University of Gdańsk

Subject card

Subject name and code	Toxicology, PG_00203485		
Field of study	Medical Biology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group 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	1	ECTS credits	2.0
Learning profile	academic	Assessment form	exam
Conducting unit	Laboratory of Toxicology and Radiation Protection -> Department of Environmental Chemistry and Radiochemistry -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Dagmara Strumińska-Parulska, prof. UG	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	0.0	0.0	0.0	0.0	20
	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	20	3.0	27.0	50

Subject objectives	
	• familiarizing students with basic toxicological terminology, • familiarizing students with the issues mentioned in the lecture program content.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDMU2_U03] is able to formulate and solve problems on the basis of the known laws and methods, including - using computer tools and statistical methods	He can formulate and solve toxicological problems based on the known principles and diagnostic methods, including the proper protection of materials for toxicological tests	[SU4] test/exam - oral or written
	[BIOLMEDMU2_W01] has an in-depth knowledge of scientific fields and disciplines relevant to medical biology and the studied specialty and knows their main development trends	1. Has in-depth knowledge about the impact of toxic substances on the human body. 2. Understands the goals and tasks of toxicology, terminology and basic concepts in the field of toxicology. 3. Knows the structure and toxicodynamic properties of selected xenobiotics.	[SW4] test/exam - oral or written
	[BIOLMEDMU2_W02] is familiar with current issues in medical biology and related disciplines	Knows the currently discussed toxicological problems	[SW4] test/exam - oral or written
	[BIOLMEDMU2_K07] is able to form opinions on various aspects of professional practice and is also able to foster entrepreneurship and innovation in their professional work	Is ready to formulate opinions on various aspects of professional activity in the field of risk assessment of xenobiotics in the human environment	[SK4] test/exam - oral or written
	[BIOLMEDMU2_U01] is able to use, fluently yet critically, the academic literature and databases required for work in the field of medical biology and related disciplines, and to prepare and present academic papers in the field of medical biology and related sciences	Can fluently, but in a critical way, use scientific literature in the field of toxicology	[SU4] test/exam - oral or written
	[BIOLMEDMU2_W03] has an in-depth understanding of the structure and functions of the human body, the biological causes of disorders, pathological changes and social dysfunctions, and the methods used to assess them using modern and current biochemical, molecular, parasitological or neurobiological techniques	Knows diagnostic methods of assessing exposure to loss of life and health by selected xenobiotics	[SW4] test/exam - oral or written
	[BIOLMEDMU2_U05] has the ability to speak in Polish or a foreign language at B2+ level and to discuss topics relating to their chosen specialism, as well as possessing the tools to engage in academic debate and the ability to adapt technical language to the appropriate audience	Has the ability to make oral presentations in Polish and discuss topics related to toxicolog	[SU4] test/exam - oral or written
	[BIOLMEDMU2_K02] is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek expert advice when having difficulty solving a problem on his own	Recognizes the importance of knowledge in solving cognitive and practical problems and consults experts in case of difficulties with independent problem solving	[SK4] test/exam - oral or written
	[BIOLMEDMU2_K01] is ready to critically evaluate himself, the teams in which he works and the content he receives	Is ready to critically assess himself (scope of competence) and received content in the context of toxicological matters	[SK4] test/exam - oral or written

<table>
<tr><td>Subject contents</td><td>History and milestones in toxicology. Toxicology tasks. Basic concepts, objectives and toxicological relationships. Poisons, poisonings - types and their causes. Basic concepts and toxicological relationships. Mechanisms of toxic action and detoxification mechanisms. Basic factors determining the possibility of harmful effects of xenobiotics on living organisms. Dose-effect relationship. The ways of absorption and excretion of poisons - their structure and the fate of the poison in the human body (ADME). Mechanisms of toxic action and detoxification mechanisms. Chemical safety - legal solutions. Toxicometry - testing of toxic effects (acute, cumulative, chronic toxicity, long-term effects of poisons - impact on reproductive capacity, mutagenicity, carcinogenicity, teratogenicity). Principles and scope of toxicometric tests, experimental animals, alternative methods of toxicity testing. Determination of safe values (NDS, NOAEL, LOAEL, ADI., MRL, MCL). Diagnostics of the most common poisonings: diagnosis of vital and fatal poisonings, multidirectional and targeted toxicological analysis, colors and smells of poisons, screening, confirming and evidence tests, diagnostic algorithm, time ranges of xenobiotics detection, interpretation of results, laboratory methods and instrumental techniques (thin layer chromatography, liquid chromatography, gas chromatography, mass spectrometry), indirect and direct methods of ethanol determination, post-mortem sobriety tests, properties and use of classic biological materials (blood and urine) and alternative materials (saliva, hair, nails, meconium); examination of the composition of physical evidence, proficiency testing and accreditation of diagnostic laboratories. Evaluation of the risk of exposure to the toxic effects of chemical compounds and its estimation. Poisonous plants and their active substances. Pesticide toxicity. Toxicity of selected heavy metals and their compounds. Alcohol. Pharmaceutical substances. Counterfeit drugs. Dietary supplements. Radiotoxicology.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
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<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>written exam</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>- Witold Seńczuk [red.], Toksykologia współczesna, wydanie I, PZWL, Warszawa 2012.

- Jerzy K. Piotrowski [red.], Podstawy toksykologii, WNT, Warszawa 2008.</td></tr>
<tr><td>Supplementary literature</td><td>-</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>lecture content</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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