GDAŃSK UNIVERSITY OF TECHNOLOGY

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. Błędzkiego, 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		