



Module syllabus: *Ecotoxicology*

1. Overall information

Module coordinator	dr hab. Alina Kafel
Contact	alina.kafel@us.edu.pl ; +48 32 359 1260
ECTS	5
Method for the verification of learning outcomes	<p>The final grade for the module is weighted on the average of the following student activities:</p> <ul style="list-style-type: none">- Active participation in the laboratory classes (continuous evaluation of practical skills, tests and reports) (0.7)- Written final exam (0.3) <p>To be awarded a final grade, the student must have passed each activity of the module.</p> <p>Grades: below 51% – fail (F); 52-60% – with minimum academic criteria (E); 61-65% – satisfactory (D); 66-75% – good (C); 76-85% – very good (B), ≥ 85% – excellent (A)</p>

2. Description of student activity and work

Lecture/discussion sessions	
Responsible instructor	dr hab. Alina Kafel
Content	<p>The main objective of this module is to acquaint students with the fate of various chemicals in the environment and their effects on living organisms, as well as to develop their skills for critically interpreting published data on environmental toxicology.</p> <p>Lectures/discussion sessions will comprise core subjects in ecotoxicology, including the methodologies used in toxicology, environmental chemistry and ecology.</p> <p>Lecture/discussion session content: Ecotoxicology as an interdisciplinary subject that includes the following: The routes and effects of toxic substances and xenobiotics in different environments (case studies). The fate of toxicants at different levels of biological complexity. Interactions between chemicals and environmental factors. Ecotoxicity – measurements, standardised assays, legal and ethical regulations. Test organisms and the quantification of risk characterisation. Biomonitoring and biomarkers. The laboratory models and field trials (microcosm, mesocosm and macrocosm) used in ecotoxicology. Endocrine disrupting chemicals in the environment. Environmental impact assessment (EIA). Effects of man-made environmental disasters (case studies).</p>
Number of didactic hours (contact hours)	20
Literature	Ecotoxicology. C.H. Walker et al., 2014 CRC Press





Ecotoxicology G. Begun., 2012. Intech

Laboratory	
Responsible instructors	Staff of the Department of Animal Physiology and Ecotoxicology and the Department of Ecology
Laboratory projects	Project 1: Acute toxicity test. Comparing the sensitivity of two zooplankton representatives (<i>Chaoborus</i> sp. and <i>Daphnia</i> sp.) to common water contaminants. Measuring the LC ₅₀ and EC ₅₀ values. Developmental parameters of the water flea (optionally). Project 2: Synergistic effects of toxicants. Project 3: Age-dependent sensitivity of house crickets to xenobiotics. Survival rate assessment. Project 4. Standardised toxicity assays in freshwater environments (e.g. Ostracodtoxit F). Project 5: Metal effects on the morphology and physiology of plants.
Methodology of laboratory classes	Experiments will be performed in small groups under the supervision of the instructors and will include: <ul style="list-style-type: none">• Designing and accomplishing the procedure• Calculating and presenting the results• Protocols commitment and presentation
Number of didactic hours (contact hours)	45
Literature	Ecotoxicology. C.H. Walker et al., 2014. CRC Press Ecotoxicology. G. Begun, 2012. Intech

3. Forms of verification

Continuous evaluation of knowledge, activity and practical skills	
Grades	Grades are awarded on a scale: A-F, where A is the best and F is a fail. <u>An excellent performance (A)</u> – the student actively participates in laboratory work, demonstrates an excellent understanding of the experimental procedures (its aims, sequence and outcomes) is engaged and creative in solving current problems and in an assessment and presentation of experimental results. <u>A good performance (C)</u> – the student demonstrates a good judgment and knowledge, correctly provides an experiment, correctly exhibits a sense of an experimental procedure, properly provides an assessment and presentation of experimental results. <u>A satisfactory performance (E)</u> – the student demonstrates a satisfactory judgment and knowledge, is poorly engaged and needs additional help to finish the experiment and final assessment of the experimental results correctly, present satisfactory presentation of experimental results. <u>A performance that does not meet the minimum academic criteria (F)</u> – the students is not engaged in experiment, did not exhibit sense of experimental procedures, poorly interprets and presents experimental results.





Reports from realised laboratory projects	
Evaluation	Evaluation comprises judgment and knowledge related to the sense and methods of a laboratory project, engagement in realisation, quality of assessing and presenting the experimental results, use of reference materials. Grades for reports are awarded on a scale: A-F, where A is the best and F is a fail. An excellent report (A) – without any essential errors Fail (F) – no report

Final exam	
Grades	Grades are awarded on a scale: A-F, where A is the highest and F is a fail. Excellent (A) – the student presents a fluent knowledge of the mechanisms of the actions of toxicants and other aspects of ecotoxicology, has minimal errors that do not affect the quality of the presentation. Good (C) – the student presents a good knowledge of the mechanisms of the actions of toxicants and other aspects of ecotoxicology, makes rare but subtle errors. Satisfactory (E) – the student exhibits a satisfactory knowledge, but with a poor understanding of the mechanisms of the actions of toxicants and other aspects of ecotoxicology and makes subtle errors. Fail (F) – the student does not present a satisfactory knowledge of the mechanisms of the actions of toxicants and other aspects of ecotoxicology and makes many substantial errors, which disqualify their presentation.

