GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	RENEWABLE ENERGY SOURCES - A TEAM PROJECT, PG_00061327		
Field of study	Engineering Management		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
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	2	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Informatics in Management -> Faculty of Management and Economics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Redlarski	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	30.0	0.0	60

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	60	4.0	61.0	125

Subject objectives

The aim of the course is to familiarize students with the issues of renewable energy sources in the context of sustainable development. In the project, students will acquire the ability to assess the primary energy demand of buildings using various energy sources (conventional and unconventional) and determine the impact of the solutions used on the economic and environmental effects.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W06] classifies the obtained information, evaluating its usefulness to solve the formulated problems	compares various sources of renewable energy, taking into account technical, economic and environmental aspects, assessing their suitability in a specific situation	[SW1] Assessment of factual knowledge
[K6_U03] demonstrates professional and effective teamwork, both as a leader and as a team member	designs concepts for effective use of renewable energy sources, for given assumptions, working as a team	[SU1] Assessment of task fulfilment
[K6_K02] makes competent and ethical decisions to create and maintain economic, social and environmental values	makes competent decisions taking into account economic, social and environmental values	[SK5] Assessment of ability to solve problems that arise in practice

<table>
<tr><td>Subject contents</td><td>LECTURE
Issues of energy production in Poland
Problems of energy demand and storage
Current legal conditions
Renewable energy sources, types, characteristics
Wind energy
Water energy
Solar energy
Biomass energy
Geothermal energy
Nuclear energy
Energy audit and its importance
Passive construction and energy efficiency issues
Economic calculation in the power industry
Ecology and renewable energy sources
Standardization, certification and sustainable development in the energy sector
PROJECT
Initial assumptions for the project, software characteristics
Energy performance calculation methodology
Characteristics of the building and the choice of calculation method
Definition of external and internal partitions
Analysis of the building's demand for thermal energy
Analysis of energy demand for heating and ventilation
Analysis of energy demand for heating domestic hot water
Analysis of energy demand for cooling
Analysis of energy demand for lighting
Preparation of the building's energy performance certificate
Ecological comparative analysis - stage I and II
Economic comparative analysis stage I I II
Generating the final report</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Test</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Project</td><td>60.0%</td><td>60.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Ligus, M. (2022). Efektywność inwestycji w odnawialne źródła energii: analiza kosztów i korzyści. CeDeWu. Wydawnictwa Fachowe
Dończyk, M., Korzon, M., Skibicki, O., & Stupak, M. (2022). Odnawialne źródła energii: poradnik dla inwestorów oraz wytwórców energii. Wolters Kluwer
Lewandowski, W. (2006). Proekologiczne odnawialne źródła energii. Wydawnictwa Naukowo-Techniczne
Kamrat W. (2022). Gospodarka energetyczna w warunkach rynkowych. Wydawnictwo Naukowe PWN</td></tr>
<tr><td>Supplementary literature</td><td>Trzciński, M. (2013). Projektowanie budynku w technologii BIMstudium przypadku (Doctoral dissertation, Instytut Budownictwa)
Gawin, D., & Sabiniak, H. G. (Eds.). (2010). Świadectwa charakterystyki energetycznej: praktyczny poradnik. ArCADiasoft Chudzik
Kwiatkowski, J., & Wiszniewski, A. (2022). Nowe funkcjonalności w systemie świadectw charakterystyki energetycznej budynków. Materiały Budowlane</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>• Analyze the energy performance of the selected building.
• Propose several variants of modernization of an existing building to make it passive, taking into account the use of selected renewable energy sources.
• Determine which of the thermal modernization variants is the most beneficial in terms of the economic effect and which is the most beneficial in terms of the environmental effect.
• What renewable energy sources are the most beneficial to use in Poland. Justify your answer and provide examples of such installations in our country.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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