

<b>Course code</b>																																	
<b>Type and description</b>	Elective Course																																
<b>ECTS credit</b>	1																																
<b>Course name</b>	Modern environmental ecotoxicology																																
<b>Course name in Polish</b>	Nowe perspektywy w ekotoksykologii środowiskowej																																
<b>Language of instruction</b>	English																																
<b>Course level</b>	8 PRK																																
<b>Course coordinator</b>	Dr hab. Adriana Nowak, prof. PŁ																																
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<b>Delivery methods and course duration</b>	<table border="1"> <thead> <tr> <th></th> <th>Lecture</th> <th>Tutorials</th> <th>Laboratory</th> <th>Project</th> <th>Seminar</th> <th>Other</th> <th>Total of teaching hours during semester</th> </tr> </thead> <tbody> <tr> <td>Contact hours</td> <td>0</td> <td>0</td> <td>0</td> <td>15</td> <td>0</td> <td>0</td> <td>15</td> </tr> <tr> <td>E-learning</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td>No</td> <td></td> </tr> <tr> <td>Assessment criteria (weightage)</td> <td>0,00</td> <td></td> <td></td> <td></td> <td></td> <td>0,00</td> <td></td> </tr> </tbody> </table>		Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester	Contact hours	0	0	0	15	0	0	15	E-learning	No	No	No	No	No	No		Assessment criteria (weightage)	0,00					0,00	
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<b>Course objective</b>	Acquiring knowledge and skills in the field of testing the toxicity of environmental pollutants with the application of model organisms.																																
<b>Learning outcomes</b>	Having completed the course student can: <ol style="list-style-type: none"> <li>Describe types of ecotoxicological tests and methods of testing potential environmental pollutants. W4, U4, K1</li> <li>Choose the methods of conducting the toxicity test and select test organism. W4, K1</li> <li>Apply the knowledge for elaboration and interpretation of the obtained results. U4, K1</li> </ol>																																
<b>Assessment methods</b>	<p>W4 – discussion</p> <p>U4, K1 – project seminar presentation</p> <p>W4, U4 – written project</p> <p>The final grade:</p> <p>Presentation - 60%</p> <p>Discussion - 20%</p> <p>Project evaluation - 20%</p>																																
<b>Prerequisites</b>																																	
<b>Course content with delivery methods</b>	<p>LECTURE</p> <ol style="list-style-type: none"> <li>Types of ecotoxicological tests and methods of testing potential environmental pollutants. The most commonly used test organisms.</li> <li>Bioindication and bioindicators of environmental pollution.</li> <li>Interactions of chemicals with DNA. Radioactive pollution. Endocrine disruptors.</li> </ol>																																

	<p>4. Eco-cyto- and eco-genotoxicity tests on model organisms (bacteria, eukaryotes) and cell lines.</p> <p>PROJECT</p> <p>5. Method of testing the ecotoxicity of a reference chemical against a model organism by different methods. Formulating research hypotheses and a research problem, selection of organism/s and test/s, analysis of toxicity, elaboration and interpretation of the results.</p>
<b>Basic reference materials</b>	<ol style="list-style-type: none"> <li>David J. Hoffman, Barnett A. Rattner, G. Allen Burton Jr., and John Cairns Jr. <i>Handbook of Ecotoxicology, Second Edition</i>, Lewis Publishers, Boca Raton, FL (2003).</li> <li>Ernest Hodgson, <i>A Textbook of Modern Toxicology</i>, ISBN:9780471265085, DOI:10.1002/0471646776, John Wiley &amp; Sons, Inc. (2010).</li> <li>Sigmund F. Zakrzewski, <i>Environmental Toxicology, Third Edition</i>, OXFORD UNIVERSITY PRESS, (2002).</li> </ol>
<b>Other reference materials</b>	<ol style="list-style-type: none"> <li><b>Nowak A.</b>, Nowak I. (2022) Review of harmful chemical pollutants of environmental origin in honey and bee products. <i>Crit. Rev. Food Sci. Nutr.</i> DOI: 10.1080/10408398.2021.2012752.</li> <li>Szulc J., Okrasa M., Majchrzycka K., Sulyok M., <b>Nowak A.</b>, Szponar B., Górczyńska A., Gutarowska B. (2022) Microbiological and toxicological hazard assessment in a waste sorting plant and proper respiratory protection. <i>J. Environ. Manage.</i> 303, 114257, 1-15.</li> <li>Szulc J., Okrasa M., Majchrzycka K., Sulyok M., <b>Nowak A.</b>, Ruman T., Nizioł J., Szponar B., Gutarowska B. (2021) Microbiological and toxicological hazards in sewage treatment plant bioaerosol and dust. <i>Toxins</i> 13(10), 691.</li> <li>Szulc J., Okrasa M., Dybka-Stępień K., Sulyok M., <b>Nowak A.</b>, Otlewska A., Szponar B., Majchrzycka K. (2020) Assessment of microbiological indoor air quality in cattle breeding farms. <i>Aerosol Air Qual. Res.</i> 20(6), 1353–1373.</li> <li><b>Nowak A.</b>, Bakula T., Matusiak K., Gałęcki R., Borowski S., Gutarowska B. (2017) Odorous compounds from poultry manure induce DNA damage, nuclear changes, and decrease cell membrane integrity in chicken liver hepatocellular carcinoma cells. <i>Int. J. Environ. Res. Public Health</i> 14(8), 1-13. 933.</li> <li><b>Nowak A.</b>, Matusiak K., Borowski S., Bakula T., Opaliński S., Kołacz R., Gutarowska B. (2016) Cytotoxicity of odorous compounds from poultry manure. <i>Int. J. Environ. Res. Public Health</i> 13(11), 1046, 1-15.</li> </ol>
<b>Average student workload outside classroom</b>	10h
<b>Comments</b>	
<b>Last update</b>	27.04.2023