


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


<b>Course title</b>		<b>ECTS code</b>	
Diploma lecture - Waste conversion technologies		13.3.1156	
<b>Name of unit administrating study</b>			
null			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	pierwszego stopnia
Wydział Chemii	Chemia	<b>form</b>	stacjonarne
		<b>specjalty</b>	chemia biomedyczna, chemia kosmetyków, analityka i diagnostyka chemiczna, chemia żywności
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
dr inż. Anna Gołębiewska; dr inż. Aleksandra Pieczyńska; dr inż. Joanna Nadolna; dr inż. Anna Malankowska			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		2	
Lecture		classes - 30 h	
<b>The realization of activities</b>		tutorial classes – 5 h	
classroom instruction		student's work – 15 h	
<b>Number of hours</b>		Total: 50 h - 2 ECTS	
Lecture: 30 hours			
<b>The academic cycle</b>			
2024/2025 summer semester			
<b>Type of course</b>		<b>Language of instruction</b>	
obligatory		polish	
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
multimedia-based lecture		<b>Final evaluation</b>	
		Graded credit	
		<b>Assessment methods</b>	
		<b>The basic criteria for evaluation</b>	
		<ul style="list-style-type: none"> <li>positive assessment of the written test consisting of test and open questions covering the issues listed in the program content of the lecture; grade criteria in accordance with the UG Studies Regulations</li> </ul>	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b>			
none			
<b>B. Prerequisites</b>			
Basics of general chemistry			
<b>Aims of education</b>			
To acquaint students with waste processing technologies.			
<b>Course contents</b>			
<p>Definition and classification of waste. Types of methods and technologies of waste treatment: physicochemical, biological, and thermal. Basic processes, operations, and devices. Municipal waste - characteristics and technological properties. Industrial waste management. Mineral waste materials and technologies for their management. Energy waste. Technologies for the creation and use of fuels from waste. Thermal waste utilization. Characteristics, technologies, and handling of hazardous waste. Organic waste. Raw materials for biological processing. Technologies and products of waste fermentation. Waste composting technologies. Mechanical-biological waste treatment. Recycling technologies - material, raw material, and energy recycling. Methods of recovery and use of secondary raw materials. Recovery and recycling of polymeric materials. Methods of</p>			

asbestos waste utilization. Storage of waste. Waste avoidance options. Low-waste and non-waste technologies. Rational management of raw materials and waste. Economic and environmental aspects of waste management.

### Bibliography of literature

Bibliography of literature

Literature required to pass the course

- Rosik-Dulewska C., Podstawy gospodarki odpadami, PWN, Warszawa 2015

- Kasprzycka-Guttman T. (red.), Odpady stałe, ciekłe i gazowe – zapobieganie, powstawanie, utylizacja, OW Forest, Warszawa 2009

- Jędrzak A., Biologiczne przetwarzanie odpadów, PWN, Warszawa 2007

- Bilitewski B., Hardtle G., Marek K., Podręcznik gospodarki odpadami, Wydawnictwo Seidel Przywecki, Warszawa 2006

Extracurricular readings

- Wolny T. (red.pl) Sprawdzone metody gospodarowania odpadami komunalnymi, Stowarzyszenie Technologii Ekologicznych SILESIA, Opole 2010

- Wardasz A.J., Paliwa z odpadów. Technologie tworzenia i wykorzystania paliw z odpadów, PZLiTS, Poznań 2011

Kijeleński J., Łędzki A.K., Jeziórska R., Odzysk i recykling materiałów polimerowych

### The learning outcomes (for the field of study and specialization)

#### Knowledge

Student:

1. lists and defines the concepts of waste management.
2. lists and describes the processes used in the processing, use, and disposal of waste
3. describes the construction and operating principles of installations for physicochemical, biological, and thermal waste treatment
4. discusses the impact of waste production and processing technologies on the natural environment

#### Skills

Student:

- choose a management method for selected types of municipal and industrial waste,
- describes the environmental impact of selected waste treatment installations
- evaluate the effectiveness of the processes used in waste management;

#### Social competence

Student:

- is aware of the negative impact of waste on the environment.
- follows the safety rules in force in the chemical laboratory.
- collaborates in a team during laboratory tests and processing of results.
- links the importance of the development of waste management technologies for the good condition of the natural environment and human health

### Contact

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