Module code	M_WE_SEM2 OŚ
Field of study	Veterinary medicine
Module name, also the name in English	Environmental Protection
	Ochrona środowiska
Language of instruction	English
Module type	Mandatory
Level of studies	Long-cycle Master's Degree studies
Mode of study	Full-time
Year of study in the field of study	I
Semester of study in the field of study	2
ECTS credits, divided into contact/non-contact hours	2 (1,54/0,46)
Academic title/degree, name of the person responsible for the module	Prof. dr. hab. Valverde Piedra Jose Luis
Unit teaching the module	Department of Pharmacology, Toxicology and Environmental Protection
Module objective	Mastery of knowledge and skills in the field of environmental protection
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. Student has an extended knowledge of the processes occurring in the ecosystems, knows and describes the biological effects of environmental pollution by factors that disrupt their functioning and knows methods to reduce the negative impact of chemical substances on the environment, human and animal health.
	K2 Student has knowledge of biological and chemical factors causing environmental pollution related to animal production
	Skills:
	S1. The student communicates effectively with environmental inspection personnel regarding the veterinarian's role in environmental protection.
	S2. The student has the ability to search, analyze and use necessary information on environmental protection from various sources in order to cooperate in interdisciplinary teams
	S3. Student is able to identify the negative environmental and biological effects of natural and synthetic chemicals in agriculture, industry, and municipal management and the methods used to minimize the negative effects of environmental pollution.
	Social competences:
	Sc1. The student is aware of the importance of social, professional and ethical responsibility for shaping and condition of the natural environment
Preliminary and additional requirements	According to the sequence of subjects
Module programme content	Lectures: Introduction to ecology, environmental protection and nature conservation. Forms of nature conservation in Poland - historical outline and current

	state. International conventions and organizations working to protect the environment and nature. Legal norms for nature conservation in Poland. Ecosystem processes and disruptors - Water contamination: diseases caused by algae and seaweed (cyanobacteria, protozoa, kelp), diseases caused by estrogens, diseases caused by parabens. Water chlorination: positive and negative effects. - Atmospheric processes: stratospheric ozone formation, ozone hole, freons. Application of ozone in medical treatment. Environmental noise and vibration. Transportation and communication as a source of hazardous substances in the atmosphere: gaseous (carbon monoxide and dioxide, nitrogen oxides, particulate matter (respirable), asbestos, crystalline substances, silica, latex, PAHs, lead. Radiation hazards: types of radiation, biological effects of ionizing radiation, role of free radicals, non-ionizing radiation. The physician's role in environmental protection. Environmental pollution and human and animal health - food safety. Exercises: Ecology, environmental protection and nature conservation terminology. Ecosystem structure and function: energy flow and circulation of matter. Environmental protection program, natural environmental monitoring, veterinary monitoring. The atmosphere under natural conditions and the processes occurring in it. Atmospheric air pollution and protection. Global effects: greenhouse effect, acid rain, smog, ozone hole. Effects of air pollution on human and animal health, on plants, and on other elements of the environment. Water cycle - hydrological cycle, water balance in Poland and in the world. Types and sources of water pollution. Surface water classification. Methods for assessing surface water quality. Wastewater - types and composition. Effects of water pollution on the environment - the phenomenon of eutrophication. Ways of protecting water from pollution - methods of wastewater treatment. Water treatment - definition and methods of water treatment. Wastewater treatment methods. Causes of soil degradation and their protection and restoration. Protecting the environment from waste. Types, properties, and sources of radiation. Characteristics of selected types of radiation. Ionizing radiation effects on the environment. Consequences of radioisotope contamination. Non-ionizing electromagnetic radiation impacts on the environment. Nuclear power - pros and cons. The hopes and dangers of radioactivity. The positive and negative effects of a nuclear power plant on the environment.
List of basic and supplementary literature	Required readings: 1. Environmental Science. Singh J.K. New Delhi · Bangalore · Chennai · Cochin · Guwahati · Hyderabad.

<table>
<tr><td></td><td colspan="2">Jalandhar · Kolkata · Lucknow · Mumbai · Ranchi. Www.newagepublishers.com Copyright © 2006 New Age International (P) Ltd., Publishers. Published by New Age International (P) Ltd., Publishers
2. Basics of Environmental Science. Second edition 2000. © 1996, 2000 Michael Allaby. London and New York.
Auxiliary books and articles:
1. Environmental toxicology : Biological and health effects of pollutants. Ming-Ho Yu. ISBN 1-56670-670-X. CRC PRESS. Boca Raton London New York Washington, D.C.
2. The Handbook of Environmental Chemistry v. 3, pt. A-). Edited by 0. Hutzinger. ISBN 978-3-662-15998-9 DOI 10.1007/978-3-540-38522-6. 2009 by the Society of Environmental Toxicology and Chemistry (SETAC).
3. Veterinary Medicines in the Environment. Mark Crane, Alistair B. A. Boxall, Katie Barrett Coordinating Editor of SETAC Books Joseph W. Gorsuch, Gorsuch Environmental Management Services, Inc. Webster, New York, USA. From the SETAC Pellston Workshop on Veterinary Medicines in the Environment, Pensacola, Florida, USA. 12–16 February 2006.
4. The roles of veterinary, medical and environmental professionals to achieve ONE HEALTH. Pal et al. J. Adv. Vet. Anim. Res., 1(4): 148-155, December 2014, 1481.</td></tr>
<tr><td>Planned forms/activities/teaching methods</td><td colspan="2">1. Lecture -15 hours.
2. Auditory and laboratory exercises (multimedia presentations, quality tests) - 15 hours.
3. Tests of acquired knowledge
4. Discussion</td></tr>
<tr><td>Verification methods and ways of documenting the achieved learning outcomes.</td><td colspan="2">K - Two credit passes (single-choice test, grading scale according to the Book of Education Quality), final written exam (single-choice test, grading scale according to the Book of Education Quality).
S - Evaluation of activity in thematic discussions during exercises - ability to use and interpret data related to the quality of the environment and evaluate their impact on human and animal health.
C - Evaluation of activity in thematic discussions during exercises - ability to use and interpret data related to the quality of the environment and assess their impact on human and animal health.</td></tr>
<tr><td rowspan="5">ECTS credits</td><td>Number of contact hours</td><td>ECTS</td></tr>
<tr><td>• participation in lectures - 15 hrs.,
• participation in lab classes - 15 hrs.
• Consultations – 5 hrs
• exam attendance – 3 hrs.</td><td>0,6
0,6

0,22
0,12</td></tr>
<tr><td>Number of non-contact hours</td><td>ECTS</td></tr>
<tr><td>- preparation for lab classes – 7,5 hrs,
- preparation for credits and examination 4 hrs</td><td>0,3
0,16</td></tr>
</table>

	The total student workload is 11,5 hours	0,46
The workload of activities that require direct participation of an academic teacher	- participation in lectures - 15 hrs., - participation in classes - 15 hrs, - Consultations – 5 hrs - exam attendance - 2 hrs. 38 hrs total. Which corresponds to 1.54 ECTS credits Workload associated with hands-on activities:	
Relation of module learning outcomes to major learning outcomes	K1. --- B.W15. +++ K2. --- A.W13. +++ S1. --- A.U1. +++ S2. --- AU15. +++ S3. --- B.U25.+++ Sc.1. --- K1) +++ Sc2. --- K11) ++	
Elements and values affecting final grade	Component grades 20% Final examination 80%	