1.	**Field of study**	**Biophysics**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2022/2023 (winter term), 2023/2024 (winter term), 2024/2025 (winter term), 2025/2026 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

Module: Selected Issues from Biomaterials Toxicology

Module code: W4-2BF-MB-21-28

1. Number of the ECTS credits: 2

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
MB_28_1	Understands the relationship between material properties and basic laws of nature	KBF_W01 KBF_W02	4 4
MB_28_2	Acquired basic knowledge about theoretical specification of material properties (specific heat, susceptibility etc.)	KBF_W02	4
MB_28_3	Analyses of various type computational approximations	KBF_U02	4
MB_28_4	Acquired the knowledge about materials electron structure, magnetism, dielectric and other properties	KBF_W01 KBF_W02	4 4
MB_28_5	Acquired the skill to resolve theoretical problems from the field of material properties computation	KBF_U02 KBF_U09	4 4
MB_28_6	Acquired the skill to apply specified computational methods and approximations	KBF_U02 KBF_U05 KBF_U06	4 4 4
MB_28_7	Analyses of various type approaches to theoretical determination of material properties	KBF_K10 KBF_U02	4 4

3. Module description

Description	This course will provide students with the issues related to biomaterials toxicology, including terms and definitions such as: toxin (poison), toxicity, degrees of toxicity, types of intoxications, adsorption of toxic substances and biocorrosion. The module shall ensure that students are knowledgeable

	about toxic action mechanisms and dynamics, based on which students shall understand the importance of biomaterials toxicity and its adverse effects of impact on the organism. Program: laboratory 1. Organization of classes. 2. Ways of distributing harmful compounds to the body. The effect of drugs on the presence of an implant in the body. The effect of alcohol on the presence of the implant in the body. 3. Effect of drugs on the presence of the implant in the body. Toxicity of metals found in titanium-containing biomaterials additives. Toxicity of metals present in 316L implant steel. 4. Diseases caused by the presence of metals in food. Toxicity of ceramic implants. Life expectancy of implants. 5. Toxicological assessment of cosmetic raw materials. Toxicity of plastics. Methods for determining metals in the material biological. 6. Methods of neutralizing poisons. Toxicity of metals and semimetals. 7. Toxicity of non-metals and their inorganic compounds. Toxicity of addictive substances (hallucinogens). 8. Written test / test. Program: lecture 1. Toxin (poison), toxicity, degrees of toxicity, types of poisoning. 2. Mechanisms of toxic action. 3. Adsorption of toxic substances. 4. Metabolic disorders caused by poisons. 5. Morphological disorders caused by poisons. 6. The carcinogenic response of a living organism to the implant. 7. Allergic reaction of the living organism to the implant. 8. Allergy mechanisms. 9. Allergies caused by implants. 10. Infection mechanisms caused by implanted materials. 11. Biocorrosion.
Prerequisites	

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
MB_28_w_1	exam	Verification of knowledge based on the content of the lectures, the indicated literature and the auditorium exercises	MB_28_1, MB_28_2, MB_28_3, MB_28_4
MB_28_w_2	credit	Verification of the knowledge acquired during the auditorium exercises	MB_28_5, MB_28_6, MB_28_7

5. Forms of teaching

code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
MB_28_fs_1	lecture	Detailed discussion by the lecturer of the issues listed in the table "module description". The lecture is conducted with the use of multimedia resources, based on a	30	Work with the selected literature including the independent acquisition of knowledge in relation to the issues covered in the lectures.	10	MB_28_w_1

		selected set of textbooks.				
MB_28_fs_2	laboratory classes	Based on the discussion and problem solving with the use of multimedia.	15	Preparation for exercises through self study of the indicated issues.	5	MB_28_w_2