GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2022	Academic year of realisation of subject	2024/2025
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	dr inż. Bartosz Dawidowicz	

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 familiarize students with the possibilities and technologies of thermal energy conversion and production of alternative fuels. Presentation of the basic physical foundations of the presented processes and construction of devices used for thermal conversion.

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

1. Basic concepts, fuels, combustion, energy conversion.2. Energy resources other than conventional and renewable.3. Technologies for producing and converting alternative fuels.4. Properties and usefulness of alternative fuels.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge of physics, chemistry and thermodynamics.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture - Test</td><td>56.0%</td><td>75.0%</td></tr>
<tr><td>Laboratory - Test</td><td>56.0%</td><td>25.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">1. Piecuch T.: Utylizacja odpadów przemysłowych, Wyd. Ucz. PK, Koszalin 20004. 2. Rybak W.: Spalanie i współspalanie biomasy, Oficyna Wyd. PWr., Wroclaw 20065. 3. Bilitewski B., Härdtke G., Marek K.: Podręcznik gospodarki odpadami. Wyd. Seidel i Przywecki, W-wa, 2006</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Thermal utilization of wastes - conference materials 2. Fuel from wastes - conference materials</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:
Technologie konwersji termicznej - Moodle ID: 42186
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=42186</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1. What is the alternative fuel? 2. What are the thermal waste treatment processes? 3. The production of biogas.</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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