

Subject (course) name: <b>Safe Use of Electrical Equipment</b>		
Programme: <b>ELECTRICAL ENGINEERING</b> Specialty:		Subject code: <b>6K</b>
		Title graduate: <b>Engineer</b>
Type of course: <b>obligatory</b>	Course level: <b>First-cycle studies</b>	Year: <b>II</b> Semester: <b>IV</b> Semester: <b>summer</b>
Form of classes: <b>Lectures, Classes, Labs, Seminar, Project</b>	Number of hours per week: <b>1L, 0C, 0Lab, 0S, 0P</b>	Credit points: <b>2 ECTS</b>

## **I. GUIDE TO SUBJECT**

### **SUBJECT OBJECTIVES**

C1. Provide students with knowledge in the field of safety usage of electrical equipment.

### **SUBJECT REQUIREMENTS**

1. Knowledge of electrical engineering.
2. Knowledge of measurement parameters and operation of electrical equipment.

### **LERNING OUTCOMES**

EK 1 - The student recognized principles of safety usage of electrical equipment.

EK 2 - The student is able to prepare the safety instructions of electrical equipment.

### **SUBJECT CONTENT**

#### **Form of classes - lectures**

<b>Topic</b>	<b>Hours</b>
<b>W 1</b> – Electrical equipment and installations - introduction.	1
<b>W 2</b> – The impact of current on the human body.	1
<b>W 3</b> – Construction and parameters of the EU, protection classes of electrical equipment, IP, IK sequence; Methods of parameters measurement.	2
<b>W 4</b> – Protection against electric shock, systems network.	1
<b>W 5</b> – Protection during normal exploitation.	1
<b>W 6</b> – Protection people in case of direct contact and indirect.	1
<b>W 7</b> – Measures to protect people working on electrical installations.	1
<b>W 8</b> – Connections compensation.	1
<b>W 9</b> – Warning and informational technology.	1
<b>W 10</b> – Evaluation of fire protection installations above 1 kV.	1
<b>W 11</b> – Safety instructions.	1
<b>W 12</b> – Rescue of the electrocution infected.	1
<b>W 13</b> – Risk assessment.	1
Final test.	1
<b>Total</b>	<b>15</b>

### **STUDY METHODS**

1. Lectures with use of multimedia presentations.
2. Safety instructions.

### **EDUCATIONAL TOOLS**

1. Laws, regulations, standards for electrical equipment.
2. Catalogs of electrotechnical companies.

### **METHODS OF ASSESMENT (F – Forming, P – Summary)**

- P1.** Assessment assimilation of knowledge transferred to the lecture - test.
- P2.** Assessment of implementing health and safety instructions.

## STUDENT WORKLOAD

Form of activity	Averaged workload (hours)		
	[h]	∑ [h]	ECTS
Participation in class activities lectures	15	15	1
Implementation of safety instruction	10	20	1
Preparation for tutorials (reading literature)	5		
Preparation for the test lecture	5		
<b>Total</b>		<b>35</b>	<b>2</b>

### A. BASIC READING

1. Ryan Godsell - "Electrical Machine Principles: A Must Have Guide for Students and Professionals ", RG Kindle Publishing, 2014.
2. Darrel P. Kaiser - "Basic Electrical Troubleshooting for Everyone", Darrel Kaiser Books, 2012.
3. L.W. Brittan - "Electrical Circuit Breakers, Fuses, Protective Relays, and More ", 2015.

### B. FURTHER READING

1. John Cadick - "Electrical Safety Handbook ", McGraw-Hill Education, 2012.
2. Gwen Marston and Cathy Jones - "The Electrical Safety Program Guide", Jones & Bartlett Learning, 2010.

## MATRIX EFFECTS OF EDUCATION IMPLEMENTATION

Learning objectives	In relation to the learning outcomes specified for the field of study	Subject objectives	Study methods	Methods of assessment
EK1	K_W21 K_U24	C1	lecture	P1
EK2	K_W21 K_U24	C1	lecture	P2

## II. FORMS OF ASSESSMENT - DETAILS

Grade*	Outcome
<b>EK1</b>	The student recognized principles of safety usage of electrical equipment.
2	The student can not discuss rules of safety usage of electrical equipment.
3	The student is able to classify the general safety rules.
3,5	The student is able to discuss specific security policies.
4	The student is able to discuss specific security policies and provide protection methods against electric shock.
4,5	The student is able to discuss specific security policies, provide protection methods and means of protection against electric shock.
5	The student is able to discuss specific security policies, provide protection methods and choose the means of protection against electric shock.
<b>EK2</b>	The student is able to develop the safety instructions of electrical equipment.
2	The student is not able to develop a manual safety of electrical equipment..
3	The student is able to develop the safety instructions of electrical equipment at a general level.
3,5	The student is able to develop the safety instructions of electrical equipment in the degree of detail.
4	The student is able to develop the safety instructions of electrical equipment to the extent detailed and provide protection methods.
4,5	The student is able to develop the safety instructions of electrical equipment to the extent detailed, provide protection methods and means of protection against electric shock.
5	The student is able to develop the safety instructions of electrical equipment to the extent detailed, provide protection methods and choose the means of protection against electric shock.

\* 2 (F); 3 (E); 3,5 (D); 4 (C); 4,5 (B); 5 (A).

## III. OTHER USEFUL INFORMATION

- All information for students on the schedule are available on the notice board and on the website: [www.el.pcz.pl](http://www.el.pcz.pl).

2. Information on the consultation shall be provided to students during the first lecture and will be placed on the website [www.el.pcz.pl](http://www.el.pcz.pl).
3. Terms and conditions of credit courses will be provided to students during the first lecture.