

Subject card

Subject name and code	What does nanotechnology offer?, PG_00132885						
Field of study	Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject				
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish polish		
Semester of study	6		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Elżbieta Kamysz, prof. UG				
	Teachers		prof. dr hab. Elżbieta Kamysz, prof. UG				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	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		0.0		20.0	50
Subject objectives	The aim of the course is to familiarize students with the types of nanoparticles, methods of obtaining them and the possibilities of using nanomaterials in medicine and selected industries, as well as to draw attention to possible threats to human and animal health or the environment.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
		Knowledge - Student: • recognizes the types of nanoparticles and knows the methods of obtaining them; • can discuss about nanomaterials used in medicine and various industries; • indicates the risks that may arise from the use of nanomaterials. Skills - Student: • discusses issues related to the content of the lecture program in a correct and understandable manner, both orally and in writing; • makes a synthesis of data from various sources and draws appropriate conclusions on the possibility of using nanomaterials. Social competences - Student: • understands the need to independently search for information in scientific literature and popular science magazines; • understands the need to verify sources of scientific information; • knows the limitations of his own knowledge and understands the need for constant learning and development, and is open to new ideas.	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report [SK4] test/exam - oral or written
Subject contents	• Types and properties of nanoparticles. • Methods of obtaining nanostructures. • The use of microorganisms to obtain nanomaterials. • Biocompatibility testing of nanomaterials. • Examples of nanomaterials used in medicine (e.g. nanotechnology in tissue engineering and implantology, nanoparticles as drug carriers), agri-food industry (e.g. biosensors for identification of food adulterations, coatings covering the interior of household appliances to protect food against undesirable microorganisms, detection pathogenic microorganisms), cosmetics industry (e.g. cosmetics containing nanoparticles of substances protecting against UV radiation, nanoparticles as carriers of active substances), chemical industry and environmental protection, and nanomaterials still at the stage of scientific research. • Threats from nanomaterials.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test (open and closed questions) covering issues presented during the lecture	51.0%	45.0%
	presentation	75.0%	55.0%
Recommended reading	Basic literature	1. Publikacje naukowe i źródła internetowe wskazane na zajęciach przez prowadzącego;	
	Supplementary literature	1. Świat nanocząstek, red. K. Kurzydłowski, M. Lewandowska, W. Łojkowski, A. Świdorska-Środa, PWN, 2016; 2. Nanotechnologia w chemii i medycynie, Żelechowska, Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2014; 3. Nanobioinżynieria w praktyce wybrane zagadnienia, red. Nawrotka, Wydawnictwo Uczelniane Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie, Szczecin, 2021; 4. Biochemia, Stryer, Wydawnictwo Naukowe PWN, Warszawa.	
	eResources addresses		
Example issues/ example questions/ tasks being completed	no		
Work placement	Not applicable		

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