



Subject card

Subject name and code	Renewable energy seminar I, PG_00037311						
Field of study	Technical Physics						
Date of commencement of studies	October 2021	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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Instytut Fizyki i Informatyki Stosowanej -> Faculty of Applied Physics and Mathematics						
Name and surname of lecturer (lecturers)	Subject supervisor	Łukasz Breńkacz					
	Teachers	Łukasz Breńkacz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	15.0	15
	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	15		2.0		8.0	25
Subject objectives	Consolidation of knowledge concerning the physical basics and specificity of operation of systems employing sources of the renewable energy. Improving the skills of preparing and presenting lectures on a given topic of renewable energy						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U07	He can present the basic facts of physics related to renewable energy in a popular way.			[SU1] Assessment of task fulfilment		
	K6_K05	Can communicate a selected issue in a communicative way and assess the lectures of other people.			[SK4] Assessment of communication skills, including language correctness		
	K6_U08	Has the ability to prepare oral presentations on a selected topic.			[SU1] Assessment of task fulfilment		
	K6_U01	Is able to independently obtain the source information on a selected topic of the lecture.			[SU1] Assessment of task fulfilment		

Subject contents	Presentation topics: <ol style="list-style-type: none"> 1. Energy generation systems with fuel cells. 2. Solar rays and their concentration. 3. Tracking systems in photovoltaic installations. 4. Types of photovoltaic systems. 5. Operating principle, properties, constructional and operational issues of vacuum collectors. 6. Ocean wave energy. 7. Power plants utilizing ocean tides. 8. Biomass power plants. 9. Geothermal energy. 10. Water electrolysis and biological methods of hydrogen production. 11. Hydrogen storage and transmission. 12. Operation of the airfoil profile. The force generated by airflow. 13. Wind turbines and wind power. 14. Rotordynamics of energy turbines. 15. Water energy. Energy conversion in a water turbine. 16. Development of wind turbines. 17. Fast reactors. 								
Prerequisites and co-requisites	Knowledge of mechanics, electricity and magnetism, quantum physics, and thermodynamics, within the scope of the basic academic course.								
Assessment methods and criteria	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Subject passing criteria</th> <th style="width: 25%;">Passing threshold</th> <th style="width: 25%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Assessment of the oral presentation: the content and the manner of its presentation.</td> <td>50.0%</td> <td>100.0%</td> </tr> </tbody> </table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Assessment of the oral presentation: the content and the manner of its presentation.	50.0%	100.0%		
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Assessment of the oral presentation: the content and the manner of its presentation.	50.0%	100.0%							
Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Chmielniak, T. (2021). Technologie energetyczne [eng. Energy technologies], 2 ed., PWN. 2. Goswami, D.Y i Kreith F. (2015). Energy efficiency and Renewable Energy handbook, 2 ed., CRC Press. 							
	Supplementary literature	<p>Twidell, J. (2021). Renewable energy resources, 4 ed., Routledge Taylor & Francis Group.</p> <p>Petit, V. (2017). The Energy transition: An overview of the true challenge of the 21st century, 1 ed., Springer.</p>							
	eResources addresses	Adresy na platformie eNauczanie: Seminarium z Odnawialnych Źródeł Energii - Moodle ID: 34485 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34485							
Example issues/ example questions/ tasks being completed	See list of topics.								
Work placement	Not applicable								