



Subject card

Subject name and code	Electric Energy Market, PG_00042193						
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			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	6	ECTS credits			1.0		
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	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	Rules of electrical market operation. Knowleges of customers, producers and turnovers roles on energy market.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U05	The student is able to create energy budgets for facilities. Can calculate energy delivery costs based on tariffs. He can choose the appropriate variant of tariff settlements for the recipient.			[SU1] Assessment of task fulfilment		
	K6_W07	The student knows the principles of operation of the energy market. He can distinguish between types of transactions on the wholesale energy market. He knows the basic principles of creating purchase portfolios.			[SW3] Assessment of knowledge contained in written work and projects		
Subject contents	Costs and prices calculation in energy sectors brief rules. Structure of electrical energy market. Market participants. Natural monopoly. Liberalization on energy markets. The Polish energy law regulation. Energy policy. Role of Regulation Office on energy markets. Brief classification of different markets segments. Electrical energy tariffs. Rules of tariffs construction. Rates in tariffs for final consumers. Tariffs of distribution companies. Minimization of electricity purchase cost by consumers. System operator and his role on energy market. The operators tariff. Purchase of electricity by distribution companies. The Polish Power Exchange rules of electricity turnover, position on energy market, energy prices, binding rules. The Balancing Market role of the Balancing Market, rules of energy turnover, energy prices, influence on other energy markets. Competitive energy markets in Poland. Other possible structure of markets (pool, Single Buyer). Local and whole-system markets. The transmissions services market. The TPA (Third Party Access) rule in Europe. The transmissions tariffs and rates. Tariffs construction cost calculation (marginal costs versus bounded costs). Ancillary services on energy market. The power reserves. Ancillary services in power and frequency control. Voltage control. Black start readiness. Island operation of subsystem. Ancillary service purchase by operator. Problems of ancillary services cost allocation.						
Prerequisites and co-requisites	Brief knowledge of power system structure and operation						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Midterm colloquium	50.0%			100.0%		

Recommended reading	Basic literature	Mielczarski : Rynki energii elektrycznej. ARE, Warszawa - Wrocław 2001. Weron, Weron : Giełda energii strategie zarządzania ryzykiem. CIRE, Wrocław 2000. Gładys, Matla : Praca elektrowni w systemie elektroenergetycznym. WNT, Warszawa 1990.
	Supplementary literature	Toczyłowski : Optymalizacja procesów rynkowych przy ograniczeniach. WPW, Warszawa 2004. Kalinowski, Malko, Szalbierz, Wilczyński : Efektywność międzynarodowego handlu energią elektryczną. Kaprint, Lublin 1999.
	eResources addresses	Adresy na platformie eNauczanie: RYNEK ENERGII ELEKTRYCZNEJ [EE][2022/23] - Moodle ID: 28608 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28608
Example issues/ example questions/ tasks being completed	<p>Calculation of the Balancing Market participation costs.</p> <p>Price calculation basing on Energy Exchange offers.</p> <p>Calculation of tariffs payments.</p>	
Work placement	Not applicable	