



Subject card

Subject name and code	High-Voltage Technologies, PG_00038488						
Field of study	Electrical Engineering						
Date of commencement of studies	February 2026		Academic year of realisation of subject			2026/2027	
Education level	second-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery			at the university	
Year of study	2		Language of instruction			Polish	
Semester of study	3		ECTS credits			2.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Marek Olesz				
	Teachers						
Lesson types	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		5.0		15.0	50
Subject objectives	The aim of the course is to educate specialists with knowledge in the field of innovative approaches to the analysis, construction and operation of high - voltage electrical, electromechanical, power and power electronic devices, as well as with the skills to conduct laboratory tests.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K7_U03] is able to obtain information from literature, databases and other sources, also in English, draw conclusions, formulate and fully justify opinions. substantiate opinions; is able to identify directions for further learning and implement the process of self-education		knows technologies that use high-voltage phenomena or are used to create high-voltage technical infrastructure			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject	
	[K7_W05] has detailed knowledge of the regulatory processes in the electricity system electricity system, electricity safety and electricity safety automation, is familiar with technologies high voltage		He/she is familiar with live working technology, work near voltage, and work with the power off, and is able to determine the appropriate procedures for preparing workstations in the mentioned technologies.			[SW2] Assessment of knowledge contained in presentation	

Subject contents	Course content – lecture Lecture:		
	1. Carrying out live work. 2. Methods of locating damage to MV cable lines. 3. Exhaust gas treatment technologies 4. Comparative analysis of the possibilities of transmitting electricity using AC and DC current. 5. Technologies for the production of varistor surge arresters 6. Possible applications of superconducting cables in HV systems. The use of superconductors in high voltage technology. 7. Optimization of the operation of HV devices in testing and measurement technology and their electromagnetic compatibility in the zone of impact of strong electric discharges.		
	Course content – laboratory Laboratory:		
	Measurement and analysis of voltage distribution on insulators at alternating voltage. Measurements of the variability of the electric field generated in the selected working space. Protective characteristics of surge arresters. Cable production or switchboard technology - trip to TFK Bydgoszcz or LAMELn. Żukowo Technologies of live work - training ground in Straszyn		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture	60.0%	50.0%
	Laboratory	60.0%	50.0%

Recommended reading	Basic literature	1. Z. Flisowski: Technika wysokich napięć, WNT Warszawa 2017. 2. Ciok Z.: Procesy łączeniowe w układach elektroenergetycznych, WNT Warszawa 1983. 3. Ciok Z., Maksymiuk J., Pochanke Z., Zdanowicz L.: Badanie urządzeń energoelektrycznych, WNT, Warszawa 1992. 4. Inżynieria wysokich napięć w elektroenergetyce, t.1 i t.2. Praca zbiorowa pod red. Hanny Mościckiej - Grzesiak. Wydawnictwo Politechniki Poznańskiej, Poznań, 1999. 5. J. Maksymiuk, Z Pochanke: Obliczenia i badania diagnostyczne aparatury rozdzielczej, WNT Warszawa 2001. 6. H. D. Stryczewska: Technologie plazmowe w energetyce i inżynierii środowiska, Wydawnictwo Politechniki Lubelskiej, Lublin 2009. 7. A. Wiszniewski: Przekładniki w elektroenergetyce, WNT Warszawa 1992. 8. Kamińska - Benmechernene A.: Wytwarzanie i modelowanie plazmy w plazmotronach łukowych, Wydawnictwo Politechniki Poznańskiej, Poznań, 1998.
	Supplementary literature	1. A. Haddad, D. Warne: Advances in high voltage engineering. Institution of Electrical Engineers 2004. 2. Z. Kołaciński: Thermodynamics of short - arc plasma. PWN Warszawa 1989. 3. Kuffel E., Zaengl W.S., Kuffel J.: High Voltage Fundamentals. Newnes 2005.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Discuss the course of example work under voltage in the power industry on MV lines 2. Characterize any exhaust gas purification technology in industry 3. What are the possibilities of increasing the current capacity of modern power lines? 4. Discuss contemporary development trends in superconductors in the power industry. 5. What is the electromagnetic compatibility of HV devices used in testing and measurement technology? 6. The impact of surge arrester production technology on their current-voltage characteristics. 7. Advantages and disadvantages of direct and alternating current energy distribution	
Practical activities within the subject	Not applicable	

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