



Subject card

Subject name and code	Power Cables, PG_00021170						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
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. Jacek Katarzyński 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_W10	is able to select the long-term load capacity for the load power, taking into account the operating arrangement of the cable line			[SW1] Assessment of factual knowledge		
	K6_W11	the student is able to correctly select the operating system of the cable line			[SW1] Assessment of factual knowledge		
	K6_K01	knows modern diagnostic methods of testing cable lines			[SK5] Assessment of ability to solve problems that arise in practice		
	K6_U05	is able to safely perform operational measurements			[SU1] Assessment of task fulfilment		
	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_W09	is able to select the cross-sections of the main and return conductors of power cables			[SW1] Assessment of factual knowledge		
	K6_K05	identifies operational problems			[SK5] Assessment of ability to solve problems that arise in practice		
K6_U09	properly protects cable lines in overload and short-circuit conditions			[SU3] Assessment of ability to use knowledge gained from the subject			
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
	Laboratory passing test	60.0%	40.0%
	Lecture passing test	60.0%	60.0%
Recommended reading	Basic literature	<p>R. Szczerski. Lokalizacja uszkodzeń kabli i wybrane badania eksploatacyjne linii kablowych, WNT Warszawa 1999</p> <p>Julian Wiatr, Marcin Orzechowski, Radosław Lenertowicz, Podstawy projektowania i budowy elektroenergetycznych linii kablowych SN, Zeszyty dla Elektryków, numer 1, Wydawca: Grupa Medium, 2009</p>	
	Supplementary literature	<p>H. Mościcka-Grzesiak: Inżynieria wysokich napięć w elektroenergetyce (HV engineering in power systems), tom I, Wydawnictwo Politechniki Poznańskiej, Poznań 1996</p>	
	eResources addresses	<p>Adresy na platformie eNauczanie: KABLE ENERGETYCZNE [ET][I][Niestacjonarne][2023/24] - Moodle ID: 36116 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36116</p>	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 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		