

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Nowoczesne aparaty elektryczne 2**  
 Name in English: **Modern electrical devices 2**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable): **Electrical Power Engineering**  
 Level and form of studies: **2nd level, full-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR052418**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):			15		
Number of hours of total student workload (CNPS):			30		
Form of crediting:			crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:			1		
including number of ECTS points for practical (P) classes :			1		
including number of ECTS points for direct teacher-student contact (BK) classes:			0.70		

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. The student should have knowledge of the construction, operation and phenomena occurring in electrical devices.
2. He knows the rules for the selection and design of protection for low and high voltage electrical installations as well as electric motors and drives.

**SUBJECT OBJECTIVES**

- C1. The student is able to program, protect and use modern electrical devices  
 C2. The student can remotely control modern electrical devices.

**SUBJECT LEARNING OUTCOMES***relating to knowledge:**relating to skills:*

PEU\_U01 Is able to operate and connect circuits with modern constructions of electrical devices

PEU\_U02 Is able to apply protection based on a modern electric devices

*relating to social competences:*

PEU\_K01 He understands the need to solve tasks and work in a group.

**PROGRAMME CONTENT**

Form of classes - laboratory		Number of hours:
Lab 1	Introduction - defining the rules in the laboratory and the criterion of passing	1
Lab 2	Remote control of modern electrical devices, modular devices (data registration and analysis)	4
Lab 3	Engine starting and protection via PSTX Softstarter	2
Lab 4	Protection, control of electric drives made on the ABC 100.3 UMC system.	2
Lab 5	Stand for testing of automatic switching in low voltage switchgear with the use of the ABB controller.	2
Lab 6	Examination of the protections in the low voltage switchgear.	2
Lab 7	Summary classes	2
Total hours:		<b>15</b>

**TEACHING TOOLS USED**

N1. laboratory stand

**EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT**

<b>Evaluation</b> <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	<b>Educational effect number</b>	<b>Way of evaluating educational effect achievement</b>
F1(L)	PEU_U01 PEU_U02 PEU_K01	Checking and assessment of preparation for laboratory exercises.
F2(L)	PEU_U01 PEU_U02 PEU_K01	Activity during laboratory classes.
F3(L)	PEU_U01 PEU_U02 PEU_K01	Evaluation of test reports.
P(L)	$P=0,4 \cdot F1 + 0,4 \cdot F2 + 0,2 \cdot F3$	

**PRIMARY AND SECONDARY LITERATURE****PRIMARY LITERATURE:**

Exercise instructions

**SECONDARY LITERATURE:****SUBJECT SUPERVISOR**

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