GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy Auditing (WEiA), PG_00042097		
Field of study	Power Engineering, Power Engineering		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	4	Language of instruction	English
Semester of study	7	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marcin Jaskólski	
	Teachers		

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	5.0	65.0	100

Subject objectives

The aim of the course is to acquire skills in technical and economic analysis of projects aimed at more efficient use of energy.

Learning outcomes

Course outcome	Subject outcome	Method of verification

Subject contents

Course content – lecture
Calculation of the amount of energy produced in the energy system. Calculation of the amount of electricity consumed. Energy consumption profiles. Power generation profiles. Profitability analysis for a project aimed at more efficient use of energy: discounting, averaging in the discount account, depreciation and cost of equity, bank loans and related costs, weighted average cost of capital WACC , analysis of annual costs, assessment of operating costs in the energy sector, static and dynamic profitability methods, accounting rate of return ARR, break-even point BEP, net present value NPV, internal rate of return IRR, discounted payback period DPBP, levelised cost of electricity LCOE.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Techno-ekonomic analysis	60.0%	50.0%
Final test	60.0%	50.0%

Recommended reading

Basic literature

NEA, IEA, Projected costs of generating electricity 2015 edition

European Standard Energy Audits (EN 16247-1)

Thumann A., Dunning S., Plant Engineers and Managers Guide to Energy Conservation, CRC Press, 2011

	Supplementary literature	Jaskólski M., Modelling long-term technological transition of Polish power system using MARKAL: Emission trade impact, Energy policy 97 (2016), pp. 365-377 Jaskólski M., Reński A., Minkiewicz T., Thermodynamic and economic analysis of nuclear power unit operating in partial cogeneration mode to produce electricity and district heat, Energy 141 (2017), pp. 2470-2483 D. Kirschen, G. Strbac, Fundamentals of power system economics, John Wiley & Sons, Ltd, Chichester, 2004. doi:10.1002/0470020598.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Calculate the annual costs of generating electricity in a nuclear power plant. 2. Calculate the unit cost of generating electricity in a wind farm. 3. Calculate the capital costs for the investment consisting in the construction of a coal-fired power plant. 4. Calculate the net present value of the steam and gas power plant at the set values of technical and economic indicators.	
Practical activites within the subject	Not applicable	

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