GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Management and control in the power industry, PG_00058361		
Field of study	Hydrogen Technologies and Electromobility		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Przekształtników i Magazynowania Energii -> Department of Power Electronics and Electrical Machines -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Robert Małkowski	
	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	2.0	18.0	50

Subject objectives

Presentation of important issues related to the operation of the electric power system. The role of selected power facilities in voltage and frequency regulation will be discussed. The main factors affecting the development of blackout failures will be presented.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] is aware of the need for continuous education and self-improvement in the field of the profession of an electrician and knows the possibilities of further education	The student is able to indicate the appropriate area of his further education	[SK2] Assessment of progress of work
[K6_U12] can formulate a specification of simple engineering tasks of a practical nature related to the field of study	The student is able to describe the diagnostic process of a selected control system of a selected energy facility	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W16] has knowledge of the current state and the latest development trends related to the field of study.	The student knows the current development trends in the power system.	[SW1] Assessment of factual knowledge

Subject contents

Lecture: Connecting electric power subsystems to parallel running after system breakdown. Frequency controll in a Power Systems. Influence of automatic control of a tap changing step-up transformer on power capability area of generating unit. Voltage stability.

Laboratory: Coupling parameters of simple power grid model elements (generators, transformers, power lines) to conduct research including various load level in modeled power grid. Calculating load flow. Dependencies of voltage changed and/or transformer tap controllers moves on voltage levels and load flow in analyzed grid.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	50.0%	40.0%
Lecture	50.0%	60.0%

Recommended reading	Basic literature	Machowski J., Lubośny Z., Białek J., Bumby J.: Power System Dynamics. Stability and Control. 3rd edition. Hoboken: John Wiley & Sons, 2020. 888 s. ISBN 9781119526346 Małkowski R.: Transformatory z regulacją przekładni pod obciążeniem w systemie elektroenergetycznym. Gdańsk: Politechnika Gdańska, 2019.96 s. ISBN 978-83-7348-778-9 Machowski J., Lubośny Z.: Stabilność systemu elektroenergetycznego. Warszawa: Wydawnictwo Naukowe PWN, 2018.920 s. ISBN 978-83-01-20006-0
	Supplementary literature	Kundur P.: Power System Stability and Control. New York: Mcgraw Hill 1994. ISBN 007035958X.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Describe influence of automatic control of a tap changing step-up transformer on power capability area of generating unit. Describe the basic properties of selected FACTS systems	
Work placement	Not applicable	