COURSE DESCRIPTION CARD - SYLLABUS

Course name
Selected multi-layer waste recycling technologies [S1TOZ1>WTROW]

Course

Field of study
Circular System Technologies

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Basic knowledge of plastics and composite materials. The ability to obtain information from literature, databases, other properly selected sources. Understanding the need for training and improving one"s professional competences and the significance of the effects of engineering activities.

Course objective

Acquiring knowledge about the possibility of recycling and management of waste materials, with particular emphasis on multi-layer materials.

Course-related learning outcomes

Knowledge:
k_w06 - knows the principles of environmental protection related to chemical production and the management of raw materials, materials and waste in a closed cycle.
k_w07 - has basic knowledge of the neutralization and recovery processes of industrial and municipal waste.
k_w08 - has knowledge of the negative impact of manufacturing and processing technologies on the natural environment.

k_w12 - has a basic knowledge of the life cycle of products, devices and installations used in closed-loop technologies.
k_w13 - has the knowledge to describe the basic development trends related to closed-loop technologies.

Skills:
k_u01 - can obtain information from literature, databases and other sources related to closed-loop technologies, also in a foreign language, integrate them, interpret them, draw conclusions and formulate opinions.
k_u04 - has the ability to self-educate, is able to use source information in polish and a foreign language in accordance with the principles of ethics, reads with understanding, conducts analyzes, syntheses, summaries, critical assessments and correct conclusions.
k_u05 - correctly uses in the discussion and properly uses nomenclature and terminology in the field of circular economy, chemistry, technology and chemical engineering, environmental protection and related disciplines, also in a foreign language.

Social competences:
k_k09 - supports the idea of a harmonious, global civilization and economic development, promoting the principles of a circular economy, sustainable development and rational management of natural resources on a local and global scale.
k_k10 - is aware of the negative impact of human activity on the state of the environment and actively prevents its degradation.
k_k11 - understands the need to communicate to society - incl. through the mass media - full information about the benefits and challenges of implementing the circular economy concept.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
1. Rating of written exam.

Programme content

Multi-material packaging market- implementation of the obligation to recover and recycle. Characteristics of waste materials. Characteristics of multi-material packaging recovery and recycling installations. Recovery and recycling of packaging after hazardous substances..

Course topics

Multi-material packaging market.
Characteristics of waste materials.
Multi-material packaging introduced to the market. Market development directions.
Implementation of the obligation to recover and recycle multi-material packaging.
Waste treatment installations after multi-material packaging.
Characteristics of multi-material packaging recovery and recycling installations in Poland and in the world.
Recovery and recycling of packaging after hazardous substances.
Alternative methods of waste management, including multi-material waste.

Teaching methods

Lectures.

Bibliography

Basic
1. Rosik-Dulewska C., Podstawy gospodarki odpadami, Warszawa 2010.
Additional
1. Obyrn K., Odpady komunalne: zbiórka, recykling, unieszkodliwianie odpadów komunalnych i komunalnopodobnych: podręcznik dla studentów wyższych szkół technicznych, Kraków 2005

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	38	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	37	1,50