GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Renewable Energy Resources, PG_00042046		
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	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	3.0
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 mgr inż. Stanisław Głuch dr inż. Blanka Jakubowska mgr inż. Mariusz Furmanek	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	15.0	0.0	0.0	45

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

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	45	5.0	25.0	75

Subject objectives

Presentation of the modern achievements and tendencies in the area of renewable energy resources utilization. Classification of renewable energy resources. Possibilities of renewable energy resources utilization in Polish conditions. Discussion of theoretical backgrounds of selected technologies.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W06	The student's knowledge covers the knowledge of classical and unconventional energy sources. He knows the physical laws of these processes. He knows the construction and operation of energy conversion devices. He knows what is the environmental impact of the energy tenologies used.	[SW1] Assessment of factual knowledge
K6_U02	The student performs calculations related to energy conversion based on knowledge of thermodynamics, physics and fluid mechanics.	[SU3] Assessment of ability to use knowledge gained from the subject
K6_W10	The student has knowledge of the equipment and installations of renewable energy sources and knows the impact of these facilities on the environment.	[SW1] Assessment of factual knowledge

Subject contents	Energy resources. Ocean and see resources. Tidal energy. Wave energy. Osmotic energy. Ocean thermal energy conversion. Wind energy. Betz criterion. Aerogenerators. Hydro-power. Water turbines. Hydropower stations - types and characteristics. Geothermal energy. Dry rock and aquifer resources. Geothermal power stations and heat-generating plants. Solar energy. Solar collectors. Solar ponds. Solar "power tower". Solar "thermal tower". Photovoltaics. Exercises - estimation of the power of tidal-, wave- and osmotic power plant as well as OTEC cycle, - wind power, rotor diameter of aerogenerator, - calculation of the power of hydropower plant, - efficiency of geothermal power plant, - surface area and efficiency of solar collector Laboratory 1. Characteristics of solar collector 2. Characteristics of photovoltaic panel 3. Characteristics od micro-wind generator
Prerequisites and co-requisites	Thermodynamics, fluid mechanics, heat transfer

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Seminar	56.0%	30.0%
Test	56.0%	40.0%
Lab	56.0%	30.0%

Recommended reading	Basic literature	1. Mikielewicz J., Cieśliński J.T.: Niekonwencjonalne urządzenia i systemy konwersji energii. Maszyny Przepływowe pod red. E.S. Burki. Tom 24. IMP PAN, Ossolineum Wrocław 1999. 2.Cieśliński J.T.: Niekonwencjonalne urządzenia i układy energetyczne. Przykłady obliczeń. Wyd. PG 1997. 3. Lewandowski W.M.: Proekologiczne źródła energii odnawialnej. WNT W-wa, 2001. 4 Twidell J.W., A.D Weir: Renewable energy sources. London: Chapman and Hall 1990
	Supplementary literature	Journal Czysta Energia
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Physical properties of renewable sources 2. OTEC system 3. Classification of hydro power plants and their advantages 4. Types of geothermal sources and scheme of the binary power plant 5. Features of wind/electricity generating systems 6. Solar constant	
Work placement	Not applicable	