GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	High Voltage Engineering, PG_00049616		
Field of study	Electrical Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
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	1	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Olesz	
	Teachers	dr inż. Daniel Kowalak dr hab. inż. Marek Olesz dr inż. Piotr Leśniak	

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	6.0	14.0	50

Subject objectives

Understanding the principles of selection and design of high voltage insulation for use in power system

Learning outcomes

Course outcome	Subject outcome	Method of verification
K7_K02		
K7_U03		
K7_W03		

Subject contents

Types of exposures of insulation systems in operation conditions. Insulating distances in air. Analysis of electric field distributions in the vicinity of HV transmission lines - methods of analysis in field programs of the finite element method. Polluted flashover mechanism and structure of insulators. Designing of supporting and bushing systems. Construction of power cable - types of cables and methods of their laying. Designing power cable lines. Degradation processes and indicators for a state evaluation of insulation systems, forecasting life time of an insulation. Diagnostics and monitoring of high voltage insulation in a power system.

Prerequisites and co-requisites

Credit a subject "High voltage engeneering"

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory exercise	60.0%	40.0%
Written exam	60.0%	60.0%

Recommended reading

Basic literature	1. H. Boryń, M. Olesz, S. Wojtas, Laboratorium TWN II, Skrypt specjalistyczny w wersji elektronicznej, WEiA PG, 2002 2. Mościcka H. (red.): Inżynieria wysokich napięć w elektroenergetyce, Wyd. Pol. Pozn. Tom 1 – 1996, Tom 2 – 1999
Supplementary literature	1. Flisowski Z. Technika wysokich napięć, WNT, Warszawa, 1988 2. Kosztaluk R. I inni: Technika badań wysokonapięciowych, WNT, Warszawa, 1985 3. Wodziński J.: Wysokonapięciowa technika prób i pomiarów, PWN, 1997
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	1. Time -amplitude characteristics of voltage exposure in the power system, 2. Static and impulse electric whistand strength of air gaps 3. Provide limit values for the electric and magnetic field near construction objects located at the HV lines. Methods for limiting the electric field intensity. 4. Discuss the surface contamination sparc mechanism. 5. Give exemplary constructions of support and bushing insulators. 6. Principles of designing support systems 7. Principles of designing bushing systems. 8. Give the constructions of modern HV cables and their accessories. 9. Provide methods and rules for laying power cable lines 10. Provide the rules for designing cable lines. 11. Principles of monitoring the state of HV insulation in the power system 12. Discuss the method of measuring partial discharges 13. Discuss the basic methods of performing voltage tests of insulation systems 14. The lifetime of insulation and its forecasting.
Work placement	Not applicable