemical hazards for public health care. 5. Quality and safety of food schemes (including water). 6. Basic principles of radiation and radioactivity, effects of radiological emergency and protection against radioactivity to people, animals and food.
Planned didactic forms/actions/methods	lectures, laboratory classes

Name of the programme module	Pathophysiology
Programme module type (obligatory/optional)	Obligatory
Year of studies for a given field	III
Term for a given field	V and VI
ECTS credits together with contact/no contact hours division	6 (3.78/2.22), 5 (3/2)
A unit providing the course	Department of Veterinary Preclinical Sciences, Institute of Pathophysiology
Module objective	Acquainting students with etiology and pathomechanisms of diseases. Students acquire the necessary knowledge and practical skills as regards systemic response of the organism (e.g. disease, inflammation, stress, atherosclerosis, acid/base imbalance,

	repair, ageing), pathological effect of physical, chemical and biological factors in respective animal species and the pathogenesis of animal diseases at the molecular, cellular, organ and systemic level with the consideration of a cause-related therapy. Emphasising the need for modelling diseases with the purpose of capturing etiology and changes that give rise to lesions, in such a way as to control and prevent diseases.
Educational results	Knowledge: Ability to characterise and explain basic pathological processes, e.g. inflammation, neoplasm, acid-base imbalance; ability to determine their significance for the course of a disease. Knowledge of, understanding and the ability to interpret the role of signalling molecules and receptor proteins in the pathomechanisms of neoplastic and genetic diseases. Ability to describe, explain and interpret the principles and mechanisms that underlie the occurrence of, free radical and deficiency diseases at the molecular, cellular, organ, systemic level with the consideration of biological mechanisms that ensure recovery.
	Skills: Ability to analyse, evaluate and apply pathogenesis for selecting appropriate cause-related treatment in animal diseases. Ability to perform, analyse and individually interpret the results of laboratory experiments as regards etiology and pathogenesis of animal diseases. Ability to individually apply selected molecular and cellular laboratory techniques and use its results for the analysis of etiology, pathomechanism and cause-related therapy of diseases.
	Social competence: Awareness of the need for lifelong self-improvement and education in connection with constant progress in biomedical sciences. Awareness of the need for targeted education and self-improvement in the field of etiology and pathogenesis of diseases at the molecular level.
Content of the programme module	Endogenous and exogenous aetiological agents which condition pathogenesis of diseases; molecular foundations for inflammatory reaction, processes of repair and regeneration, mechanisms of ageing and longevity, genetic susceptibility and immunity to diseases. Molecular and signalling conditions of neoplasia, pathomechanism of angiogenesis and metastases. Neurohormonal mechanism of stress reaction, cellular response to stress, adaptation and consequences of stress. Value deviations in the anion gap, difference and strong anion gap in the acid-base and water-electrolyte imbalance. Application of changeable values of cationic-anionic difference in animal feed for prophylaxis and therapies of animal diseases. Pathomechanism of arteriosclerosis with the consideration of deviations in metabolism of respective lipoprotein fractions, as well as proteins that influence lipoprotein transformation. Pathomechanism of cardiomyocyte damage in heart failure. Phosphorylation disorders in transmitter and regulating proteins and the changes in the amount of activity of adrenoreceptors in the pathomechanism of dilated cardiomyopathy in dogs. The correlation of neutrophilia, coagulation system and mediators of inflammation in bovine respiratory diseases (BRD) and chronic obstructive pulmonary disease in horses (COPD). The significance of the activeness of cyclic nucleotides and gastrointestinal hormones in the receptor, neuronal and neuroinflammatory mechanisms of secretory diarrhoeas. The participation of trofoallergens in digestive intolerance. Infectious anorexia. Equine and bovine mechanism of autointoxication. Pathomechanisms of pancreatitis and intestinal proliferation. Activation of stellate cells and Kupffer cells in the course of liver fibrosis and cirrhosis. Molecular mechanisms of endocrine disorders. Hormonal and receptor conditions of ovarian cyst development. Genetic and immunological origin as well as receptor immunity in etiopathogenesis of different diabetes types in cats and dogs. Kidney failure, nephrotic and nephritic syndrome.
Planned didactic forms/actions/methods	Lectures, seminars, laboratory classes, practical exercises, demonstrations, multimedia presentations, boards of education (students with outstanding results may work for the Student Scientific Group – Pathophysiology Section – experimental work under the supervision of a researcher and lecturer and the presentation of the work at the International Congresses of Student Scientific Groups, e-learning.

Name of the programme module	Clinical and Laboratory Diagnostics I
Programme module type (obligatory/optional) field	Obligatory
Year of the study programme	III

Semester of the study programme	V
ECTS credits together with contact/no contact hours division	6 (3.0/3.0)
A unit providing the course	Sub-Department of Clinical Diagnostics and Veterinary Dermatology, Faculty of Veterinary Medicine, University of Life Sciences in Lublin, Poland
Module objective	The aim of the module is to familiarise students with the methods for the safe handling of animals and the methods of carrying out the general and detailed clinical examination of particular animal species. The student is supposed to learn about basic clinical concepts and master clinical examination techniques in accordance with the examination plan.
Educational results	Knowledge The student has the knowledge of the methods and the rationale for interview data collection and he or she knows how to handle animals during a clinical examination; knows how to produce the correct description of an animal and how to carry out a general physical examination and a detailed examination of particular systems
	Skills The student is able to ask targeted questions regarding an interview, obtains information from the animal owner and produces the description of an animal; is able to carry out a general clinical examination and the clinical examination of the integumentary, respiratory and circulatory system in particular animal species
	Social competencies The student is able to adjust questions to the intellectual level and the emotional state of the animal owner during an interview; is familiar with the principles of the ethical handling of animals during their examination; is able to cooperate with other veterinary doctors when carrying out professional duties
Content of the programme module	Animal handling during a clinical examination; methods for restraining animals; collecting interview data from animal owners; the current state of an animal; carrying out a general physical examination; habitus assessment; examination of internal body temperature; breath testing; examination of the external integuments; examination of the airways; examination of the chest: visual examination, assessment of dyspnea, palpation, percussion, auscultation; examination of the circulatory system, examination of the heart, peripheral vascular examination, pulse examination
Planned didactic forms/activities/methods	The module includes the following didactic methods: lectures, demonstrations of testing methods and diagnostic techniques, practical classes with multimedia presentations, practical classes involving the presence of companion and farm animals at the Clinic of Internal Diseases

Name of the programme module	Veterinary Pharmacology
Programme module type (obligatory/optional)	Obligatory
Year of studies for a given field	III
Term for a given field	V and VI
ECTS credits together with contact/no contact hours division	5(2.5/2.5), 5(2.5/2.5)
A unit providing the course	Division of Pharmacology
Module objective	Acquainting students with veterinary pharmacology, its mechanism, as well as the pharmacokinetics and pharmacodynamics of drugs.
Educational results	Knowledge: Comprehension of basic concepts from the field of general pharmacology, applying the knowledge of the properties of pharmacokinetic and pharmacodynamic active substances which belong to a class of drugs commonly used in various animal species. Recognition of indications and contraindications for the use of medicines in animals. Understanding of basic concepts from a scope of; Pharmacology of the peripheral and central nervous system; medicines used in the treatment of the diseases of digestive, respiratory, cardiovascular, urinary systems; drugs acting on the uterus and the mastitis; drugs used in bacterial, fungal and protozoan infections. Comprehension of pharmacodynamic and pharmacokinetic drug interactions, factors modifying the pharmacokinetics of drugs.
	Skills: The ability to make an accurate selection of a drug in a given disease entity. Ability to rationally dose medicines. Ability to seek, comprehend, analyse and creatively implement the necessary information from various literature sources. Ability to evaluate the advantages and disadvantages of measures taken to tackle therapeutic problems.

	Social competence: Understanding the importance of lifelong learning, ability to inspire and organise learning processes for others. Awareness of the social, professional and ethical responsibility for the well-being of animals and the shaping of their environment. Ability to predict the effects of a doctor's activity within the protection of public health, as well as the ability to take actions to minimise the risk of using medicines. Ability to cooperate and work in a group assuming various roles
Content of the programme module	Veterinary pharmacology - Pharmacopoeia + ABN list, test prescription, medicinal prescription, narcotic prescription, Latin names for medicines, therapeutic dose, pharmacokinetic parameters. The effect of drugs in the system, mechanism of drugs (indications, contraindications, adverse effects) Drugs: anti-parasitic, anti-neoplastic, antihistamine, applied in the diseases of the urinary and reproductive system. Veterinary Pharmacology – Pharmacotherapy in mastitis, antibiotics and chemotherapeutic agents, test preparations. Medicines for the central nervous system. Medicines for the parasympathetic and sympathetic, respiratory and digestive systems, painkillers. Antihistamines and anti-virals
Planned didactic forms/actions/methods	Lecture, multimedia presentations, films, virtual laboratory, group work/lectures, discussions, demonstrations, conversations, project method, laboratory class report.