GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Energy Auditing (WEiA), PG_00042097		
Field of study	Power Engineering, Power Engineering, Power Engineering, Power Engineering, Power Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2023/2024
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		
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	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
K6_U05	They can perform a preliminary analysis of the profitability of the planned energy investment.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
K6_U01	They can use literature in English to complete a task.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
K6_W06	They can perform investment analysis of a classic and modern power generation system.	[SW3] Assessment of knowledge contained in written work and projects

Subject contents

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
Final test	60.0%	50.0%
Techno-ekonomic analysis	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	Adresy na platformie eNauczanie:
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.	
Work placement	Not applicable	