

Subject name	Ecotoxicology	
Subject code	R.3s.ECO.SM.ROSAY	
Department	Agricultural and Environmental Chemistry	
Faculty	Agriculture and Economics	
Subject supervisor/Lecturer	Dr. Agnieszka Baran	
General information	semester	winter
	ECTS credits	4
	Lectures total	15 hrs
	Laboratories	30 hrs
Objective and general description	<p>Definition and classification of toxins. Factors conditioning toxicity. Fate of toxins in organisms, ecosystems and their mechanisms. Toxicity and methods of detoxication.</p> <p><u>Lectures</u></p> <p>1-2. Ecotoxicology as an interdisciplinary science. The basic terms of ecotoxicology: xenobiotic, harmful chemical, pollutant, poison, toxicology, bioassays, biomarkers and biosensors.</p> <p>3-5. Fate of toxic substances in the ecosystem (toxic substances and their division, toxic substances routes, bioaccumulation and biomagnifications coefficients).</p> <p>6-7. The effect of physicochemical factors in the environment on the interactions between toxic substances (synergism, addictiveness, compensation). Speciation of metals in soils and bottom sediments</p> <p>8-10. Fate of toxic substances in living organism. Biochemical mechanisms of the toxic action of selected chemical groups. Methods of detoxication.</p> <p>11-13. Heavy metal stress in plants and antioxidants – essential knowledge.</p> <p>14-15. Health and Ecological Risk Assessment</p> <p><u>Classes</u></p> <p>1-3. Dose-response relationships. Quantitative indices of toxic effects assessment. Computing of LD50 on the basis of experimental data</p> <p>4-6 Assessment of toxicity of soil and bottom sediment contaminated with heavy metals for plants – Phytotoxkit test</p> <p>7-10. Assessment of concentration of heavy metal in soil and plants – calculation of Bioaccumulation Coefficientes</p> <p>11-14. Assessment of toxicity of soil contaminated with WWA and heavy metals for earthworm</p> <p>15-17. Assessment of toxicity of freshwater using the crustacean <i>Daphnia magna</i></p> <p>18 -20. Toxicity of natural substance – Assessment of oxalates concentration in selected stimulants (coffee, tea)</p> <p>21-23. Toxicity of salt – Assessment of chloride concentration in food (bread).</p> <p>24-26. Toxicity of mercury – Assessment of mercury concentration in fish.</p> <p>27-30. Reactive oxygen species and oxidative stress in plants.</p>	

Assessment method	<p>Tests</p> <ul style="list-style-type: none"> - Assessment of each exercise - will take into account the correctness of this exercise, efficiency and organization of work in a team lectures - Oral examination
References	<ol style="list-style-type: none"> 1. Walker C.H, Hopkin P., Silby R.M., Peakall D.B. Principles of Ecotoxicology. Taylor&Francis, 2000. 2. Begom G.(red). Ecotoxicology. InTech, 2012. 3. Hoffman D., Barnett A., Ratner G., Allen Burton Jr., John Carns Jr. Handbook of Ecotoxicology. CRC Press LLC 4. Williams P.LJames R.C, Roberts SM. Principles of Toxicology. Environmental and Industrial Application. John Wiley & Sons, 2000