



Subject card

Subject name and code	Poisons and basics of toxicology, PG_00069269						
Field of study	Chemical Technology, Chemistry, Materials Engineering, Biotechnology, Corrosion						
Date of commencement of studies	February 2025	Academic year of realisation of subject				2025/2026	
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	2	Language of instruction				Polish	
Semester of study	3	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Sławomir Makowiec				
	Teachers		dr hab. Sławomir Makowiec				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	0.0	45
	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	45		5.0		25.0	75
Subject objectives	The aim of the course is to familiarize students with the basics of toxicology the mechanisms of xenobiotics entering the body, the pathways of their metabolism, understanding toxic effects at the molecular level and learning how to protect oneself against poisoning.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_W01] recognizes problems of modern chemistry, including properties and obtaining chemical compounds, necessary for making calculations, including the dependence of the compound's structure and its reactivity		Student possesses knowledge on how to handle toxic substances and prevent poisoning. They are familiar with the routes of entry of toxic substances. They also understand the mechanisms by which the main groups of toxic substances affect the human body.			[SW1] Assessment of factual knowledge	
	[K7_U01] integrates and interprets information from literature, databases and other sources		Student is able to find and apply information in the scientific literature on toxic substances, in particular on handling them, detecting them and protecting them against poisoning.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject	
	[K7_K01] is aware of the problems related to the profession of a chemist, is able to assess the effects of the activity performed		The student is aware of their responsibility for their own safety and that of others, as well as for the condition of the environment when working with hazardous substances, and is able to prevent accidents.			[SK5] Assessment of ability to solve problems that arise in practice	
	[K7_K03] can interact and work in a group, undertaking various roles within it		Student is able to work in a team during laboratory work involving the detection of toxic substances.			[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills [SK3] Assessment of ability to organize work	

Subject contents	<p>Course content – lecture Basic concepts and definitions in toxicology Toxokinetics: how substances behave in the body Toxodynamics: how substances damage cells A review of substances (not) commonly recognized as poisonous. Domesticated poisons: alcohol, nicotine, and legal highs: what is the mechanism of toxicity? Does herbal mean safe? Poisons of plant and animal origin. The top class of poisons: Chemical Warfare Agents: what was used to poison Sergei Skripal. Substances you wouldn't expect, or was Paracelsus right? The liver and kidneys in the crosshairs: what happens to internal organs during poisoning?</p> <p>Course content – laboratory Laboratory (teamwork - sample activities) Alkaloid Detection Synthesis of a safe organophosphate compound as a model for poison detection. Organophosphate Test Synthesis of an acetylcholinesterase reactivator, e.g., azoxime, pralidoxime, etc. Synthesis of a cyanide antidote.</p>											
Prerequisites and co-requisites	Basic knowledge of organic chemistry. Knowledge of spectroscopic and chromatographic techniques is desirable.											
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>test</td> <td>60.0%</td> <td>60.0%</td> </tr> <tr> <td>Successful completion of 3-5 practical laboratory tasks</td> <td>60.0%</td> <td>40.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	test	60.0%	60.0%	Successful completion of 3-5 practical laboratory tasks	60.0%	40.0%
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Recommended reading	<p>Basic literature</p> <p>Supplementary literature</p> <p>eResources addresses</p>	<p>Podstawy toksykologii Kompendium dla studentów szkół Jerzy K. Piotrowski Wydawnictwo Naukowe PWN</p> <p>An Introduction to Toxicology Philip C. Burcham Springer ISBN 978-1-4471-5553-9</p> <p>Toxicology of Herbal Products, Olavi Pelkonen, Pierre Duez, Pia Maarit Vuorela, Heikki Vuorela Springer ISBN 978-3-319-43806-1</p>										
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. What is the mechanism of brucine's toxic effects? 2. What compounds can be detected with Dragendorff's reagent? 3. What should be done in case of cyanide poisoning? 4. How do oximes regenerate acetylcholinesterase? 5. Are fluoroacetates dangerous? In what situations might they be encountered? 											
Practical activities within the subject	Not applicable											

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