GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy audit, PG_00055936		
Field of study	Audyt energetyczny		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Thermal Power Systems -> Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Jacek Barański	
	Teachers	dr hab. inż. Jacek Barański	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	2.0	18.0	50

Subject objectives

The aim of the course is to learn the principles of energy audits of buildings and industrial facilities.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W11] has knowledge of known technologies and non-technical aspects to solve simple engineering tasks in the field of energy systems and devices	Participants gain knowledge about the technologies they have learned about, as well as non-technical aspects of solving simple engineering tasks in the field of analysing the operation of energy devices and systems.	[SW1] Ocena wiedzy faktograficznej
[K6_U05] is able to formulate and carry out energy balances in devices and energy systems, also perform an energy audit of a simple building object, is able to perform a preliminary profitability analysis of a planned energy investment	The participant is able to perform an energy audit of a device or building. In addition, they are able to perform a preliminary cost analysis of a planned energy investment.	[SU4] Ocena umiejętności korzystania z metod i narzędzi
[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	Participants acquire knowledge related to the basic principles of industrial equipment and systems, the environmental impact of energy equipment and systems, and the potential for using renewable energy sources.	[SW1] Ocena wiedzy faktograficznej
[K6_K04] is able to formulate opinions on technical and technological processes in energy and sanitary engineering	The participant is able to formulate opinions on the course of technical and technological processes in energy systems and sanitary engineering.	[SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce

Subject contents	Lecture: Energy standards of buildings. Thermal comfort. Calculations of heat losses and gains. Energy demand. Energy needs of buildings (heating, hot water preparation, ventilation and lighting). Principles of performing energy audits of buildings and industrial objects. Laboratory:Calculation of heat demand for a building using Audytor OZC software. Formulating thermomodernization projects and determining optimal thermomodernization improvements.
Prerequisites and co-requisites	Basic knowledge of technical drawing, mathematical calculations, basics of heat transfer processes. Student can obtain information from literature, databases and other properly selected sources; also in English in the field of energy, is able to integrate the information obtained from many fields, interpret and critically evaluate it, as well as draw conclusions and formulate and exhaustively justify opinions. He is ready to critically assess and analyze issues and recognizes the importance of knowledge in solving cognitive and practical problems in the field of energy.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test	56.0%	80.0%
laboratory report	56.0%	20.0%

Recommended reading

Basic literature

1. Aktualne przepisy prawne obowiązujące w zakresie sporządzania audytu energetycznego oraz świadectw charakterystyki energetycznej budynków (ustawy, rozporządzania)

2. Ogrzewnictwo praktyczne, Halina Koczyk, Bronisława Antoniewicz i inni Systherm 2014

3. Dydenko J.: Charakterystyka energetyczna i audyt budynków przepisy z wprowadzeniem. Wydawca: Wolters Kluwer 2009

4. Górzyński J.: Podstawy analizy energetycznej obiektów budowlanych. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa 2012

5. Kurtyn K., Gawin D.: Certyfikacja energetyczna budynków mieszkalnych z przykładami. Wydawnictwo: Wrocławskie Wyd. ALTA2

6. Laskowski L.: Ochrona cieplna i charakterystyka energetyczna budynków. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005

7. Lejdy B.: Instalacje elektryczne w obiektach budowlanych. Wydawnictwa Naukowo Techniczne

8. Mizielińska K., Olszak J.: Gazowe i olejowe źródła ciepła małej mocy. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005

9. Ulbrich R.: Audyt energetyczny a dom energooszczędny. Oficyna Wydawnicza Politechniki Opolskiej. Opole 2000

	Supplementary literature	1. Halina Koczyk , Bronisława Antoniewicz: Nowoczesne wyposażenie techniczne domu jednorodzinnego Instalacje sanitarne i grzewcze 2. Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Definition of an energy audit. Types of energy audits and methods of conducting them. Ways to reduce heat demand in residential and industrial buildings.	
Practical activites within the subject	Not applicable	

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