

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Systemy ochrony przed zagrożeniami prądem elektrycznym 2**  
 Name in English: **Systems of protection against electric shock 2**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable):  
 Level and form of studies: **1st level, part-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR052465**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):			20		
Number of hours of total student workload (CNPS):			60		
Form of crediting:			crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:			2		
including number of ECTS points for practical (P) classes :			2		
including number of ECTS points for direct teacher-student contact (BK) classes:			1.40		

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

1. Knowledge of the basic principles of electrical engineering
2. Basic knowledge of the construction and operation of the electrical equipment and apparatus
3. Basic ability to connect the measurement circuits
4. Basic ability to use the electrical quantities meters
5. Ability to cooperate in a team
6. Ability to think and act creatively

**SUBJECT OBJECTIVES**

- C1. Knowledge of operation rules of electric shock protection systems used in low-voltage installations  
 C2. Knowledge of effectiveness criteria of electric shock protection systems in low-voltage installations  
 C3. Knowledge of principles of low-voltage electrical installations testing

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

- PEU\_U01 Student is able to perform the verification measurements in low-voltage electrical installations  
 PEU\_U02 Student is able to evaluate the results of measurements  
 PEU\_U03 Student can make a report for verification

*relating to social competences:*

- PEU\_K01 Student can effectively cooperate in a team performing electrical verification tests

## PROGRAMME CONTENT

Form of classes - laboratory		Number of hours:
Lab 1	Presentation of safety rules and guidelines in the laboratory. Establish the requirements for crediting. General introduction to the stand of laboratory.	2
Lab 2	Resuscitating of persons shocked by electric current	2
Lab 3	Measurement of insulation resistance and electric strength test of electrical installation and electrical equipment	2
Lab 4	Examination of protection by automatic disconnection of supply with overcurrent devices	2
Lab 5	Examination of protection by automatic disconnection of supply with residual current devices. Measurement of the resistance and the continuity of protective conductors and protective equipotential bonding conductors.	2
Lab 6	Measurement of earth electrode resistance and the resistivity of soil	2
Lab 7	Measurement of insulation resistance of floors and walls. Measurement of touch voltage	2
Lab 8	Examination of the impact of TN and TT systems parameters on the electric shock hazard	2
Lab 9	Measurements of electric shock hazard and fire hazard in IT system.	2
Lab 10	Additional term Laboratory crediting	2
Total hours:		<b>20</b>

## TEACHING TOOLS USED

- N1. Introductory, short informative lecture  
 N2. Basic meters of electrical quantities  
 N3. Special meters for electrical installations

## EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(L)	PEU_U01 PEU_U02 PEU_K01	activity in the laboratory
F2(L)	PEU_U02 PEU_U03	report
P(L)	$P = 0,25F1 + 0,75F2$	

## PRIMARY AND SECONDARY LITERATURE

### PRIMARY LITERATURE:

- [1] Instrukcje do ćwiczeń laboratoryjnych  
 [2] Markiewicz H.: Bezpieczeństwo w elektroenergetyce: zagadnienia wybrane. WNT, Warszawa 2009

### SECONDARY LITERATURE:

- [1] PN-IEC 60364 Instalacje elektryczne w obiektach budowlanych (norma wieloarkuszowa)  
 [2] PN-HD 60364 Instalacje elektryczne niskiego napięcia (norma wieloarkuszowa)  
 [3] Ustawa „Prawo budowlane” wraz z rozporządzeniami wykonawczymi

## SUBJECT SUPERVISOR

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