

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject High voltage engineering		Code 1010321251010311585
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 5
Elective path/specialty -	Subject offered in: polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: - Laboratory: - Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 3 100%
Responsible for subject / lecturer: dr hab. inż. Krzysztof Siodła, prof. PP email: krzysztof.siodla@put.poznan.pl tel. 61-665 2272 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has the knowledge in the scope of electrical engineering material science, theoretical electrotechnic and physics.
2	Skills	Student has the ability to effective self-education in the scope of chosen field of study
3	Social competencies	Student is awared of expanding his knowledge, ability, competences, can work and cooperate in group.
Assumptions and objectives of the course: Learning of basic problems dealing with high voltage engineering. Knowledge of parameters describing insulating systems used in high voltage engineering. Knowledge of breakdown mechanisms in various insulating materials.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has knowledge in the scope of high voltage insulation of electric power equipment - [K_W08++]		
2. Student has knowledge in the scope of transformer and electrical machines insulation - [K_W13++]		
3. Student has knowledge in the scope of phenomena in high voltage insulating systems - [K_W26++]		
Skills:		
1. Student has the ability of measurement procedures of basic parameters in high voltage engineering - [K-U02+++]		
2. Student has the ability of comparing various construction of equipment working in power system under high voltage. - [K_U12++]		
3. Student has the ability to formulate basic guidelines dealing with exploitation of high voltage insulating systems. - [K_U23++]		
Social competencies:		
1. Student is awared of influence of phenomena in high voltage systems on environment. - [K_K02++]		
2. Student is awared of financial costs connected with negative influence of physical phenomena proceeding in high voltage engineering. - [K_K04++]		
3. Student is awared of dilemma connected with costs of limitation the negative influence of high voltage equipment on environment. - [K_K06++]		
Assessment methods of study outcomes		

Lecture ? evaluation of knowledge and skills proved with exam.		
Course description		
Utilisation of high voltage engineering in physical engineering, industrial processes, environment protection and electrical power engineering. Physical basis of breakdown phenomena in solid, liquid, gas and vacuum insulation. Atmospheric lightning. Evaluation of electrical parameters of insulating materials ? resistivity, permittivity, loss factor, breakdown voltage. Influence of electric and magnetic field on the environment and human being. Insulation co-ordination. Electric field distribution in high voltage equipment.		
Basic bibliography:		
<ol style="list-style-type: none"> 1. Flisowski Z., Technika wysokich napięć, WNT, Warszawa, 2008. 2. Kosztaluk R. i inni, Technika badań wysokonapięciowych, tom 1 i 2, WNT, Warszawa, 1985. 3. Florkowska B., Wytrzymałość elektryczna gazowych układów izolacyjnych wysokiego napięcia, Uczelniane Wydawnictwo Naukowo?Dydaktyczne AGH, Kraków, 2003. 4. Florkowska B., Technika wysokich napięć, Wydawnictwo AGH, Kraków, 1988. 5. Gacek Z., Technika wysokich napięć, Wydawnictwo Politechniki Śląskiej, Gliwice, 1999. 6. Inżynieria wysokich napięć w elektroenergetyce, pod red. H.Mościckiej-Grzesiak, Wydawnictwo Politechniki Poznańskiej, tom 1 1996, tom 2 1999. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Florkowska B. i inni, Mechanizmy, pomiary i analiza wylądowań niezupełnych w diagnostyce układów izolacyjnych wysokiego napięcia, Uczelniane Wydawnictwo Naukowo ? Dydaktyczne AGH, Kraków, 2001. 2. Gacek Z., Kształtowanie wysokonapięciowych układów izolacyjnych stosowanych w elektroenergetyce, Wydawnictwo Politechniki Śląskiej, Gliwice, 2002. 3. Gacek Z., Wysokonapięciowa technika izolacyjna, Wydawnictwo Politechniki Śląskiej, Gliwice, 2006. 4. Szpor S., Ochrona odgromowa, WNT Warszawa, 1983 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in exam	1	
3. Preparation for exam	10	
4. Consultation	5	
Student's workload		
Source of workload	hours	ECTS
Total workload	31	3
Contact hours	21	1
Practical activities	0	0