COURSE DESCRIPTION CARD - SYLLABUS

Course name
Waste disposal [S2TOZ1-RMiOC>SO]

Course

Field of study
Circular System Technologies

Year/Semester
1/2

Area of study (specialization)
Material recycling and chemical recovery

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

prof. dr hab. Piotr Krawczyk
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Lecturers

Prerequisites

The student has basic knowledge of chemical technology and processes of recycling, processing and management of used products. He uses basic techniques on a laboratory scale. The student is able to work individually and in a team, at the same time he/she feels the need for further education and improvement of his/her professional and personal competences.

Course objective

The purpose of the course is to acquire, and then deepen and consolidate knowledge and skills regarding the planning, preparation and actual storage of waste that cannot be recycled or recovered

Course-related learning outcomes

Knowledge:
1. Student has an extended knowledge to recognise and differentiate environmentally hazardous factors and knows the principles of waste neutralisation and recovery taking into account the requirements of a closed loop economy- [K_W06]
2. Student has a structured knowledge of sampling, sample storage and proper selection of analytical techniques for their determination - [K_W10]

3. Student has in-depth knowledge of methods of material recycling, raw material and energy recovery from waste materials necessary to design, optimise and implement innovative technological processes- [K_W12]

Skills:
1. Student has the skills to use the knowledge he/she possesses to identify and select methods of utilisation/management of various industrial wastes taking into account the principles of closed loop economy and to propose improvements to existing technological solutions taking into account the applicable legislation - [K_U03]
2. Student has the ability to qualify selected waste materials and to apply appropriate recycling and recovery techniques, in compliance with current legislation - [K_U11]
3. Student is able to assess the quality of reprocessed waste materials, as well as to qualify them for further use in various industries - [K_U13]

Social competences:
1. Student s aware of personal responsibility resulting from his/her professional role, and of the emergence of moral and ethical problems in the context of professional activities - [K_K01]
2. Critically evaluates one's knowledge, understands the need for further education and raising one's professional, personal and social competences - [K_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified by a written final exam (3 questions, duration - 1h), on-line colloquium if needed (25 test question). Passing threshold will correspond to 51% of the maximum number of points.
In the case of laboratory classes, the knowledge test will consist in the assessment of written answers in subjects related to the subject of practical classes, if necessary, an on-line exam (15 test questions). Passing threshold will correspond to 51% of the maximum number of points.

Programme content

1. Division and classification of waste.
2. Types of leaching tests.
3. The course of selected leaching tests.
4. Methods of evaluating the effectiveness of leaching tests.
5. Solidification and stabilization processes.
6. Types and course of selected solidification and stabilization processes.
7. Types of landfills and requirements for landfills.
8. Methods of preparing landfills for holding waste.
9. Assessment of risks and hazards of landfills.

Course topics

The class will be devoted to presenting issues related to the proper retention of waste that has not been recycled and/or recovered for various reasons. Emphasis will be placed on presenting a general breakdown of waste, with particular attention to those classified for landfilling. In the following part, issues related to the preparation of waste for landfilling will be discussed in a comprehensive manner, so that the process does not pose a threat to the environment. During the course, attention will be directed to presenting methods of preparing landfills to hold waste for the period of time needed to find effective ways of processing it into a form that allows practical use. A broad presentation of landfill issues will require a discussion of the risks accompanying the operation of landfills, both those relating to the type of waste stored and the conditions accompanying its long-term storage. To this end, the issue of the occurrence of risks arising from changes in the properties of stored waste under the influence of atmospheric factors will be presented, among other things.

Teaching methods

Lecture, problem lecture, explanation, classes, project method, laboratory exercises, didactic discussion.

Bibliography

Basic:
1. C. Rosik-Dulewska, Podstawy gospodarki odpadami, Wyd. PWN, 2015
2. B. Bilitewski, G. Hardtle, K. Marek, Podręcznik gospodarki odpadami. Teoria i praktyka, Wyd. Seidel Przywecki, 2006
3. J. Szyc, Odcieki ze składowisk odpadów komunalnych, Wyd. Instytytu Wiedza i Praktyka, 2003

Additional:
1. Praca zbiorowa, Gospodarka odpadami - konsekwencje wprowadzenia w życie nowych przepisów, Wyd. Wiedza i Praktyka, 2019
2. Praca zbiorowa, Kompendium wiedzy dla wytwórców odpadów, Wyd. Wiedza i Praktyka, 2023

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50