

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Miernictwo wysokonapięciowe i diagnostyka izolacji**  
 Name in English: **High Voltage Measurement and diagnostics of insulation**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable): **Industrial Electrical Engineering**  
 Level and form of studies: **2nd level, full-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR041104**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):			30		
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. Basic knowledge In the range of high-voltage technique and electrical metrology.

**SUBJECT OBJECTIVES**

- C1. Gaining theoretical knowledge and skills in the range of high-voltage metrology.  
 C2. Gaining theoretical knowledge in the range of selected diagnostic test methods of materials and high voltage insulation systems.

**SUBJECT EDUCATIONAL EFFECTS***relating to knowledge:**relating to skills:*

PEK\_U01 The Student is prepared to high-voltage measurement.

PEK\_U02 The Student is prepared to diagnostic measurements of high voltage equipment and to work on positions related to the operation of such devices.

*relating to social competences:*

PEK\_K01 The Student will gain knowledge about any risks to personnel and equipment

**PROGRAMME CONTENT**

Form of classes - laboratory		Number of hours:
Lab 1	Introduction, regulations, occupational health and safety regulations, requirements, scope lab	3
Lab 2	Direct measurement methods of high voltage - sphere spark gap, electrostatic voltmeter	3
Lab 3	Indirect measurement methods of high voltage - measurements of peak voltage value	3
Lab 4	Determination of scale factors of high voltage measurement systems	3
Lab 5	Tests of high surge voltage protection devices	3
Lab 6	Tests of composite insulator under high AC voltage	3
Lab 7	Tests of composite insulator under high surge voltage	3
Lab 8	Measurements of partial discharges	3
Lab 9	Examination of surface properties of insulating materials	3
Lab 10	Correction term, credit lab	3
Total hours:		<b>30</b>

### TEACHING TOOLS USED

- N1. Individual learning  
N2. Laboratory measurements, analysis of results, preparation of reports

### EVALUATION OF SUBJECT EDUCATIONAL EFFECTS 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)	PEK_U01 PEK_U02 PEK_K01	Preparation for laboratory classes
F2(L)	PEK_U01 PEK_U02 PEK_K01	Preparation of the report
P(L)	$P=0,7 \cdot F1 + 0,3 \cdot F2$	

### PRIMARY AND SECONDARY LITERATURE

#### **PRIMARY LITERATURE:**

E.Kuffel, W.S. Zaengel, J. Kuffel: High Voltage Engineering Fundaments, Elsevier, 2000

#### **SECONDARY LITERATURE:**

### SUBJECT SUPERVISOR

Krzysztof Wieczorek, krzysztof.wieczorek@pwr.edu.pl

### MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT **ELR041104 - High Voltage Measurement and diagnostics of insulation** AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering** AND SPECIALIZATION **Industrial Electrical Engineering**

<b>Subject educational effect</b>	<b>Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)</b>	<b>Subject objectives</b>	<b>Programme content</b>	<b>Teaching tool number</b>
PEK_U01	S2ETP_U07	C.1 C.2	Lab2 Lab3 Lab4 Lab8	N.1 N.2
PEK_U02	S2ETP_U07	C.1 C.2	Lab5 Lab6 Lab7 Lab9	N.1 N.2
PEK_K01	K2ETK_K03 K2ETK_K06	C.1 C.2	Lab1 Lab10	N.1 N.2