

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Instalacje elektryczne w obiektach energetyki**
 Name in English: **Electrical installations of power objects**
 Main field of study (if applicable): **Control Engineering and Robotics**
 Specialization (if applicable): **Automation and Control in Electrical Power Systems**
 Level and form of studies: **2nd level, full-time**
 Kind of subject: **optional**
 Subject code: **ARR042411**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30	15			
Number of hours of total student workload (CNPS):	60	30			
Form of crediting:	examination	crediting with grade			
For group of courses mark (X) final course:					
Number of ECTS points:	2	1			
including number of ECTS points for practical (P) classes :		1			
including number of ECTS points for direct teacher-student contact (BK) classes:	1.40	0.70			

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of devices and equipment.
2. Basic knowledge of electrical engineering.
3. Knowledge of the principles of construction and electrical equipment.

SUBJECT OBJECTIVES

- C1. Knowledge of the principles of construction and electrical equipment.
 C2. Understanding the principles of safe work on electrical equipment.
 C3. Knowledge of calculations of parameters of electrical installations.

SUBJECT EDUCATIONAL EFFECTS*relating to knowledge:*

- PEK_W01 Student has knowledge of the construction electrical installations.
 PEK_W02 Student has knowledge of the protective systems used in electrical installations.
 PEK_W03 Student has knowledge of the rules and regulations for the construction of electrical installations.

relating to skills:

- PEK_U01 Student can determine the expected load in industrial and power objects.
 PEK_U02 Student can select wires and protection device.
 PEK_U03 Student can calculate the effectiveness of shock protection.

relating to social competences:

- PEK_K01 Student is able to think and act in a creative way.

PROGRAMME CONTENT

Form of classes - lecture		Number of hours:
Lec 1	Basic concepts of electrical installations.	2
Lec 2	Network systems.	2
Lec 3	Determination of the expected load in electrical installations.	2
Lec 4	Systems components and circuits, cables, connectors.	2
Lec 5	Overload and short-circuit protection for electrical installations.	2
Lec 6	Selection of wires and protection device.	2
Lec 7	Terms of selective overcurrent protection.	2
Lec 8	Voltage drops in electrical installations.	2
Lec 9	Electric shock protection by automatic disconnection of supply.	2
Lec 10	Grounding and equipotential bonding in electrical installations.	2
Lec 11	Construction of industrial electrical installations.	2
Lec 12	Power needs of its own power stations.	2
Lec 13	Electrical installations of power objects.	2
Lec 14	Fire hazard and ways of mitigation.	2
Lec 15	Lightning protection of power engineering objects.	2
Total hours:		30

Form of classes - class		Number of hours:
Cl 1	Determination of the expected loads in industrial and power plants.	2
Cl 2	Selection of cables and protection - receiver circuit design.	2
Cl 3	Calculation of voltage drop in the electrical system.	2
Cl 4	Calculation of the effectiveness electric shock protection by automatic disconnection of supply.	2
Cl 5	Construction of the installations needs its own power stations.	2
Cl 6	Design of the main and supplementary equipotential bonding.	2
Cl 7	Lightning construction of installations of energy facilities. Overvoltage protection.	2
Cl 8	Additional term and crediting.	1
Total hours:		15

TEACHING TOOLS USED

- N1. Multimedia presentation.
 N2. Informative lecture.
 N3. Calculation exercises.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation <i>F – forming (during semester) P – concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03	Exam
P(w)	P=F1	
F1(c)	PEK_U01 PEK_U02 PEK_U03	activity in the class
F2(c)	PEK_U01 PEK_U02 PEK_U03	test
P(c)	$P = 0,25F1 + 0,75F2$	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

- [1] Markiewicz H. Instalacje elektryczne. WNT, Warszawa 2010.
 [2] Jabłoński W. Zapobieganie porażeniom elektrycznym w urządzeniach elektroenergetycznych WN, WNT, Warszawa 1992.
 [3] Norma arkuszowa PN-IEC 60364. Instalacje elektryczne w obiektach budowlanych.

SECONDARY LITERATURE:

- [1] Ustawa „Prawo budowlane”, wraz z rozporządzeniami wykonawczymi.

SUBJECT SUPERVISOR

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ARR042411 - Electrical installations of power objects
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Control Engineering and Robotics
AND SPECIALIZATION Automation and Control in Electrical Power Systems**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	S2ASE_W12	C.1	Lec1 Lec2 Lec3 Lec4 Lec11 Lec12 Lec13	N.1 N.2
PEK_W02	S2ASE_W12	C.1 C.2	Lec5 Lec7	N.1 N.2
PEK_W03	S2ASE_W12	C.1 C.2	Lec6 Lec7 Lec8 Lec9 Lec10 Lec13 Lec14 Lec15	N.1 N.2
PEK_U01	S2ASE_U11	C.3	CI1	N.3
PEK_U02	S2ASE_U11	C.3	CI2 CI3 CI5	N.3
PEK_U03	S2ASE_U11	C.3	CI4 CI6 CI7	N.3
PEK_K01	K2AiR_K06	C.3	CI1 CI2 CI3 CI4 CI5 CI6 CI7 CI8	N.3