

Module code	M_WE_SEM7 TOKS
Field(s) of study	Veterinary medicine
Module name	Veterinary Toxicology Toksykologia weterynaryjna
Language of instruction	English
Module type	Obligatory
Level of studies	Long-cycle Master's degree programme
Mode of study	Full-time
Year of study in the field of study	IV
Semester of study in the field of study	7
ECTS credits, divided into contact/non-contact hours	4 (2,64/1,36)
Academic title/degree, name of the person responsible for the module	Prof. dr. hab. Jose Luis Valverde Piedra
Unit teaching the course	Department of Pharmacology, Toxicology and Environmental Protection
Module objective	Mastery of knowledge and skills in the field of poisoning in animals
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. A student will be familiar with metabolic detoxification processes at the molecular, cellular, organ, and systemic levels.
	K2. A student describes, explains and interprets disorders at the cell, tissue, organ, system and organism level in the course of poisoning.
	K3. A student implements toxicological principles of diagnostic and therapeutic management of animal poisoning.
	K4. A student knows how to conduct a toxicological examination and monitor animal health in a large-scale livestock operation.
	K5. A student collects, analyses and appropriately interprets clinical data and toxicological laboratory test results.
	Skills:
	S1. A student is able to conduct a toxicological interview in order to obtain accurate information about a single animal or group of animals and its or their habitat.
	S2. A student knows how to conduct a toxicological examination of an animal to determine its clinical status.
	S3. A student knows how to administer first aid to all animal species in cases of poisoning.
	S4. A student knows how to collect, secure samples for toxicological studies and knows the principles of their transport, performance of standard laboratory tests, and can correctly analyze and interpret the results of laboratory tests.
	Social competences:
	C1. A student demonstrates responsibility in toxicological aspects of decision making for humans, animals, and the natural environment.
	C2. A student is able to cooperate with representatives of other professions in the field of toxicological public health care.

Preliminary and additional requirements	According to the sequence for subjects
Module programme content	<p><b>Lectures:</b> Toxicology - historical outline, modern directions of development of toxicology. Basic toxicological concepts and terms - Poisons, poisoning, course of poisoning and its causes; definition of poisons, doses, types of poisoning. Determinants of toxicity: physicochemical properties, biological determinants of toxicity. Fate of poisons in the body - absorption, distribution, excretion, biotransformation. Toxicokinetics and toxicodynamics. Toxicity of selected pesticides - synthetic pyrethroids, pyridine alkaloids, dithiocarbamate fungicides, herbicides-derivatives, chlorophenoxychloric acid, dinitrophenols, bispyridyl, derivatives of Urea. POPs - persistent organic pollutants: chlorinated hydrocarbons, polychlorinated biphenyls (PCBs), polychlorinated dibenzodioxins, polychlorinated dibenzofurans 2, 3, 7, 8 TCDD. Phenols and their homologues. Wood preservatives - petroleum and coal products. Organic solvents - aliphatic alcohols, chloroform, carbon tetrachloride, trichloroethylene. Nitrosamines. Animal poisoning by metals and metalloids - cadmium, arsenic, selenium, copper, iron, chromium, zinc, fluorine.</p> <p><b>Exercises:</b> General Toxicology: Diagnosis of acute and chronic poisoning - toxicological history, clinical signs, anatomopathological lesions. Collection and submission of samples for testing and cover letter to toxicology laboratory. General principles of poisoning treatment: The most common animal poisonings (time and place of onset of symptoms, course of poisoning, clinical signs, characteristic anatomopathological lesions, laboratory tests). Lead and mercury poisoning. Poisoning by ethylene glycol and petroleum derivatives (tar, gasoline, paraffin, diesel, paint solvents, adhesives, barbecue firelighters). Pesticide poisoning - insecticides - organophosphates, carbamates, organochlorine compounds. Anticoagulant rodenticides, strychnine, brometalin, zinc phosphide. Mycotoxicoeses. Poisoning by selected plants. Poisoning by selected fungi. Poisons of animal origin - toxins of vipers, snakes, toads, insects. Agents used in the household. Urea poisoning. Nitrate and nitrite poisoning. Sodium chloride poisoning.</p>
List of basic and supplementary literature	<p>Basic literature</p> <ol style="list-style-type: none"> <li>1. VETERINARY TOXICOLOGY Basic and Clinical Principles. Edited by RAMESH C. GUPTA, DVM, MVSC, PHD, DABT, FACT Professor and Head, Toxicology Department Breathitt Veterinary Center Murray State University Hopkinsville, Kentucky, USA. AMSTERDAM • BOSTON • HEIDELBERG • LONDON • NEW YORK • OXFORD. PARIS • SAN DIEGO • SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO Academic Press is an imprint of Elsevier. ISBN: 978-0-12-370467-2. 2007.</li> <li>2. Handbook on Toxicology of Metals available to the reader. Gunnar F. Nordberg, Bruce A. Fowler, Monica Nordberg. Copenhagen 13th June 2005.</li> <li>3. Plant Toxicology. Fourth Edition. Edited by Bertold Hock. Professor of Cell Biology and Dean of the Center of Life and</li> </ol>

	<p>Food Sciences Technische Universität München Freising, Germany. ISBN: 0-8247-5323-2. Marcel Dekker, 270 Madison Avenue, New York, NY 10016, U.S.A. <a href="http://www.dekker.com">http://www.dekker.com</a></p> <p>Supplementary literature</p> <ol style="list-style-type: none"> <li>1. Food and Nutritional Toxicology. Stanley T. Omaye. Boca Raton London New York Washington, D.C. © 2004 by CRC Press LLC .</li> <li>2. A TEXTBOOK OF MODERN TOXICOLOGY. THIRD EDITION. Edited by Ernest Hodgson. Department of Environmental and Biochemical Toxicology. North Carolina State University. A JOHN WILEY &amp; SONS, INC., PUBLICATION. Copyright © 2004 by John Wiley &amp; Sons, Inc.</li> <li>3. VETERINARY TOXICOLOGY, Lecture notes and classes works. GINTARAS DAUNORAS. Study kit for LUHS Veterinary Faculty Foreign Students LSMU LEIDYBOS NAMAI, KAUNAS 2012.</li> </ol>		
Planned forms/activities/teaching methods	<ol style="list-style-type: none"> <li>1. Lecture - 30 hrs,</li> <li>2. Laboratory exercises - 5 hrs,</li> <li>3. Recitation section (films showing clinical course of poisoning in animals and therapeutic management) - 25 hours,</li> <li>4. Written credits.</li> </ol>		
Verification methods and ways of documenting the achieved learning outcomes.	<p>K - 4 credit passes (single-choice test, grading scale according to the Book of Quality of Education), final written exam (single-choice test, grading scale according to the Book of Quality of Education).</p> <p>S - Evaluation of activity in thematic discussions during exercises - the ability to use and interpret the results of laboratory tests related to the toxic effects of xenobiotics and assess their impact on human and animal health.</p> <p>C - Evaluation of activity in thematic discussions during exercises - ability to use and interpret data related to toxicodynamics and toxicometry of xenobiotics and assess their effects on human and animal health.</p>		
ECTS credits		contact hours	ECTS credits
	lectures	30	1,2
	participation in laboratory exercises	30	1,2
	exam attendance consultations connected with the preparation for the credit exam attendance	6	0,24
		non-contact hours	
	preparing for laboratory exercises	15	0.6
	Preparation for the exam	19	0.76
	The total student workload is 100 hours	100	4.0
The workload of activities that require direct participation of an academic teacher	<ul style="list-style-type: none"> <li>- participation in lectures - 30 hrs.,</li> <li>- participation in exercises - 30 hours.</li> <li>- exam attendance - 6 hours.</li> <li>- participation in consultations connected with preparation for the credit</li> </ul>		

	The total workload is 66 hours, which equals 2.64 ECTS credits
Relation of module learning outcomes to major learning outcomes	W1. --- WE_W04 +++ W2. --- WE_W15 +++ W3. --- WE_W18 +++ W4. --- WE_W19 +++ W5. --- WE_W21 +++ U1. --- WE_U14 +++ U2. --- WE_U16 +++ U3. --- WE_U17 +++ U4. --- WE_U19 +++ K1. --- WE_K1 +++ K2. --- WE_K9 +++
Elements and values affecting final grade	Component grades 20% Final examination 80%