GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Power Cables, PG_00021170		
Field of study	Electrical Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2022/2023
Education level	first-cycle studies	Subject group	
Mode of study	Part-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Katedra Elektrotechniki i Inżynierii Wysokich Napięć -> Faculty of Electrical and Control Engineering		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Olesz	
	Teachers	dr inż. Piotr Leśniak dr hab. inż. Marek Olesz	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	10.0	0.0	0.0	20

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	20	8.0	47.0	75

Subject objectives

Students are introduced with the choosing a brand of a power cable, preparing technical assumptions for the design of the cable line, designing cable line and operating.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U09	properly protects cable lines in overload and short-circuit conditions	[SU3] Assessment of ability to use knowledge gained from the subject
K6_K05	identifies operational problems	[SK5] Assessment of ability to solve problems that arise in practice
K6_W09	is able to select the cross-sections of the main and return conductors of power cables	[SW1] Assessment of factual knowledge
K6_U10	can adopt design assumptions and correctly select the type of cable and its cross-section	[SU3] Assessment of ability to use knowledge gained from the subject
K6_U05	is able to safely perform operational measurements	[SU1] Assessment of task fulfilment
K6_K01	knows modern diagnostic methods of testing cable lines	[SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Construction of high voltage cables - Hochstater type and core insulated cables. Insulating and conductive materials used in the cable industry. An influence of a rated voltage and power on cable construction. Extra high voltage power cables, cryogenic and superconducting cables. Cable accessories - terminations and joint boxes. Cable lines - the effect of laying cables for their load - a comparison of overhead and cables lines. design of cable lines. Investigations of cable lines - testing after installation of cables, diagnostic tests during operation and their ability to assess the state of cables.

Prerequisites and co-requisites

basic knowledge of electrical engineering

Assessment methods and criteria

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

Recommended reading	Basic literature	R. Szczerski. Lokalizacja uszkodzeń kabli i wybrane badania eksploatacyjne linii kablowych, WNT Warszawa 1999 Julian Wiatr, Marcin Orzechowski, Radosław Lenertowicz, Podstawy projektowania i budowy elektroenergetycznych linii kablowych SN, Zeszyty dla Elektryków, numer 1, Wydawca: Grupa Medium, 2009
	Supplementary literature	H. Mościcka-Grzesiak: Inżynieria wysokich napięć w elektroenergetyce (HV engineering in power systems), tom I, Wydawnictwo Politechniki Poznańskiej, Poznań 1996
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1. Give examples of modern high voltage cable lines and describe one of them. 2. Specify the method of laying cable lines and describe one of them. 3. Provide the distribution of cable lines due to the earthing of return wire and describe their advantages and disadvantages. 4. Stages of the project selection power cables. 5. Technologies in cable joints and terminations - advantages and disadvantages. 6. Stages of tests MV cable lines. 7. Specify the types of cables and describe one of them 8. Electric field distribution in the cable insulation 9. List and describe ways to protect the cables from water. 10. Describe the advantages and disadvantages of cable lines.	
Work placement	Not applicable	