



## Subject card

Subject name and code	Toxicology, PG_00053380						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group		Optional subject group 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	1		Language of instruction		Polish		
Semester of study	2		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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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		2.0		18.0	50
Subject objectives	Transfer of knowledge about the toxic properties of compounds and their impact on living organisms and the environment, Presentation of methods for their detection and possible countermeasures.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W51] Knows and understands, to an increased extent, selected aspects of chemistry and biochemistry constituting general knowledge in the field of biomedical engineering.		He can use his knowledge to describe the threats resulting from the influence of external factors on humans and other organisms in the environment. He can apply his knowledge in biomedical engineering, designing safer technical solutions.		[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems		Is able to apply the knowledge acquired so far to assess the toxicity of agents external, possibilities of implementing this knowledge to describe chemical phenomena and processes observed in the environment man and industry.		[SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work		

Subject contents	<p>The classes will cover the following topics:</p> <ol style="list-style-type: none"> <li>1. Basic definitions concerning toxicology, history of toxicology.</li> <li>2. Physicochemical properties influencing the toxicity of compounds.</li> <li>3. The fate of substances in the body, pathways and mechanisms of penetration, reactions of metabolism as a way of activation and detoxification, xenobiotics excretion and accumulation. Problems of bioconcentration and bioaccumulation in the organism and in the environment.</li> <li>4. Methods of testing the toxicity of substances to living organisms and the environment as a whole.</li> <li>5. Selected physiological effects of toxic substances: influence on the nervous system, teratogenic, immunosuppressive and allergic effects of environmental pollutants</li> <li>6. Mechanisms of toxic action of selected groups of compounds, incl. heavy metals, asbestos, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, bisphenols, dioxins and xenoestrogens</li> </ol>											
Prerequisites and co-requisites												
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 799 794 831">Subject passing criteria</th> <th data-bbox="799 799 1141 831">Passing threshold</th> <th data-bbox="1145 799 1482 831">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 837 794 869">Lecture</td> <td data-bbox="799 837 1141 869">60.0%</td> <td data-bbox="1145 837 1482 869">60.0%</td> </tr> <tr> <td data-bbox="453 875 794 907">Seminar</td> <td data-bbox="799 875 1141 907">60.0%</td> <td data-bbox="1145 875 1482 907">40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Lecture	60.0%	60.0%	Seminar	60.0%	40.0%
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Lecture	60.0%	60.0%										
Seminar	60.0%	40.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Witold Seńczuk, Toksykologia, PZWL, Warszawa,</li> <li>2. Witold Seńczuk, Toksykologia Współczesna, PZWL, Warszawa, 2006</li> <li>3. Sigmund F. Zakrzewski, Podstawy toksykologii środowiska, PWN 1997</li> <li>4. Jerzy K. Piotrowski, Podstawy toksykologii, PWN, 2005</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. J. Namieśnik, J. Jaskowski, Zyrus Ekotoksykologii, EKO-Pharma, Gdańsk, 1995</li> <li>2. C.H. Walker, S.P. Hopkin, R.M. Silby, D.B. Peakali, Podstawy Ekotoksykologii, PWN, Warszawa, 2002</li> </ol>										
	eResources addresses	Adresy na platformie eNauczanie:										
Example issues/ example questions/ tasks being completed	<p>What are the characteristics of the substances that make them toxic?</p> <p>What are the stages of metabolic transformations of xenobiotics getting into living organisms?</p> <p>How to determine the LD<sub>50</sub> dose?</p> <p>Why are xenoestrogens dangerous contaminants?</p>											
Work placement	Not applicable											