



## Subject card

Subject name and code	, PG_00037599						
Field of study	Green Technologies						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
Education level	first-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	4	Language of instruction			English		
Semester of study	7	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Polymers Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Justyna Kucińska-Lipka					
	Teachers	dr hab. inż. Justyna Kucińska-Lipka  dr inż. Marcin Włoch  dr inż. Ewa Głowińska					
Lesson types and methods of instruction	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		2.0		18.0	50
Subject objectives	The aim of the course is to familiarize students with the ecological aspects of recycling of packaging materials used in the pharmaceutical, medical and food industries, with issues related to the recycling of packaging materials, types of plastics used in various industries, as well as with legal acts normalizing the recycling process of these materials. Students will gain knowledge of ecological alternatives used in industry						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U05] can formulate and solve engineering tasks analytical methods, simulation as well as experimental, able to apply knowledge of basic physics and mathematics to analyze the results of experiments, is able to analyze and assess existing technical solutions						
	[K6_W03] has a basic knowledge of soil, air and water pollutants, design and supervision of environmentally friendly technologies and technologies which do not produce waste, knows technology of cleaning and neutralization of industrial waste and wastewater management, has a basic understanding of the theoretical basis of methods and types of apparatus used in chemical analysis of environmental pollutants						
Subject contents	As part of the course, students carry out the following issues. Types of packaging waste and places of their formation. Packaging waste generated in the Republic of Poland and the possibility of preventing its formation. Methods of recovery of post-consumer packaging. New biodegradable packaging materials. Recycling technologies of various types of packaging. National processing capacity of packaging materials. EU directives and regulations concerning the management of packaging waste. National system of packaging waste management.						

Prerequisites and co-requisites	The student knows the basic materials used in the packaging industry		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	laboratory	60.0%	40.0%
	test lecture	60.0%	60.0%
Recommended reading	Basic literature	Luciano Piergiovanni Sara Limbo Food Packaging Materials (2016)	
	Supplementary literature	<ul style="list-style-type: none"> <li>European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste</li> <li>Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 amending Directive 94/62/EC on packaging and packaging waste</li> </ul>	
	eResources addresses	Adresy na platformie eNauczanie: 2023 Ecological aspects of polymer package recycling{mlang} - Nowy kopiuj 1 - Moodle ID: 29612 <a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29612">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=29612</a>	
Example issues/ example questions/ tasks being completed	What is waste Please list methods for recycling packaging What are biodegradable materials		
Work placement	Not applicable		