

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Design of electric network and electric power protection system		Code 1010315341010316101
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty Networks and Electric Power Systems	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: - Classes: - Laboratory: - Project/seminars: 18		No. of credits 2
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 %) 2 100% 2 100%
Responsible for subject / lecturer: mgr inż. Bartosz Olejnik email: bartosz.olejnik@put.poznan.pl tel. +48 61 665 2270 Elektryczny ul. Piotrowo 3a 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has knowledge of the basics of electrical engineering, power engineering and Protection Devices.
2	Skills	Student can calculate maximum power demand, short-circuit currents, knows the principles of configuration protection settings.
3	Social competencies	Student is aware group work.
Assumptions and objectives of the course: Acquire the skills to create a project of a small segment of the grid.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has an extended knowledge of the structure and principles of operation the power system - [K_W16 ++] 2. Student has knowledge of the capabilities and limitations of the methods used in the computer assisted design in electrical engineering - [K_W18 ++]		
Skills:		
1. Students can use the known methods and mathematical models - if necessary, modifying them - for the analysis and design of components, equipment and electrical systems - [K_U06 ++] 2. Student can design components, equipment and electrical systems, including the selected economic or performance and, if necessary, adapt existing or develop new methods of design and computer-aided design tools - [K_U12 ++]		
Social competencies:		
1. The student understands the need for the formulation and inform the public-eg through the mass media-the information and opinions on the developments in the field of electrical engineering; takes pains to give such information and opinions in a widely understood, presenting different points of view - [K_K02 ++]		
Assessment methods of study outcomes		

<ul style="list-style-type: none"> - determine the ability to work in a team performing specific tasks in practice, - rewarding the knowledge necessary to carry out the questions posed in the task area (source texts), - assessment of knowledge and skills related to the implementation of the practice task, - assessment of report of the project. 		
Course description		
<p>Determining the model of an existing fragment of the power system. Determination of the predicted power required of a selected group of recipients. Determination of normal and short-circuit operating conditions states of designed system. Selection of overhead wires or cables. Selection of fuses for LV networks. Selection of transformers and relays for MV and HV networks. Assessment of the impact of the proposed MV line on the earth fault protection installed in other line fields the station.</p>		
Basic bibliography:		
<ol style="list-style-type: none"> 1. Kacejko P., Machowski J. : Zwarcia w sieciach elektroenergetycznych. Podstawy obliczeń. WNT Warszawa, 1993 2. Żydanowicz J. : Elektroenergetyczna automatyka zabezpieczeniowa. Tom I : Podstawy zabezpieczeń elektroenergetycznych. WNT Warszawa, 1979 3. Żydanowicz J. : Elektroenergetyczna automatyka zabezpieczeniowa. Tom II : Automatyka eliminacyjna. WNT Warszawa, 1985 4. Wiatr J., Orzechowski M.: Poradnik projektanta elektryka. Dom Wydawniczy Medium, 2012 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Norma N SEP-E-002 2. Strona internetowa: http://www.studium.zue.pwr.wroc.pl/download/studium/Moce%20szczytowe.pdf 3. Kujaszczyk Sz. (red.) Elektroenergetyczne sieci rozdzielcze. Tom II, PWN Warszawa, 1994. 4. Winkler W., Wiszniewski A. : Automatyka zabezpieczeniowa w systemach elektroenergetycznych. WNT Warszawa, 1999 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in project classes	18	
2. Participation in consultation	5	
3. Implementation of the project	30	
Student's workload		
Source of workload	hours	ECTS
Total workload	53	2
Contact hours	23	1
Practical activities	53	2