



## Subject card

Subject name and code	Plastics recycling, PG_00039687						
Field of study	Materials Engineering, Materials Engineering						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
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		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_U06	Knows the ways of recycling waste polymer. Can choose recycling method to the stream waste.			[SU1] Assessment of task fulfilment		
	K7_K02	Knows the validity of the recycling process			[SK2] Assessment of progress of work		
	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_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		
Subject contents	Europe Union regulations for recycling of plastic wastes. Systematics of plastic wastes regarding place of their 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 oxidation, photodegradation and biodegradation of plastics. Mechanical recycling of thermoplastics and rubber waste. Utilization of plastic waste. Chemical recycling of polyurethanes. Glycolysis of PUR and elastomers. Energy recovery from plastic 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		
	laboratory	50.0%			50.0%		
	lecture colloquium	50.0%			50.0%		

Recommended reading	Basic literature	<p>1) Praca zbiorowa pod redakcją A. Błędzkiego, Recykling materiałów polimerowych, WNT Warszawa 1997</p> <p>2) Praca zbiorowa pod redakcją W. Parasiewicz, Elastomery, przemysł gumowy, IPG „Stomil” Piastów, ITPIB Politechniki Łódzkiej, Piastów – Łódź 2006</p> <p>3) Praca zbiorowa pod redakcją A Prociak i in. Materiały poliuretanowe, PWN, Warszawa, 2014.</p>
	Supplementary literature	Poradnik „TWORZYWA SZTUCZNE W PRAKTYCE” 2007 Verlag Dashofer, Warszawa
	eResources addresses	Adresy na platformie eNauczenie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	