GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy Use Rationalization, PG_00042075		
Field of study	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	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	3	Language of instruction	English
Semester of study	5	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Jaskólski	
	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	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	5.0	15.0	50

Subject objectives

Acquisition of technical and economic calculations skills for energy technologies and energy saving projects.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[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	Development of technical-economic analysis of selected technology, using renewable energy source, fossil fuels or nuclear energy.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K6_W10] knows the basic installations in the field of renewable energy sources and their impact on the environment	Development of technical-economic analysis of selected technology, using renewable energy source, fossil fuels or nuclear energy.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Energy policy of the European Union and Poland. Legal documents and support programs for energy efficiency. Measures to improve energy efficiency. Energy audit. Certificate of energy performance of the building. Heat for the needs of buildings. Thermomodernization. Electric drives. Cogeneration. Indicators of energy efficiency assessment. Cost analysis and static and dynamic methods of assessing cost-effectiveness in energy. Technical and economic analysis of the selected technologies using renewable energy resources, fossil fuels or nuclear energy.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Analytical study and its presentation	60.0%	100.0%

Recommended reading	Basic literature	European Standard Energy Audits (EN 16247-1) Thumann A., Dunning S., Plant Engineers and Managers Guide to Energy Conservation, CRC Press, 2011
	Supplementary literature	OECD IEA/NEA, Projected costs of generating electricity, 2015 Edition, Paris, 2015 D. Kirschen, G. Strbac, Fundamentals of power system economics, John Wile & Sons, Ltd, Chichester, 2004. doi:10.1002/0470020598. M. Jaskólski, Modelling long-term technological transition of Polish power system using MARKAL: Emission trade impact, Energy Policy. 97 (2016) 365–377. doi:10.1016/j.enpol.2016.07.017. M. Jaskólski, A. Reński, T. Minkiewicz, Thermodynamic and economic analysis of nuclear power unit operating in partial cogeneration mode to produce electricity and district heat, Energy. (2017). doi:10.1016/j.energy.2017.04.144.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Calculation of electricity production in selected technology. 2. Calculation of primary or secondary energy consumption by manufacturing technology. 3. Calculating the environmental effects of energy production and use. 4. Calculation of cost and profitability indicators for selected energy technology.	
Work placement	Not applicable	