GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00065838		
Field of study	Materials Engineering		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Janusz Datta	
	Teachers	prof. dr hab. inż. Janusz Datta	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

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	30	5.0	40.0	75

Subject objectives

Familiarizing students with current technologies for the management of polymer waste (dedicated forms of recycling for waste from major production areas (electronics, automobiles, construction), including sorting, identification, and streamlining of waste, reuse of recyclates, Prerequisites and additional requirements Knowledge of the production and chemical structure of bulk polymers; general information on environmental protection

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K02] Is aware of the importance of non-technical aspects and effects of engineering, including the influence on the environment and resulting responsibility for the decisions.	The student understands the impact of various engineering decisions and activities on the natural environment.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U06] Can evaluate usefulness and feasibility of using new achievements (techniques and technologies) within the scope of materials science.	The student is able to assess the usefulness of new scientific achievements in the field of materials science.	[SU4] Assessment of ability to use methods and tools
[K7_W06] Knows the theoretical basics the functioning of scientific equipment in the fields of science and scientific disciplines relevant to materials engineering.	The student knows the basics of working with scientific equipment in the field of materials engineering.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
European Union regulations on plastic waste recycling. Sustainable development. Classification of plastic waste based on its place of origin and recyclability. Waste segregation and identification. Collection and recycling of polymer waste from the automotive, construction, electronics, and household industries. Biodegradation. Recycling of laminates and multilayer packaging. Eco-friendly design. Reuse of plastic waste. Alternative fuels.

Course content – laboratory
Performing tasks specified by instructors regarding the preparation of various streams of polymer waste, their examination, treatment, and processing.

Prerequisites and co-requisites

Knowledge of the production and chemical structure of bulk polymers; general information on environmental protection
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<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>pisemne zaliczenie</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>raport</td><td>100.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. A. Błedzki i innni. Odzysk i recykling materiałów polimerowych,Wydawnictwo Naukowe PWN, Warszawa, 2021

2. Praca zbiorowa pod redakcją A. Błędzkiego, Recykling materiałów polimerowych, WNT Warszawa 1997

3. Praca zbiorowa pod redakcją A Prociak i in. Materiały poliuretanowe, PWN, Warszawa, 2014.</td></tr>
<tr><td>Supplementary literature</td><td>Poradnik TWORZYWA SZTUCZNE W PRAKTYCE 2007
Verlag Dashofer, Warszawa</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1) Propose a method for the effective recycling of car seats.

2) Select a recycling technique and describe the necessary steps for recycling waste consisting of PA profiles and PS cups.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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