

Subject card

Subject name and code	High-Voltage Technologies, PG_00038376								
Field of study	Electrical Engineering								
Date of commencement of studies	October 2023		Academic year of realisation of subject			2023/2024			
Education level	second-cycle studies		Subject group			Optional subject group			
Mode of study	Part-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			Polish			
Semester of study	2		ECTS credits			2.0			
Learning profile	general academic profile		Assessment form			assessment			
Conducting unit	Katedra Elektrotechniki i Inżynierii Wysokich Napięć -> Faculty of Electrical and Control Engineering							ering	
Name and surname	Subject supervisor dr inż. Piotr Leśniak						_		
of lecturer (lecturers)	Teachers		dr inż. Piotr Leśniak						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	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 classes includ plan		Participation in consultation hours		Self-study		SUM	
	Number of study hours	20		5.0	5.0			50	
Subject objectives	The aim of the course is to educate highly qualified specialists with knowledge in the construction and operation of high - voltage devices: electrical, electromechanical, power and power electronics, as well as those havingskills in conducting research on these devices.								
Learning outcomes	Course out	Subject outcome			Method of verification				
	K7_U03		 students can obtain necessary information based on the literature, students can critically evaluate available information, students can formulate conclusions, students can indicate other directions for gaining information and expanding their knowledge. 			[SU2] Assessment of ability to analyse information			
	K7_W11		the student knows the types of devices: electrical, electromechanical, electroity and power electronics, - the student knows the rules for selecting the above. devices within their scope operation, - the student knows technology high voltage and can indicate their possibilities use.			[SW2] Assessment of knowledge contained in presentation			
Subject contents	Lecture:1. Comprehensive monitoring of the operation of the HV power line. Carrying out live work.2. Methods of locating damage to MV cable lines. Lightning arresters and surge arresters.3. Plasma technologies. Modern methods of ozone production.4. The use of superconductors in high voltage technology.5. Comparative analysis of the possibilities of transmitting electricity using AC and DC current.6. The impact of increasing the load capacity of a long-term HV power line on its operational parameters. GIS and enclosed switchboards with air insulation.Lab:1. Measurement and analysis of voltage distribution on insulators at alternating voltage.2. Study of the influence of temperature variability on the conduction characteristics of the semiconductor structure of the varistor.3. Measurements of the variability of the magnetic field generated in the selected working space.4. Investigation of the phenomenon of electrical discharge and the course of partial discharges in induction transformers.								
Prerequisites and co-requisites			-						
Data wardrukur 20.05.2024									

Intercicial exercise Dot 00 Dot 00 Practical exercise 00.0% 40.0% Recommended reading Basic literature 1. Z. Filesowski: Technika wysokich naplęć, WNT Warszawa 2017. 2. Ciok Z.: Procesy lączeniowe w układach elektroenergetycznych, WNT Warszawa 1983. 3. Ciok Z.: Maksymiuk J., Pochanke Z., Zdanowicz L: Badanie uradzóra fenezjoektrycznych, WNT, Warszawa 1982. 4. Inżynieria wysokich napięć w elektroenergetyce; 1.1 1:2. Praca zbiorowa pod red. Hamy Modochiej - Grzesiak. Wydawnictwo Politechniki Poznańskiej, Poznań, 1999. 5. J. Maksymiuk J. Pochanke: Obliczenia i badania diagnostyczne aparatury rozdzielczej, WNT Warszawa 2001. 6. H. D. Stryczewska: Technologie plazmowe w energetyce i inżynierii środowiska, Wydawnictwo Politechniki Lubelskiej, Lubii 2009 7. A. Wiszniewski: Przekładniki w elektroenergetyce, WNT Warszawa 1992. 8. Karnińska - Benmechernene A: Wytwarzanie i modelowanie plazmy w plazmotonach łukowych, Wydawnictwo Politechniki Poznańskiej, Poznań, 1999. 9. Supplementary literature 1. A. Haddad, D. Warne: Advances in high voltage engineering. Institution of Electrical Engineers 2004. 2. Z. Kolaciński: Thermodynamics of short - arc plasma. PWN Warszawa 1993. 3. Kuffel E. Zaengl W.S., Kuffel J.: High Voltage Fundamentals. Newnes 2005. eResources addresses Atorsy na platformie enauczanie: Technologie plazmote (Nextorsy naplatformie enauczanie) interopored not mew. 2005. example q	Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
Recommended reading Basic literature 1. Z. Filsowski: Technika wysokich napięć, WNT Warszawa 2017. 2. Cink Z.: Procesy lączeniowe w układach elektroenergetycznych, WNT Warszawa 1983. 3. Cink Z.: Procesy lączeniowe w układach elektroenergetycznych, WNT Warszawa 1983. 3. Cink Z.: Maksymiuk J., Pochanke Z., Zdanowicz L: Badanie urządzeń energoelektrycznych, WNT, Warszawa 1982. 4. Inżynieria wysokich napięć w elektroenergetyce, 11 i 12. Fraca zbiorowa pod red. Hamy Medocikej. Grzesiak. Wydawnictwo Politechniki Poznańskiej, Poznań, 1999. 5. J. Maksymiuk, Z. Pochanke Z., Zdanowicz L: Badanie urządzeń energoelektrycznych, WNT Warszawa 1992. 5. J. Maksymiuk, Z. Pochanke Z., Zdanowicz L: Badanie urządzeń energoelektrycznych, WNT Warszawa 2001. 6. H. D. Stryczewska: Technologie plaznowe w energetyce i inzynierii środowiska, Wydawnictwo Politechniki Poznańskiej, Poznań, 1999. 6. J. Maksymiuk, Z. Pochanke: Obliczenia i badania diagnostyczne aparatury rozdzielczej, WNT Warszawa 2001. 8. H. D. Stryczewska: Technologie plaznowe w energetyce i inzynierii środowiska, Wydawnictwo Politechniki Poznańskiej, Poznań, 1998. 8. Kamiska - Benmechernene A: Wytwarzanie i modelowanie plazmy w plazmotonach łukowych, Wydawnictwo Politechniki Poznańskiej, Poznań, 1988. Supplementary literature 1. A. Haddad, D. Warre: Advances in high voltage engineering. Institution of Elactrical Engineers 2004. Z. Kołaciński: Thermodynamics of short - arc plasma. PWN Warszawa 1999. 3. Kuffel E., Zaengl W.S., Kuffel J.: High Voltage Fundamentals. Newmes 2005. eResources addresses Artesy	and criteria	Written exam	50.0%	60.0%			
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WNT Warszawa 1983. 3. Ciok Z., Maksymiuk J., Pochanke Z., Zdanowicz L.: Badanie urządzeń energoelektrycznych, WNT, Warszawa 1992. 4. Inżynieria wysokich napięć w elektroenergetyce, I.1 i 1.2. Praca zbiorowa pod red. Hanny Mośsickiej – 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 niżynierii środowiska, Wydawnictwo Politechniki Lubelskiej, Lubin 2009 7. A. Wiszniewski: Przekładniki w elektroenergetyce, WNT Warszawa 1992. 8. Kamifeda - Bennachemene A.: Wytwarzanie i modelowanie plazmy w plaznofronach lukowych, 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.; Zaengi W.S., Kuffel J.: High Voltage Fundamentals. Newnes 2005. eResources addresses Arresy na plaformie eNauczanie: Tachnologie Wysokonapięciowe [Niestacjonarne 2023/24] - Moodle 1bgs/Jenauczanie.pg. edu. pl/moodle/course/view.php?id=36133 Example issues/ watap lasma technologies are and what their applications are 4. What tech in superconductors in the power industy 6. What is the electromagnetic compatibility of HV devices used in testing and measurement technologies?	Recommended reading	Basic literature	1. Z. Flisowski: Technika wysokich napięć, WNT Warszawa 2017.				
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	Work placement	Not applicable					