



## Subject card

Subject name and code	Toxicology, PG_00053380						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2022	Academic year of realisation of subject				2022/2023	
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		dr inż. Monika Pawłowska				
Lesson type and method 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	Can use the knowledge gained so far to assess the toxicity of external factors, the possibilities of implementing this knowledge to describe the phenomena and chemical processes observed in the environment of humans and industry.			[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice		

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">Seminar</td> <td data-bbox="799 837 1141 869">60.0%</td> <td data-bbox="1145 837 1482 869">40.0%</td> </tr> <tr> <td data-bbox="453 875 794 907">Lecture</td> <td data-bbox="799 875 1141 907">60.0%</td> <td data-bbox="1145 875 1482 907">60.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Seminar	60.0%	40.0%	Lecture	60.0%	60.0%
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Seminar	60.0%	40.0%										
Lecture	60.0%	60.0%										
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Witolda Seńczuk, Toksykologia, PZWL, Warszawa,</li> <li>2. Witolda Seńczuk, Toksykologia Współczesna, PZWL, Warszawa, 2006</li> <li>3. Sigmund F. Zakrzewski, Podstawy toksykologii środowiska, PWN 1997</li> <li>4. Jerzego K. Piotrowskiego Podstawy toksykologii, PWN, 2005</li> </ol>										
	Supplementary literature	<ol style="list-style-type: none"> <li>1. J. Namieśnik, J. Jaskowski, Zyrys 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											
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											