



Subject card

Subject name and code	Toxicology, PG_00053380						
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-cycle studies		Subject group		Optional subject group Specialty 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_W03] knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum		Has an in-depth knowledge of the mechanisms of action of toxic compounds, understands the relationship between their action and the reaction of a living organism; is able to present in detail the impact of materials used in engineering on human health.		[SW2] Assessment of knowledge contained in presentation		
	[K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems		Can 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.		[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		
	[K7_W51] Knows and understands, to an increased extent, selected aspects of chemistry and biochemistry constituting general knowledge in the field of biomedical engineering.		Can use his knowledge to describe the threats resulting from the influence of external factors on humans and other organisms in the environment. Can apply his knowledge in biomedical engineering, designing safer technical solutions.		[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		

Subject contents	The following topics will be discussed during the classes: 1. Basic definitions in the field of toxicology, history of toxicology. 2. Physicochemical properties affecting the toxicity of compounds. 3. The fate of substances in the body, routes and mechanisms of entry, metabolic reactions as a route of activation and detoxification, excretion of substances and their accumulation. Problems of bioconcentration and bioaccumulation in the body and the environment. 4. Methods of testing the toxicity of substances towards living organisms and the environment as a whole. 5. Selected physiological effects of toxic substances: effect on the nervous system, carcinogenic effects, teratogenic, immunosuppressive and allergic environmental pollutants. 6. Mechanisms of toxic action of selected groups of compounds, including: heavy metals, asbestos, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, bisphenols, dioxins and xenoestrogens.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Seminar - evaluation of a presentation lasting approximately 20 minutes on a selected topic in the field of toxicology	60.0%	40.0%
	Lecture - final test of about 10 questions, lasting 60 minutes	60.0%	60.0%
Recommended reading	Basic literature	1. Witold Seńczuk „Toksykologia Współczesna, PZWL, Warszawa, 2006 2. Sigmund F. Zakrzewski, Podstawy toksykologii środowiska, PWN 1997 3. Jerzy K. Piotrowski, Podstawy toksykologii, PWN, 2005	
	Supplementary literature	1. J. Lewin-Kowalik, Fizjologia człowieka. Podręcznik dla studentów kierunków medycznych, Edra Urban & Partner, 2024 2. C.H. Walker, S.P. Hopkin, R.M. Silby, D.B. Peakali, Podstawy Ekotoksykologii, PWN, Warszawa, 2002	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	What are the characteristics of the substances that make them toxic? What are the stages of metabolic transformations of xenobiotics getting into living organisms? How to determine the LD50 dose? Why are xenoestrogens dangerous contaminants?		
Work placement	Not applicable		

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