

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Electrical distribution networks		Code 1010314391010315998
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 5 / 9
Elective path/specialty Distribution Devices and Electrical	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: 9 Classes: - Laboratory: 9 Project/seminars: 9		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		ECTS distribution (number and %)
Responsible for subject / lecturer: dr hab. inż. Ryszard Batura email: ryszard.batura@put.poznan.pl tel. 061 665 2767 Wydział Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Fundamentals of the electrical devices and measuring equipment and its application. Knowledge. Knowledge of the single- and three-phase AC systems and the electric power distribution system's structure.
2	Skills	Ability to acquire information from the literature in the field and other sources and to analyze it in evaluative way. Ability to deal with the analytical, simulation and experimental tools. 1c. Has understanding of the aspects and effects of the engineer's responsibility for made decisions. Is able to work in the team.
3	Social competencies	Has basic knowledge of the construction solutions, parameters and choice criterions of electric power switches, MV switchgears, bus bars and bus ducts. Is able to construct the test networks and to carry out the electric power devices tests.
Assumptions and objectives of the course: Getting familiar with the MV and LV electric power supply and distribution systems. Acquired knowledge of construction, methods and computer-aided design of the distribution network elements as well as that of the legal requirements in force related to the accomplishment of the latter.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Has knowledge about design, construction and operation principles of the electric power devices. - [K_W08 ++] 2. Has knowledge of the electric power system fundamentals including structure and operating conditions of the generation, transmission and distribution electric power sectors; knows basic principles of the electric power system elements' operation and maintenance. - [K_W24 ++]		
Skills: 1. To compare different design solutions related to the basic questions in the electrical engineering domain regarding chosen application and economic criterions. - [K_U12 +] 2. To use the properly chosen programistic environments, simulators and IT tools aiding the design to carry out simulation, design and analysis of the simple electric circuits - [K_U13 +]		
Social competencies: 1. Has understanding of the need and knows opportunities of the lifelong learning (second and third cycle studies, post-graduate courses) as well as the need for upgrading the professional, personal and social competencies. - [K_K01 +]		
Assessment methods of study outcomes		

<p>Lecture: ?Assessment of the knowledge and skills during the problem-type written examination, ?Continuous assessment, at each class (bonus for activity and perception quality).</p> <p>Laboratory: ?Test and bonus for a knowledge necessary to accomplish the problems posed in the lab task area, ?Assessment of the knowledge and skills related to the class task accomplishment, assessment of the lab report.</p> <p>Projects: ?Test and bonus for a knowledge necessary to accomplish the design task, ?Assessment of the knowledge and skills related to the design task accomplishment.</p> <p>Adding extra points for activity in discussions, especially for: ?effectiveness of implementation of the knowledge acquired when solving a given problem. ?ability to cooperate in the team accomplishing in practice a specific task in lab. ?remarks related to the educational materials? enhancement, ?care and esthetic form of the elaborated lab reports and designs ? within the individual work.</p>		
Course description		
<p>Electric power supply and distribution systems in the MV and LV electric power distribution network. Requirements of the power supply certainty and reliability and power supply systems. . Distribution networks? components, structure solutions and the construction and design principles. Power flow and energy losses description. Choice of the overhead and cable line conductors and electrical apparatus. Legal regulations and conditions related to the overhead and cable line completion.</p> <p>Laboratory subjects are related to those presented during lectures.</p>		
Basic bibliography:		
<p>1. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2001 2. Prawo Energetyczne, Prawo Budowlane. 3. Przepisy eksploatacji urządzeń elektroenergetycznych, WEMA Warszawa, 1996.</p>		
Additional bibliography:		
<p>1. Magazins Elektroinstalator, Elektroinfo. 2. Related standards. 3. Manufacturers? data sheets. 4. Internet publications</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Lectures	9	
2. Laboratory	9	
3. Projects	9	
4. Part in consultations	30	
5. The preparation to occupations, the study of laboratory documentation	30	
Student's workload		
Source of workload	hours	ECTS
Total workload	87	3
Contact hours	57	2
Practical activities	39	1