	OLOGY						Faculty of Electrical En	iginieering		
Field of study	Electrical	al Engineeri	ng				Level and form of study	Bachelor's degre	е	
A group of modules specialty							Education profile			
Course name	Designin	ng of electric	cal net	works		E	Course code	IS-FEE-10077W		
					5 \4/		Course type	Elective		
Course form(s) and number of hours	30	C LC 15	P 15	SW	FW	S	Semester ECTS credits	Winter		
The programme is valid from							2025/2026			
ntroductory courses										
Course objectives	To introduce students to complex systems and advanced construction solutions for power systems and the matching of equipment used in these systems especially destroyed during military operations. To explain to students the principles decentralized energy generation destroyed during military operations. To introduce students with the experience and challenges of reconstruction of the power network infrastructure destroyed during military operations. To train students the design of complex power systems and the requirements of standards and regulations that newly designed transmission lines should satisfy. To design a part of a power system. Training in the ability to take measurements and analyze parameters characterizing specific operating states of electrical power systems (both during normal and fault conditions).									
Framework programme content	(NPS) in lines (dis Symmetr overheac Operation generatic Project: Calculati wire hand wire conf Laborato Measurel detection	normal constribution arrical and as d lines. Wirn of power on of the point of the p	nditions and transport of the transport of transport of the transport of transport	s and os smissistrical ses, streen fault ystem es of wwire hoters. A	destroy on). Poshort ci ess patt conditi destroy wires. Claanging assemb	red dower reuits erns ons yed do Calcu met oly bo	s, their relationships and or luring military operations. I and energy losses in powers in power systems. Influer , stress types and state eq especially destroyed durin during military operation. allation of wire sag for specification. Specifications and charts. characterizing specific oper r losses. Study and analys	Design solutions for systems and en noe of atmospheric quation. Wire hang g military operation cific conditions. Idea ation of insulators.	or overhead and lergy transmission conditions on the conditions on the conditions on the conditions. Decentralization of mile. Specification of mover systems. Converses the conditions of the c	cable power on efficiency. the operation of nitations. ation of electricity nimum height for f pole shape and
	anarysis	or power q				cour	se refers to the principles	of sustainable dev	elopment	
Other information about the course							ed to the scientific activity			
Calculation:	Student	workload	relate	d to:				Total number of hours	including contact	including practical
		tion in lectu		_				30	30	
		tion in othe			uviues			30 5	30 5	30
		tion in cons						5	5	3
	completion	on of profe	ssiona	l traini	ng			0	0	0
		ion for pass	_			amir	nation	10		
	preparati	ion for prac	tical cl	asses				45		45
										0
								_		0
										0
										0
										0
						otal	Total number of hours:		70	0 0 78
					T	otal	Total number of hours: number of ECTS credits:		70 2,8	0 0 78 3,1
Expected discipline learning outcome	nes				T	otal				0 0 78 3,1 Social
Expected discipline learning outcome	ies				T	otal		: 5	2,8	0 0 78 3,1 Social
Dbjectives and framework content		nż. Zbigniev	w Skibi	ko, prc				: 5	2,8	0 0 78 3,1
Dbjectives and framework content prepared by	dr hab. in	nż. Zbigniev	w Skibi	ko, pro			number of ECTS credits:	Knowledge	2,8	0 0 78 3,1 Social competence
Dbjectives and framework content prepared by	dr hab. in	nż. Zbigniev	w Skibi	ko, pro			number of ECTS credits:	Knowledge	2,8	0 0 78 3,1 Social competence
Dbjectives and framework content prepared by	dr hab. in	/pes, functio	ons, co	onditio	of. PB;	dr inz	number of ECTS credits: ż. Zbigniew Sołjan 2025	Knowledge Date:	2,8 Skills	0 0 78 3,1 Social competence
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Dbjectives and framework content prepared by	dr hab. ir	/pes, function	ons, co ations i	ondition n Ukra ntralize	n and eaine	dr inz	Zbigniew Soljan 2025 Lecture cted development and reco	Knowledge Date: Date: Onstruction of powing military operations	2,8 Skills er systems dest	0 0 78 3,1 Social competence 24.03.20
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	1 Calculation of cable tension strengths	
	 2 Calculation of cable overhangs for specific conditions 3 Specification of the minimum installation height for wires 	
	4 Option for installing the wires - regulations	
	5 Matching types of insulators	
	6 Specification of the pole profile and the parameters for the wi	ires
	7 Assembly instructions and charts	
	Laboratory class	ses
	Study and analysis of the power quality parameters	
	2 Identifying faults in cable lines	
	3 Study of current and voltage asymmetry in power systems	
	4 Study of ground faults in medium-voltage networks	
	5 Study of voltage drops and power losses in power systems	
	6 Reactive power compensation	
	L lecture with multimedia presentation	
Teaching methods site classes)	(on P practical project	
	LC experiments	
	L lecture with multimedia presentation	
Teaching methods	L lecture with multimedia presentation	
(online classes)	-	
(online classes)	<u>-</u>	
	L written exam: test	
	P project realization and project defense	
Forms of crediting	LC completion of exercise, reports	
	-	
	L more than 51% of the possible points	
Conditions of anadistrees	P correct project design and correct answers to the questions a	ısked
Conditions of crediting	LC correct completion of exercises and reports of completed exe	
	-	
		Expected learning outcomes defined for the
Outcome symbols	Expected learning outcomes	field of study
•	·	
		Knowlegde Skills Social competence
	Knowledge: the student knows and understands	
	construction and principles of operation of advanced and complex	
E1	power systems	
	advanced and modern technical solutions for the construction of	
E2	distribution and transmission power systems	
E3	fundamental phenomena in distribution and transmission systems	
	Skills: the student can	
E4	apply the principles of matching electrical equipment in distribution	
L 4	and transmission systems	<u></u>
E5	design advanced electrical power systems using standards and	
	catalogues to correctly match the equipment	<u> </u>
E6	prepare project documentation for a part of the power distribution ar	nd
	transmission system	_
	perform measurement analyses of parameters characterizing the	
E7	operation of the power system, interpret the results and formulate	
	conclusions	
	Social competence: the student is ready to	
E8	work in a team and prepare and implement a work schedule to	
	achieve the required goal	
		_
		_
Outcome symbols	Methods of verification of learning outcomes	Course form subject to verification
E1	Test exam	L
E2	Test exam	 L
E3	Test exam	L
E4	Project realization	P
E5	Project realization	P
<u>=6</u>	Project realization	P
=0 =7	Laboratory report realization	LC
E8	Class work	LC
LV	1 Schavemaker P., Sluis L., Electrical Power System Essential	
	2 Grainger J., Power System Analysis (Si), McGraw-Hill Educa	
Basic references	3 Dugan R.C., et all, Electrical Power Systems Quality, Thrid Electrical Power Systems Quality	
	4 Kiessling F., et all, Overhead Power Lines: Planning, Design,	
	5 Collective study, Electric Power and Energy Distribution Syste	
	1 Wang X.F., et all, Modern Power Systems Analysis, Springer	
Supplementary references	2 Krischen D.S., Fundamental Concepts and the Transition to S	
	3 Collective study, Power quality in Moder Power Systems, Els	
Course coordinator	dr hab. inż. Zbigniew Skibko, prof. PB; dr inż. Zbigniew Sołjan	Date: 24.03.20
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