Module code	M_WE_SEM6 FARMAK 2
Field of study	Veterinary medicine
Module name, also the name in English	Veterinary pharmacology 2
	Farmakologia weterynaryjna2
Language of instruction	English
Module type	obligatory
Level of studies	Long-cycle master's degree studies
Form of study	Full-time
Year of study in the field of study	III
Semester of study in the field of study	V
ECTS credits, divided into contact/non-contact hours	5 (2,97/2,03)
Academic title/degree, name of the person responsible for the module	Prof. dr hab. Cezary J. Kowalski
Unit teaching the module	Department of Pharmacology, Toxicology and Environmental Protection
Module objective	Familiarisation with the specific pharmacology of drugs acting on organs (characteristics of selected veterinary medicines, representing the specific ACTVet Anatomical Therapeutic Chemical Classification group). Familiarisation with the classification of active ingredients used in animal treatment. Introduction to the fundamentals of veterinary pharmacotherapy (indications, contraindications, adverse effects and basic interactions in each drug group, in various animal species). Familiarisation with chemotherapeutic agents used for treatment of animals, as well as with principles of chemotherapy. Familiarisation with detailed pharmacology of all groups of chemotherapeutics (antibacterial, antiviral, antiparasitic, anticancer), including mechanisms of drug action, mechanisms of resistance, pharmacokinetics, interactions, indications and contraindications, adverse effects, the issues of drug residues in tissues. Improving knowledge related to the correct writing of medical prescriptions. Development of competences in the field of informed and responsible application of knowledge acquired during the course.
The learning outcomes for the module include a description of the knowledge, skills and social competences that the student will gain after completing the module.	Knowledge:
	K1 - Students know the detailed pharmacology of organ drugs for approximately 100 active ingredients and approximately 200 substances belonging to chemotherapeutics, including pharmacodynamics, pharmacokinetics, adverse effects and contraindications in major domestic animal species;
	K2 - Students are able to classify approximately 400 active ingredients together with their assignment to the appropriate ACTVet group up to and including classification level 3;

	K3 - Students understand the issues of environmental impact of drugs and issues of drug residues in animal products.
	K4 - Students know the definitions and concepts in the field of chemotherapy
	K5 - Students know the principles of prescribing organ drugs and chemotherapeutic agents
	Skills:
	S1 - Students are able to choose a systemic drug to achieve the desired changes in the functioning of the healthy organism, considering the dose and route of administration
	S2 - Students are able to choose a systemic drug to modify the functions of the organism suffering from a pathological condition, considering the indications and contraindications for the use of drugs in animals
	S3 - Students are able to select an appropriate chemotherapeutic agent for a defined infectious agent, including determination of a dose and route of administration
	S4 - Students are able to write prescriptions for a medicinal product
	S5 - Students are able to determine the withdrawal period for the drug
	S6 - Students understand drug interactions and their importance in polytherapy
	S7 - Students are able to convey knowledge of drug action and justify the choice of a drug used for treatment
	Social competences:
	C1 - Students choose drugs in a rational way based on the results of diagnostic tests
	C2 - Students are primarily concerned for the patient's welfare when choosing a medication
	C3 - Students find information concerning new systemic drugs and chemotherapeutics by themselves
Prerequisites and additional requirements	Veterinary pharmacology 1, Animal physiology

Module program content	*Lecture topics:* 1. Principles of antimicrobial chemotherapy. [1 hour]. 2. Penicillins. Beta-lactamase inhibitors [3 hours]. 3. Cephalosporins, carbapenems, monobactams [3 hours]. 4. Aminoglycoside antibiotics [3 hours]. 5. Antibiotics with peptide structure [1 hour]. 6. Quinolones and fluoroquinolones [3 hours]. 7. Phenicols, nitrofurans, nitroimidazoles [3 hours]. 8. Pleuromutilins, tetracyclines, lincosamides [3 hours]. 9. Macrolides, azalides, ketolides [3 hours]. 10. Sulfonamides, dihydropyrimidines [1 hour]. 11. Antifungal drugs [3 hours]. 12. Residues of veterinary drugs in animal source foods. Rules for determining withdrawal periods [1 hour]. *Topics of Classes:* 1. Gastrointestinal pharmacology – an introduction. QA drugs – gastrointestinal tract and metabolism. QA04 - antiemetics, emetics, QA02 - drugs affecting gastric secretion [2 hrs]. QA03 - drugs used in functional gastrointestinal disorders, QA06 - laxatives, QA07 - drugs used in constipation, QA05 - drugs regulating liver function, QA08 and QA15 - drugs affecting appetite; selected drugs for regulating the gastrointestinal function in ruminant animals [2 hours]. 2. Cardiovascular pharmacology - an introduction. QC drugs – cardiovascular drugs. QC01A - cardiac glycosides, QC01C – cardiac stimulants, QC01D - vasodilators for the treatment of myocardial diseases. QC07 – beta-adrenergic receptor blockers, QC08 - calcium channel blockers, QC09 - drugs acting on the renin-angiotensin system. QC01B – antiarrhythmics, QC02 – drugs lowering arterial blood pressure, QC04 – drugs dilating peripheral vessels, QC05 – drugs protecting vessels. [2 hrs.] 3 QR drugs - respiratory system. [2 hrs.] 4. QC03 - diuretics. Fluid and electrolyte therapy. QC10 – Pharmacology of the blood and hematopoietic system. QB drugs – blood and hematopoietic system. [2 hrs.] 5. Characteristics of selected gastrointestinal, cardiovascular and respiratory therapeutic products [2 hours]. 6. Pharmacotherapy of mastitis [2 hrs]. 7. Pharmacology of the reproductive system (G01, G02). Drugs used in the regulation of the sexual cycle (G03). Medications in pregnancy. [2 hrs.] 8. Characteristics of selected medicinal products of the reproductive system and sexual cycle regulation, as well as medicinal products used in the treatment of mastitis [2 hours]. 9. Principles of antiparasitic chemotherapy. Drugs used against protozoa, Drugs used against tapeworms and flukes, Drugs used

	against nematodes, Drugs used against external parasites [2 hours]. 10. Antiviral and immunomodulatory drugs [2 hours]. 11. Biologic drugs [2 hrs]. 12. Principles of anticancer chemotherapy. Anti-cancer chemotherapeutics. [2 hrs.] 13. Characteristics of selected antiparasitic, immunomodulatory and anticancer medicinal products [2 hrs]. 14. Practical classes - improving knowledge related to correct medical prescription writing [2 hours].
List of core and supplementary literature	1. Veterinary Pharmacology and Therapeutics, Jim E. Riviere, Mark G. Papich 2. Plumb s Veterinary Drug Handbook, Donald C. Plumb 3. Handbook of Veterinary Pharmacology, Walter H. Hsu.
Planned forms/activities/teaching methods	Lecture, multimedia presentations, group work on issues, discussion, preparation for the credit, preparation for the classes

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<tr><td>Verification methods and ways of documenting the achieved learning outcomes.</td><td>Checking of knowledge is done in written form, after completion of a given subject block. There will be four written colloquia per semester consisting of open-ended and closed-ended descriptive tasks and test tasks. The total points earned on the colloquium are expressed on a relative percentage scale. The scope of knowledge tested on the colloquium includes lecture and exercise topics.
Percentage points from each colloquium are converted into grades according to the following scale: very good - 91-100%., plus good - 81-90%, good - 71-80%., plus satisfactory - 61-70%., satisfactory - 51-60%., unsatisfactory - 0-50%.
Semester/Module 2 credit is based on:
• scoring a minimum of 51% on each of the written colloquia.
• The semester grade is calculated as the arithmetic mean of grades ≥ 3.0 (sufficient) from 4 written colloquia.
In addition, to pass module 2, attendance in at least 85% of the classes in the module plan is required.
The basis for the EXAMINATION is passing module 1 and 2.
The written exam, which may include open-ended descriptive tasks, closed-ended descriptive tasks, test tasks and a practical part (writing prescriptions for drugs - this part is 25% of the maximum number of points available in the exam, at the same time its result must be positive to pass the entire exam). The total points earned on the examination are expressed on a relative percentage scale. The scope of knowledge in the exam includes all topics covered in the veterinary pharmacology course (module 1 and module 2).
Points are converted into grades according to the following scale: very good - 91-100%., plus good - 81-90%, good - 71-80%., plus satisfactory - 61-70%., satisfactory - 51-60%., unsatisfactory - 0-50%.
The final grade is affected by:
• grades for both modules (1 and 2),
• exam grade.
The final grade for the course shall be calculated as follows:
[Course grade obtained in semester 1 (module 1) x 0.125] +
[Semester grade obtained in semester 2 (module 2) x 0.125] +
[Examination grade x 0.75]
The value calculated above is converted to a final grade, as follows: values in the range <0; 3.0) are converted to 2; values in the range <3.0; 3.25) are rounded to 3; values in the range <3.25; 3.75) are rounded to 3.5; values in the range <3.75; 4.25) are rounded to 4; values in the range <4.25; 4.75) are rounded to 4.5; values in the range <4.75; 5.0> are rounded to 5.0.</td></tr>
<tr><td rowspan="2">ECTS credits</td><td colspan="3">CONTACT HOURS</td></tr>
<tr><td></td><td>Hours</td><td>ECTS credits</td></tr>
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	Lectures	15	0,6
	practical classes	30	1,2
	Consultations	5	0,2
	colloquium in practical classes/retake	18	0,73
	Examination / retake examination	6	0,24
	TOTAL contact hours	74	2,97
	NON-CONTACT HOURS		
	preparation for classes	20	0,8
	project preparation	6	0,23
	literature study	10	0,4
	preparation for the exam	15	0,6
	TOTAL non-contact hours/ ECTS credits	51	2,03
The workload related to the classes requiring direct participation of academic teachers:	attendance at lectures	15	0,6
	attendance at practical classes	30	1,2
	Consultations	5	0,2
	colloquium in practical classes/retake	18	0,73
	Examination / retake examination	6	0,24
	TOTAL with direct involvement of the teacher	74	2,97
Relation of module learning outcomes to course learning outcomes.	K1 --- A.W16.+++, A.W10.+++, B.W3.+, B.W4.+, B.W9.,+ K2 --- A.W16.+++, A.W10.+++, B.W3.+, B.W4.+, B.W9.,+ K3 --- A.W18.++ K4 --- A.W17.+++, A.W18.+++, A.W16.+, B.W9.++, B.W3.+, B.W4.+ K5 --- A.W19.+++, A.W20.+++ S1 --- B.U9.+++, B.U13.+++ S2 --- B.U9.+++, B.U13.+++ S3 --- B.U10.++, A.U11.+++ S4 --- B.U10.+++ S5 --- A.U17.++, B.U22.++ S6 --- B.U9.+, B.U20.++, B.U13.+++ S7 --- B.U9.+, B.U20.++, B.U13.+++ C1 --- K1+++ C2 --- K1++ C3 --- K8++		
Elements and values affecting the final grade	Module 2 grade: Colloquium 1 – 25% value Colloquium 2 – 25% value Colloquium 3 – 25% value Colloquium 4 – 25% value The final course grade is calculated based on the grade for module I (12.5% value), the grade for module II (12.5% value) and the final examination grade (75% value).		