



Subject card

Subject name and code	Ecotoxicology, PG_00048794						
Field of study	Green Technologies						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Monika Pawłowska					
	Teachers	dr inż. Monika Pawłowska					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study	SUM	
	Number of study hours	30	5.0		15.0	50	
Subject objectives	Gaining basic knowledge about the functioning of organisms and the existing threats to them in the environment. Understanding the toxic factors that affect living organisms and have an impact on entire ecosystems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W04] is aware of the importance of environmental protection and has a basic knowledge of chemical and biological threats to the environment, with particular emphasis on anthropogenic factors, has a basic knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions.	Can assess the role of environmental protection in removing toxic chemical and biological hazards and is aware of the role of anthropogenic factors involved in it. Has knowledge of national and European conditions aimed at reducing the presence of toxic substances in the environment.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		

Subject contents	<p>The lecture entitled Ecotoxicology aims to present the causes and biochemical mechanisms that influence the effects of the environmental pollutants on the living organisms. It will not provide the descriptive knowledge about the toxic effects induced by chemicals, but will make students understand the processes responsible for these effects. It is assumed in this program that students had already gained the fundamental knowledge in biochemistry.</p> <p>The course covers the following subjects:</p> <ol style="list-style-type: none"> 1. Introduction to ecotoxicology, definitions and history 2. Physicochemical properties responsible for toxic effects. 3. The penetration routes of chemicals inside the living organisms. 4. Metabolic transformations as the detoxication and activation pathways of the strange substances introduced into living organism.. 5. Bioconcentration and bioaccumulation processes in the living organism and in the environment as a whole. 6. Biochemical mechanisms of mutagenic and carcinogenic action of xenobiotics. 7. Selected physiological effects of toxicants: action towards nervous system, teratogenic, immunosuppressive and allergenic effects. 8. Biochemical mechanisms of the toxic action of selected groups of chemicals, for instance: heavy metals, asbestos, polycyclic aromatic hydrocarbons, polychlorinated biphenols, dioxins or xenoestrogens. 9. Methods for toxicity assessment of xenobiotics and employed for the prediction of this toxicity for new compounds introduced into the environment. 10. Sources of pollutants in the environment and their displacement. 								
Prerequisites and co-requisites									
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>100% evaluation</td> <td>60.0%</td> <td>100.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	100% evaluation	60.0%	100.0%
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100% evaluation	60.0%	100.0%							
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Witold Seńczuk Toksykologia Współczesna, PZWL, Warszawa 2006 2. Sigmund F. Zakrzewski Podstawy toksykologii środowiska, PWN, Warszawa 1997 3. J. Namieśnik, J. Jaśkowski Zarys ekotoksykologii, Gdańsk, 1998 4. C.H. Walker, S.P. Hopkin, R.M. Sibly, D.B. Peakall Podstawy ekotoksykologii, PWN, Warszawa 2002 5. R.M. Sibly, Principles of Ecotoxicology, Taylor and Francis, 2012 6. J. Paasivirta, Chemical Ecotoxicology, Lewis Publ. 1991 							
	Supplementary literature	<ol style="list-style-type: none"> 1. J.B. Harborne Ekologia biochemiczna, PWN, Warszawa 1997 2. Aleksander Kołodziejczyk, Naturalne związki organiczne, Gdańsk 2000 3. Witold Seńczuk, Toksykologia pod redakcją, PZWL, Warszawa, 1994 							
	eResources addresses	Adresy na platformie eNauczanie: Ekotoksykologia - Moodle ID: 34046 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34046							
Example issues/ example questions/ tasks being completed	<p>Whar are the chracteristics of the substances that make them toxic?</p> <p>What is the pathway of metabolic transformations of xenobiotics, which penetrate our organism?</p> <p>How to determine the LD₅₀ dose of the test compound?</p> <p>Haw to determine the concentration of selected pesticide in soil?</p>								
Work placement	Not applicable								