



Subject card

Subject name and code	Safety in Nanotechnology, PG_00072709						
Field of study	Nanotechnology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Optional subject group Humanistic-social subject group		
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		1.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Division of Ceramics -> Institute of Nanotechnology and Materials Engineering -> Faculty of Applied Physics and Mathematics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Aleksandra Mielewczyk-Gryń				
	Teachers		dr hab. inż. Aleksandra Mielewczyk-Gryń				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
	eNauczanie source addresses: Moodle ID: 8452 Bezpieczeństwo w nanotechnologii 2026/2027 https://enauczanie.pg.edu.pl/2025/course/view.php?id=8452						
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	15		2.0		8.0	25
Subject objectives	The aim of the course is to familiarize students with the hazards associated with the production, processing, and use of nanomaterials, with particular emphasis on potential risks to human health and the environment. During the course, students will learn methods for hazard identification and risk assessment, approaches to risk mitigation, and technical and organizational measures used to ensure the safe handling of nanomaterials. The course also covers national and international legal regulations concerning the safety, use, and handling of nanomaterials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems in a social environment		Is able to apply knowledge from the humanities, social sciences, or economics in the context of both physical security and intellectual property protection in the field of nanotechnology.		[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools		
	[K6_K71] is conscious of the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment		Is aware of the need to draw on knowledge from the humanities, social sciences, economics, and law in research work.		[SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness		
	[K6_W71] has general knowledge in humanistic, social, economic or legal sciences		Has general knowledge of the humanities, social sciences, economics, and law relevant to the conduct of scientific research.		[SW1] Assessment of factual knowledge		

Subject contents	Course content – lecture - Public perception of nanotechnology and the potential risks associated with its development and applications. - Potential health hazards resulting from exposure to nanomaterials. - Legal, technical, and organizational approaches to mitigating risks associated with the use of nanotechnology. - European Union regulations concerning nanotechnology and nanomaterials. - Regulations concerning chemical substances, with particular emphasis on nanomaterials. - Regulations concerning products containing or utilizing nanomaterials, including cosmetics, biocidal products, plant protection products, food and food-contact materials, medicinal products, and medical devices. - Principles for protecting workers from hazards associated with exposure to nanomaterials. - Environmental protection in the context of nanomaterials, including the protection of water, soil, and air, as well as waste management.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final	50.0%	100.0%
Recommended reading	Basic literature	1. Łopacka J. Półtorak A.: Zagrożenia związane z wykorzystaniem nanotechnologii w produkcji opakowań do żywności w świetle badań naukowych i w opinii konsumentów. Problemy Higieny i Epidemiologii 94 (2013) 172-178. 2. Zapór L.: Bezpieczeństwo i higiena pracy a rozwój nanotechnologii. Bezpieczeństwo i Higiena Pracy, nr 2 (2012) 4-7. 3. Nanotechnologies: a preliminary risk analysis on the basis of a workshop organized in Brussels on 12 March 2004 by the Health and Consumer Protection Directorate General of the European Commission. http://europa.eu.int/comm/health/ph_risk/events_risk_en.htm 4. Waszkiewicz-Robak B., Świderski F.: NANOTECHNOLOGIA KORZYŚCI I ZAGROŻENIA ZDROWOTNE. Bromatologia i Chemia Toksykologiczna 16, nr 3 (2008) 202-208	
	Supplementary literature	Jurewicz M.: Nanotechnologia. Regulacje prawne. Legislacja Unii Europejskiej. Difin 2014	
	eResources addresses		

Example issues/ example questions/ tasks being completed	• Characteristics of nanomaterials and the specific hazards arising from their size, morphology, and surface properties. • Routes of human exposure to nanomaterials: inhalation, dermal exposure, and ingestion. • Toxicity and ecotoxicity of nanomaterials. • Risk assessment related to the production, processing, and use of nanomaterials. • Methods for monitoring exposure to nanoparticles in the workplace. • Personal and collective protective measures when working with nanomaterials. • Principles for the safe storage, transport, and handling of nanomaterials. • Management of waste containing nanomaterials. • Impact of nanomaterials on water, soil, and air, and their fate in the environment. • EU regulations concerning nanomaterials, including requirements under REACH and CLP. • Regulations concerning nanomaterials in cosmetics, food, biocidal products, plant protection products, medicinal products, and medical devices. • Occupational health and safety in laboratories and facilities using nanomaterials. • Life-cycle assessment of nanomaterials in the context of safety and environmental impact. • Public perception of nanotechnology, risk communication, and acceptance of emerging technologies. • Case studies, incident analysis, and examples of good practices related to the safe use of nanomaterials.
Practical activities within the subject	Not applicable

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