GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Environment protection in power engineering, PG_00055865		
Field of study	Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Sanitary Engineering -> Faculty of Civil and Environmental Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Sylwia Fudala-Książek	
	Teachers	dr hab. inż. Sylwia Fudala-Książek dr inż. Hubert Byliński	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	0.0	45
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	45	3.0	27.0	75

Subject objectives	Presentation of the main functions of the atmosphere and environmental protection laws. Characteristics of the current state of the environment. Presentation of the latest achievements and trends in the field of the use of renewable energy sources, their classification, as well as an indication of the possibility of their use, with particular emphasis on Polish conditions. Presentation of the mechanisms of operation of devices for energy conversion and examples of technical solutions, showing students the directions of energy saving.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U12] can correctly choose tools (analytical or numerical) to solve engineering problems filtration processes, and data analysis; is able to use photogrammetric and remote sensing tools in engineering tasks in the field of geodetic techniques and metrology	The student has knowledge of measuring tools, energy acquisition and installation of renewable energy sources, and knows what is the impact of these objects on the environment.	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_K04] is able to formulate opinions on technical and technological processes in energy and sanitary engineering	The student knows the basics and uses issues in the field of technological processes in the energy sector.	[SK4] Assessment of communication skills, including language correctness
[K6_U09] knows and applies the basic provisions of construction law, water law and environmental law; can determine the impact of construction investments on the environment	The student's knowledge includes knowledge on construction law, water law and environmental law. The student knows what is the environmental impact of the applied energy ethnology.	[SU2] Assessment of ability to analyse information
[K6_W17] has an elementary knowledge on land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, student knows the principles and organization of sustainable resource management within a circular economy	The student is able to apply the learned mathematical methods for analysis and design components, circuits and systems energy. The student is able to use the acquired knowledge about the state of the environment and apply it in practice.	[SW1] Assessment of factual knowledge

Subject contents

The main functions of the atmosphere, characteristics of the current state of the environment, RENEWABLE ENERGY SOURCES (RES) - energy and its types, passive and active RES utilization systems, basics of thermodynamics, thermal energy of the seas and oceans, geothermal energy, energy storage, biomass, biogas, fuel cells, directions of energy saving, basic environmental protection laws, use of RES in the Pomeranian Voivodeship

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Calculating exercises/Presentation	60.0%	50.0%
Colloquium	60.0%	50.0%

Recommended reading

Basic literature	R. Aranowski, W.M. Lewandowski, Environmental protection technologies in industry and energy, Polish Scientific Publishers PWN, Warsaw 2020 W.M. Lewandowski, E. Klugmann-Radziemska, Pro-ecological renewable energy sources, Polish Scientific Publishers PWN, Warsaw 2007 B. Viswanathan, An Introduction to Energy Sources, Indian Institute of Technology 2006
Supplementary literature	Jerzy Kucowski, Damazy Laudyn, Mieczysław Przekwas, Energy and environmental protection, Scientific and Technical Publishers, catalog number MR01279102 J. S. Goldstein, S.A. Qvist, Energy for the climate, Polish Scientific Publishers PWN, Warsaw 2020
eResources addresses	Adresy na platformie eNauczanie: Ochrona środowiska w energetyce - Moodle ID: 26471 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26471

Example issues/ example questions/ tasks being completed

Renewable energy sources - what kind of investment should be made in Poland, taking into account the general characteristics and natural conditions, "Biomass as potential" - characteristics and examples of biomass use, characteristics and examples of solar, water and wind energy use, geothermal energy - characteristics and examples of application, the use of renewable energy sources in terms of environmental protection, characteristics of activities aimed at stopping environmental degradation, characteristics and directions of development of nuclear energy, hydrogen as a fuel of the 21st century, comparison of geothermal energy with conventional

Work placement	Not applicable