



## Subject card

Subject name and code	Power Engineering of Waste Materials, PG_00042172						
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering						
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		Polish		
Semester of study	7		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Energy and Industrial Apparatus -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Bartosz Dawidowicz				
	Teachers		dr inż. Bartosz Dawidowicz				
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		3.0		17.0	50
Subject objectives	The aim of the course is to acquaint students with the waste management which is the energy use of waste as well as presentation of the physical fundamentals and construction of devices for thermal treatment of waste.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	K6_U08		The student is able to choose an effective technology for TTW with heat recovery.		[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W13		The student knows and describes the physical phenomena used in the thermal treatment of waste (TTW), knows the construction and principle of operation of the basic devices used in TTW.		[SW1] Assessment of factual knowledge		
Subject contents	LECTURE Thermal utilization of wastes. Burning and incineration of wastes. Basic constructions of incinerating wastes. Wastes gasification. Example reactions and process gasification types. Pyrolysis of wastes. Example reactions and process pyrolysis types. Construction of pyrolyzers. Plasma decomposition. Examples of plasma installations. Methods of utilization of secondary wastes. LABORATORY Departure to incinerating wastes, preparation of a study on the design of a TPO line for a selected type of waste.  preparation of a study on the design of a TPO line for a selected type of waste.						
Prerequisites and co-requisites	Knowledge of physics, chemistry and thermodynamics.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Lecture - Test		56.0%		75.0%		
	Laboratory - Test		56.0%		25.0%		
Recommended reading	Basic literature		1. Piecuch T.: Utylizacja odpadów przemysłowych, Wyd. Ucz. PK, Koszalin 20004. 2. Rybak W.: Spalanie i współspalanie biomasy, Oficyna Wyd. PWr., Wrocław 20065. 3. Bilitewski B., Härdtke G., Marek K.: Podręcznik gospodarki odpadami. Wyd. Seidel i Przywecki, W-wa, 2006				

	Supplementary literature	1. Thermal utilization of wastes - conference materials 2. Fuel from wastes - conference materials
	eResources addresses	Adresy na platformie eNauczenie: Energetyczne wykorzystanie odpadów W/L, En, I st., sem. 7, zima 23/24 (PG_00042172) - Moodle ID: 33997 <a href="https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33997">https://enauczenie.pg.edu.pl/moodle/course/view.php?id=33997</a>
Example issues/ example questions/ tasks being completed	1. What is the alternative fuel? 2. What are the thermal waste treatment processes? 3. The production of biogas.	
Work placement	Not applicable	