



Subject card

Subject name and code	Forecasting the operation and planning the development of the energy sector, PG_00064758						
Field of study	Power Engineering						
Date of commencement of studies	February 2025	Academic year of realisation of subject			2025/2026		
Education level	second-cycle studies	Subject group			Specialty 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	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
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						
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	15.0	45
	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	45		7.0		48.0	100
Subject objectives	The aim of the course is to acquire the ability to make and use energy forecasts. Solving basic forecasting issues for future demand for different cycles of variation. Ability to formulate planning issues: defining purpose and constraints. Analysis of development problems in energy systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study		can plan the implementation of new technologies in forecasts and development plans for energy systems		[SW3] Assessment of knowledge contained in written work and projects		
	[K7_U14] integrates information obtained from literature and other properly selected sources, including those in a foreign language, creatively interpreting and critically evaluating them, and drawing conclusions		can acquire and use information from literature, databases and other sources		[SU2] Assessment of ability to analyse information		
	[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment		can explain the need to use knowledge in the field of economic sciences to function in a professional and social environment		[SK2] Assessment of progress of work		
	[K7_U15] evaluates the feasibility of advanced methods and tools for solving complex engineering tasks of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose		can integrate analysis technical and economic use of different energy technologies		[SU1] Assessment of task fulfilment		

Subject contents	Stochastic nature of energy load variability. Basic factors shaping the load course over time. Division of energy forecasts according to the planning horizon. Basic applications of energy forecasts. Application of simple extrapolation of past trends in energy forecasting. Econometric models used in forecasting. Methods of forecasting daily load variability used in KDM. Methods of forecasting weekly and annual load variability used in KDM. Seasonal load variability models. Component functions of the process. Static and dynamic variability. Forecasting the variability process of power demand. Applications of multiple regression to forecasting in the energy industry. Multiple correlation coefficient (R). Analysis of the impact of independent variables on the regression equation. Applications of neural networks to forecasting. Planning the level of power reserve in the system. Statistical method used to determine electricity production plans by power plants and combined heat and power plants in individual months of the year. Planning repairs. Classification of power unit repairs. Optimization of inter-repair periods for units. Factors influencing the duration of a repair for a selected block. Problems of forecasting the development of the generating system. Consideration of the demand side in programming the development of energy. Integrated Planning of System Development.		
Prerequisites and co-requisites	Basic knowledge of energy management		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written work	60.0%	100.0%
Recommended reading	Basic literature	Armstrong J.,S.: Principles of Forecasting. Norwell, 2001.	
	Supplementary literature	Box P., Jenkins G.: Time Series Analysis: Forecasting and Control. Holden-day Inc., San Francisco, 1976.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Forecasting daily variability of the load power. Setting a long-term trend in demand for power and energy. Forecast of peak load and its temporal variability.		
Work placement	Not applicable		

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