GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Toxicology, PG_00053380		
Field of study	Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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 -> Wydziały Politechniki Gdańskiej		
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_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.	[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
[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

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

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture - final test of about 10 questions, lasting 60 minutes</td><td>60.0%</td><td>60.0%</td></tr>
<tr><td>Seminar - evaluation of a presentation lasting approximately 20 minutes on a selected topic in the field of toxicology</td><td>60.0%</td><td>40.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>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</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">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?</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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