

Course code: .....

Plan position: .....

## 1. INFORMATION ABOUT THE COURSE

### A. Basic information

Name of course	Toxicology
Field of studies	
Level of studies	
Profile of studies	academic
Form of studies	stationary
Specialty	
Unit responsible for the field of studies	Faculty of Animal Breeding and Biology
Name and academic degree of teacher(s)	Dorota Cygan-Szczegielniak, PhD
Introductory courses	chemistry, biochemistry
Introductory requirements	-

### B. Semester/week schedule of classes

Semester	Lectures (W)	Auditorium classes (Ć)	Laboratory classes (L)	Project classes (P)	Seminar (S)	Field classes (T)	Number of ECTS points
summer	10		15				5

## 2. LEARNING OUTCOME

No.	Learning outcomes description	The reference to the learning outcomes of specific field of study	The reference to the learning outcomes for the area
<b>KNOWLEDGE</b>			
W1	The student knows toxicological terminology and is acquainted with the fate of toxins in human or animal organisms: absorption, distribution, metabolism, excretion and accumulation.		
W2	The student knows the basic tests to detect toxic substances and knows and understands the issues implemented during the classes.		
<b>SKILLS</b>			
U1	On completing the course, the student is able to perform toxicological anamnesis.		
U2	The student can correctly select the samples for toxicological analysis, perform basic tests for		

	detecting toxic substances and draw adequate conclusions from the results.		
<b>SOCIAL COMPETENCES</b>			
K1	The student is aware of the modes of action, metabolism and accumulation of toxins in living organisms. He is also conscious of the threats associated with working on biological material, he is able to co-operate with his group.		
K2	The student is aware of the applicability of toxicological tests and the impact of various factors on inducing the selected toxicoses.		

### 3. TEACHING METHODS

multimedia lecture, laboratory classes, specialized instructional videos

### 4. METHODS OF EXAMINATION

colloquium (once a semester), presentation (once a semester), lab report (twice a semester)

### 5. SCOPE

Lectures	Toxicology, definition, classification. The relation between the dose and the effect. Animal, plant, bacterial and fungal toxins. Toxicoses – their causes and classification. Biological and chemical factors affecting the toxicity. The fate of toxins in living organisms: absorption, distribution, biochemical reactions, excretion and accumulation. Toxicokinetics. Toxicometric methods in assessing the toxicity. The issue of the presence of drugs and toxins in products of animal origin, food additives and contamination. Metabolism and accumulation of toxins in living organisms. The relation between the chemical structure and toxic properties of substances. Validation of analytical methods. The impact of environmental contaminations on the homeostasis of living organisms.
Laboratories	The rules for collecting the samples and sending them to the toxicological analysis. Various methods for isolating chemical compounds from biological samples (plants, animal tissues, animal feed). Applicability of instrumental methods for determining the toxins in biological samples (animal tissues, animal feed) and environmental tests (chromatography - HPLC, TLC, spectrophotometry, etc.). Validation of analytical methods. Graphic methods of determining lethal doses (LD). Interpretation of dose and relation curves; probit calculation. Preparing samples for chromatographic analysis - liquid-liquid extraction, solid phase extraction (SPE), hydrolysis. Calculating the true content of the analyte in the given sample. Detecting benzoic acid, salicylic acid and sulfur compounds in food and animal feed.

### 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES

	Form of assessment
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LEARNING OUTCOME	Oral examination	Written exam	Colloquium	Project	Presentation	Lab report
W1			x		x	x
W2			x		x	x
U1			x			x
U2			x			x
K1					x	
K2					x	

## 7. LITERATURE

Basic literature	1.Curtis D. Klaassen Casarett & Doull's, 2018. Toxicology, The Basic Science of Poisons, Seventh Edition 2.Lindsay Murray, Mark Little, 2015. Toxicology Handbook 3. Ramesh C. Gupta., 2018. Veterinary Toxicology. Basic and Clinical Principles
Supplementary literature	4.Curtis Klaassen, John B. Watkins, 2021. Essentials of Toxicology, Second Edition

## 8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	25
	Supervision hours	5
Student's own work	Preparation for classes	30
	Reading assignments	30
	Other (preparation for exams, tests, carrying out a project etc)	35
Total student workload		125
Number of ECTS points		5