



## Subject card

Subject name and code	Thermal conversion technologies, PG_00055937						
Field of study	Power Engineering, Power Engineering, Power Engineering						
Date of commencement of studies	October 2023	Academic year of realisation of subject			2025/2026		
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	3	Language of instruction			Polish		
Semester of study	5	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						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	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 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_W06] knows classic and developmental energy technologies, rules for the selection and operation of heat and energy devices and installations, basic principles of energy systems operation, basic issues regarding the reliability of energy devices and diagnostics, environmental effects of energy technologies used, methods of using renewable energy sources	The student's knowledge includes knowledge of classical and renewable energy sources. He knows the physical laws of these processes. They presented the construction and operation of energy conversion devices. Has knowledge of the effects of both classic and renewable energy sources on the natural environment. He knows what are the limitations of the use of renewable energy sources and their profitability.			[SW1] Assessment of factual knowledge		
	[K6_U05] is able to formulate and carry out energy balances in devices and energy systems, also perform an energy audit of a simple building object, is able to perform a preliminary profitability analysis of a planned energy investment	The student performs energy calculations and makes balance energy systems. Based on data and calculations, it performs an investment profitability analysis.			[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_U08] can design the basic parameters of the selected technology related to energy conversion and select auxiliary devices and evaluate the project in terms of technical and economic	The student skillfully uses tools supporting engineering design. He independently carries out the project, makes correct calculations and interprets the obtained results			[SU3] Assessment of ability to use knowledge gained from the subject		
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 installationn. Methods of utilization of secondary wastes. LABORATORY Departure to incinerating wastes.						

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 eNauczanie:	
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		