

SDAŃSK UNIVERSITY 的 OF TECHNOLOGY

Subject card

Subject name and code	Environment protection, PG_00020943								
Field of study	Nanotechnology								
Date of commencement of studies	October 2021		Academic year of realisation of subject			2021/2022			
Education level	first-cycle studies		Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery			blended-learning			
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	Zakład właściwości m Materiałowej -> Facul	elektrycznych materiałów -> Instytut Nanotechnologii i Inżynierii ysics and Mathematics							
Name and surname	Subject supervisor		dr hab. inż. Jacek Ryl						
of lecturer (lecturers)	Teachers		dr hab. inż. Ja	acek Ryl	1				
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	15.0	0.0	0.0	0.0		0.0	15	
	E-learning hours included: 14.0								
	Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17312 Adresy na platformie eNauczanie: Ochrona Środowiska - Moodle ID: 17312 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17312								
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		1.0		9.0		25	
Subject objectives	Make students aware of the impact of human productive activity on the natural environment. Overview of the principles of sustainable development. Presentation of the role of engineers in developing tools and technologies allowing for more effective environment protection.								
Learning outcomes	Course out	Subject outcome			Method of verification				
	[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		the student understands the role of engineering and modern technologies to ensure sustainable development			[SK5] Assessment of ability to solve problems that arise in practice			
	K6_U10		The student is aware of the impact of nanomaterials on the environment at every stage of the life cycle			[SU5] Assessment of ability to present the results of task			
Subject contents	Human impact on the environment. Types and sources of water, soil and air pollution. Circulation of resources in the environment. Global, local and point environmental threats.Evolution of environmental protection. Environmental protection strategies: conservative, technological and planning.The idea of sustainable development. The role of material engineers in shaping changes, designing materials and technological processes.Available sources of energy, their harmfulness to the natural environment, materials and technologies related to obtaining energy, energy efficiency of processes.Maximizing the efficiency of using energy, time, mass and space.Principles of green chemistry, toxicity and biodegradability of materials, Protection against corrosion.Circular economy. Recycling. Process automation (drivers, management systems, monitoring).								

Prerequisites and co-requisites					
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade		
and criteria	Writing test	60.0%	60.0%		
	oral presentation	60.0%	40.0%		
Recommended reading	Basic literature	 J. Krystek, Ochrona środowiska dla inżynierów, PWN 2018 M. Popkiewicz i inni, Nauka o klimacie, Wydawnictwo Nieoczywiste, 2019 W. Adamczyk; Ekologia wyrobów; PWE 2004 Z. Kowalski, J. Kulczyńska, M. Góralczyk; Ekologiczna ocena cyklu życia procesów wytwórczych (LCA), PWN 2007 K. Małachowski; Gospodarka a środowisko i ekologia, CeDeWu, 2011 Z. Wnuk; Ekologia i ochrona środowiska. Wybrane zagadnienia., Wydawnictwo Uniwersytetu Rzeszowskiego, 2011 			
	Supplementary literature JCR articles				
	eResources addresses	Ochrona Środowiska - Moodle ID: 17312 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=17312			
Example issues/ example questions/ tasks being completed	The life cycle of the selected product. Types of impacts on the environment at the stage of manufacture of the selected material. The use of ecodesign principles on the example of the selected product.				
Work placement	Not applicable				