



Subject card

Subject name and code	Energy Use Rationalization, PG_00042067						
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			2022/2023		
Education level	first-cycle studies	Subject group					
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	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Paweł Bućko					
	Teachers	dr hab. inż. Paweł Bućko					
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	3.0		17.0		50
Subject objectives	Basic knowledge of energy saving projects implementation.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U04	The student is able to design an energy-saving modernization. Is able to carry out a technical and economic analysis of energy-saving projects. Is able to analyze investment profitability.			[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W06	The student is able to identify energy technologies. He can keep an efficiency account. He can calculate energy consumption and prepare energy balances.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Energy consumption in Poland in comparison with other European countries. Institution and regulation that support energy conservation in Poland. Electricity conservation in household sector. Structure of energy consumption. Energy efficient equipment. Promotion of energy effectiveness. Systems of energy labels and certificates. Stand-by energy consumption and ways of reduction of stand-by losses. Energy efficient equipment in houses. Typical energy conservation solutions. Ways of promotion of energy conservation techniques in household sector. Energy efficient lighting systems. Parameters of lighting systems. Rules of proper lighting of inside areas, motor ways and roads, work areas. Energy efficient light sources (lamps) and luminaires. Energy efficient lighting systems projecting. Lighting control systems. Typical energy conservation solution in indoor and outdoor lighting systems. Audit of lighting systems. Lighting effectiveness coefficients. Energy conservation in industry. Energy efficient motors (EEM) standard: usage of EEM, calculating of economic effectiveness of EEM. Energy efficient transformers. Optimization of transformers operation in parallel operation. Electronic control systems for electrical motors. Energy distribution companies activities in energy effectiveness and conservation promotion. Demand Side Management (DSM) – aims and techniques. Integrated system development planning. Electricity tariffs – tariffs constructions rules and payments. Choosing the best tariff solution for consumer. Optimization of capacity payments.						
Prerequisites and co-requisites	Basic of Energy economics						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Project	60.0%			100.0%		
Recommended reading	Basic literature	1. Górzyński J.: Audyting energetyczny. Fundacja Poszanowania Energii, Warszawa 2001. 2. Szargut J. i inni: „Racjonalizacja użytkowania energii w zakładach przemysłowych”, Fundacja Poszanowania Energii, Warszawa 1994.					

	Supplementary literature	<ol style="list-style-type: none"> 1. Nowak E.: „Racjonalizacja gospodarki energia elektryczną w zakładach przemysłowych”, Fundacja Poszanowania Energii, Warszawa 1997. 2. Stępniewski M.: „Energooszczędne oświetlenie dróg”, Fundacja Poszanowania Energii, Warszawa 1994
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Racjonalizacja użytkowania energii [2022/23] - Moodle ID: 26435 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=26435</p>
Example issues/ example questions/ tasks being completed	Analyse of a chosen energy saving modernization project.	
Work placement	Not applicable	