GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Solar energy, PG_00055943		
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	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Waldemar Targański	
	Teachers		

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	42.0	75

Subject objectives

Familiarizing students with the parameters of solar radiation and the possibilities and ways of using solar radiation energy. Familiarizing students with the design and working principle of solar collectors and thermoelectric modules and their assemblies and installations on an individual and industrial scale.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W11] has knowledge of known technologies and non-technical aspects to solve simple engineering tasks in the field of energy systems and devices	The student has knowledge of the technologies learned and non-technical aspects to solve simple engineering tasks in the field of energy systems and devices.	[SW1] Assessment of factual knowledge
[K6_W10] knows the basic installations in the field of renewable energy sources and their impact on the environment	The student knows the basic installations in the field of renewable energy sources and their impact on the environment	[SW1] Assessment of factual knowledge
[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 knows: classical and developmental energy technologies, principles of selection and operation of thermal and energy equipment and installations, basic principles of energy systems operation, basic issues regarding the reliability of energy devices and diagnostics, environmental effects of energy technologies used, ways of using renewable energy sources.	[SW1] Assessment of factual knowledge

Subject contents

Solar radiation energy and its conversion methods. Liquid and air collectors and heating installations with solar collectors. Photovoltaic installations, their types and equipment. Characteristics of the operation of solar collectors and PV installations, taking into account the influence of operating conditions. Designing of solar installations.

Energy investigations of the solar collector. Tests of installations with photovoltaic cells.

<table>
<tr><td>Prerequisites and co-requisites</td><td>Physics

Thermal technology</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Assessment</td><td>56.0%</td><td>50.0%</td></tr>
<tr><td>Laboratory</td><td>56.0%</td><td>50.0%</td></tr>
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</td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Luque A., Hegedus S.: Handbook of Photovoltaic. Science and Engineering. Second Edition. John Wiley & Sons, Ltd. 2011.

Kalogirou S.: Solar Energy Engineering. 2014.

Waeli A. et al.: Photovoltaic/Thermal (PV/T) Systems: Principles, Design, and Applications. Springer. 2019.</td></tr>
<tr><td>Supplementary literature</td><td>Papers in journals</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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