



Subject card

Subject name and code	Plastics recycling, PG_00039687						
Field of study	Materials Engineering, Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
Education level	second-cycle studies		Subject group		Optional 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		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Polymers Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Janusz Datta				
	Teachers		dr inż. Marcin Włoch				
			Joanna Niesiobędzka				
			dr inż. Paulina Kosmela				
			dr inż. Ewa Głowińska				
			Paulina Wiśniewska				
			prof. dr hab. inż. Janusz Datta				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		35.0	100
Subject objectives	Recycling and recovery plastic and rubber wastes education and practice knowledge						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K7_W06		Knows methods for separating waste of various polymeric materials. Can identify basic groups of plastics.		[SW3] Assessment of knowledge contained in written work and projects		
	K7_W07		Learns about energy recovery and depolymerization method. Learns the methods of multiple processing of thermoplastic materials		[SW3] Assessment of knowledge contained in written work and projects		
	K7_K02		Knows the validity of the recycling process		[SK2] Assessment of progress of work		
	K7_U06		Knows the ways of recycling waste polymer. Can choose recycling method to the stream waste.		[SU1] Assessment of task fulfilment		
Subject contents	Europe Union regulations for recycling of plastctics wastes. Systematics of plastics wastes regarding place of theirs formation and on possibility of reprocessing. Characteristics of waste from different types of industry. Identification of polymeric materials and methods of their separation. Thermal degradation and oxydation, photodegradation and biodegradation of plastics. Mechanical recycling of thermoplastics and rubber waste. Utilization of plastics waste. Chemical recycling of polyurethanes. Glycolysis of PUR and elastomers. Energy recovery from plastics and rubber waste.						
Prerequisites and co-requisites	Knowledge of production and chemical structure of main polymers; general knowledge of environmental protection.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture colloquium	50.0%	50.0%
	laboratory	50.0%	50.0%
Recommended reading	Basic literature	1) Praca zbiorowa pod redakcją A. Błedzkiego, Recykling materiałów polimerowych, WNT Warszawa 1997 2)Praca zbiorowa pod redakcją W. Parasiewicz, Elastomery, przemysł gumowy, IPG „Stomil” Piastów, ITPiB Politechniki Łódzkiej, Pistów – Łódz 2006 3) Praca zbiorowa pod redakcją A Prociak i in. Materiały poliuretanowe, PWN, Warszawa, 2014.	
	Supplementary literature	Poradnik „TWORZYWA SZTUCZNE W PRAKTYCE” 2007 Verlag Dashofer, Warszawa	
	eResources addresses	Adresy na platformie eNauczanie: Recykling tworzyw polimerowych (PG_00039687) - WYKŁAD + LABORATORIUM - 2023/2024 - Moodle ID: 34005 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34005	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		