

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Exploitation of electric power equipment		Code 1010314391010316895
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 5 / 9
Elective path/specialty High Voltage Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 18 Classes: - Laboratory: - Project/seminars: 18		No. of credits 4
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 Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr hab. inż. Hubert Morańda email: hubert.moranda@put.poznan.pl tel. 61 665 2035 Faculty of Electrical Engineering ul. Piotrowo 3A, 61-138 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has the knowledge in construction of electric power equipment, as well as transmission and distribution network.
2	Skills	Student has the ability to effective self-learning in the scope of chosen field of study.
3	Social competencies	Student is aware of expanding his knowledge, ability, competences, can work and cooperate in group.
Assumptions and objectives of the course: Knowledge of exploitation activity and procedures of equipment working in generation, transmission and distribution of electric power (transformers, cables, capacitors, insulators, switching devices, GIS/GIL)		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has extended knowledge in the scope of electric power equipment exploitation - [K_W08+++] 2. Student has systematic and theoretical knowledge in the scope of power grid exploitation - [K_W13+++]		
Skills:		
1. Student is able to prepare the documentation of electric power equipment exploitation - [K_U07+++] 2. Student is able to exploit properly the power equipment according to general demands and technical documentation - [K_U23+++]		
Social competencies:		
1. Student is conscious of importance and results of electrical engineer activity, including the influence on environment as well as proper exploitation of power equipment - [K_K02+++]		
Assessment methods of study outcomes		
Lecture: evaluation of knowledge and skills proved with exam Project classes: evaluation of individually prepared instruction of chosen equipment exploitation, or power grid sector		
Course description		

The principles of electric equipment and installation exploitation of low, medium and high voltage. Technical-exploitation documentation, taking equipment for work. Exploitation of power generators, transformers, substations, overhead and cable lines, power factor correction capacitors, electric machines, lighting equipment, rectifiers, batteries, diesel generators. Electric shock protection rules. Principles of rational and safe operation of power equipment and installations.

Update 2017:

- water in power transformers insulation and the risks associated with it.

Basic bibliography:

1. Flisowski Z., Technika wysokich napięć, WNT, Warszawa, 2015
2. Lenartowicz R., Zdunek W., Egzamin kwalifikacyjny. Urządzenia instalacje i sieci elektroenergetyczne, Medium Warszawa, 2010
3. Strojny J., Strzałka J., Elektroenergetyka. Obsługa i eksploatacja urządzeń, instalacji i sieci, Europex Kraków, 2003
4. Inżynieria wysokich napięć w elektroenergetyce, pod red. H. Mościckiej-Grzesiak, Wydawnictwo Politechniki Poznańskiej, tom 1 1996, tom 2, 1999
5. Gacek Z., Technika wysokich napięć, Wydawnictwo Politechniki Śląskiej, Gliwice, 1999

Additional bibliography:

1. Gielniak J., Morańda H., Dynamika zawilgocenia izolacji transformatorów energetycznych w zależności od konstrukcji, Przegląd Elektrotechniczny, 2014, Tom 90, Wyd. 10, ss. 27-30.
2. Gacek Z., Wysokonapięciowa technika izolacyjna, Wydawnictwo Politechniki Śląskiej, Gliwice, 2006
3. Gacek Z., Kształtowanie wysokonapięciowych układów izolacyjnych stosowanych w elektroenergetyce, Wydawnictwo Politechniki Śląskiej, Gliwice, 2002

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	18
2. Participation in project classes	18
3. Participation in exam	5
4. Preparation for exam	18
5. Consultations	18
6. Preparation of project	18
7. Preparation for project classes	18

Student's workload

Source of workload	hours	ECTS
Total workload	113	4
Contact hours	86	3
Practical activities	54	2