GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Forecasting and Developmental Planning in Power Engineering, PG_00046002		
Field of study	Electrical Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
Education level	second-cycle studies	Subject group	
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	3.0
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	dr hab. inż. Paweł Bućko dr inż. Izabela Prażuch	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	15.0	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	6.0	39.0	75

Subject objectives

Understanding the factors influencing the electricity demand. Understanding the basic methods of forecasting the demand in various time horizons. acquiring the ability to apply power forecasts in basic design and planning issues in the power industry.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_U11	The student knows the basic cycles of load variability in the power system and knows their features. Can forecast load variability over different time horizons.	[SU4] Assessment of ability to use methods and tools
K7_W12	The student is able to assess the economic effects of power forecasts. Knows how to create forecasts for the needs of electricity market analysis.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Stochastic nature of the power loads variability. Basic factors influencing the course of the load in time. Division of energy forecasts according to the planning horizon. Basic applications of energy forecasting. Application of a simple extrapolation of past trends in a forecasting application. Econometric models used in forecasting. Methods of forecasting the daily load variability used in KDM. Methods of forecasting weekly and annual load variability used in KDM. Models of seasonal load variability. Component functions of the process. Static and dynamic variability. Forecasting the process of variability of power demand. Applications of multiple regression to forecasting in power engineering. Multiple correlation coefficient (R). Analysis of the influence of independent variables on the regression equation. Applications of neural networks for forecasting. Planning the level of power reserve in the system. Reserve concepts: spinning, hot, cool and cold. Statistical method used to determine electricity production plans by power plants and combined heat and power plants in individual months of the year. Planning of repairs. Classification of repairs of power units. Optimization of renovation periods for blocks. Factors affecting the duration of renovation for a selected block. Problems of forecasting the development of the production system. Taking the demand side into account in programming the development of the power industry. "Integrated System Development Planning". Formulating the problem of forecasting the development of a production system - optimization criterion. Calculation of energy generation costs for past block structures.Prześlij opinięHistoriaZapisaneSpołeczność</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>basic knowledge of energy management and economics.</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>exam</td><td>50.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Gładyś H., Matla R.: Praca elektrowni w systemie elektroenergetycznym, WNT, Warszawa 1999.
2. Dobrzańska I. i inni: Prognozowanie w elektroenergetyce. PCz, Częstochowa 2007.</td></tr>
<tr><td>Supplementary literature</td><td>1. Pr. zbiorowa : Analiza i prognoza obciążeń elektroenergetycznych, WNT, Warszawa 1971.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
PROGNOZOWANIE I PLANOWANIE ROZWOJU W ENERGETYCE [2023/24] - Moodle ID: 32209
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32209</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>forecasting the daily variability of electricity loads,forecasting the annual seasonality</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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