FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Nowoczesne aparaty elektryczne**
Name in English:	**Modern electrical devices**
Main field of study (if applicable):	**Electrical Engineering**
Specialization (if applicable):	**Industrial Electrical Engineering**
Level and form of studies:	**2nd level, part-time**
Kind of subject:	**optional**
Subject code:	**ELR052472**
Group of courses:	**NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	22				
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 :					
including number of ECTS points for direct teacher-student contact (BK) classes:	1.40				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Student is able to discriminate beetwen low and high voltage, and selected parameters of devices, electrical appliances and electrical installations for normal operating conditions and disturbance.
2. Student knows phenomena occurring at the switching operations, including electric arc phenomena and surges.
3. Understands the legal aspects and effects of engineering activities.
4. He can think and act in a creative way.

SUBJECT OBJECTIVES

C1. Knowledge of the design and construction of modern switching devices low and high voltage.
C2. Knowing the possibility of using modern switching devices in power systems and networks.
C3. Developing tendences of new electrical devices
C4. Knowing the need for lifelong learning

SUBJECT LEARNING OUTCOMES

relating to knowledge:

PEU_W01 Student has in-depth knowledge of the design and operation of modern switching devices construction of low and high voltage.

PEU_W02 Student has knowledge of the application of modern switching devices installations and distribution systems.

PEU_W03 Student realizes in the tendencies of development of electrical devices.

relating to skills:

relating to social competences:

PEU_K01 Student understands the need for learning and skills for life.

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours:**
Lec 1	The classification, functions and rating of modern electrical devices.	2
Lec 2	Modern solutions used in backup electrical power systems.	2
Lec 3	Modern installation of reactive power compensation.	2
Lec 4	Switching interferences generated by modern electrical equipment.	2
Lec 5	Materials used in modern electrical devices.	2
Lec 6	Modern electrical equipment with modular structures.	2
Lec 7	Remote operation of modern electrical devices	2
Lec 8	The impact of modern electrical devices on the environment.	2
Lec 9	Reliability of modern electrical devices.	2
Lec 10	Diagnosis of modern electrical devices.	2
Lec 11	Final test	2
	Total hours:	**22**

TEACHING TOOLS USED
N1. Multimedia presentation N2. Lecture information

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation *F – forming (during semester)* *P – concluding (at semester end)*	**Educational effect number**	**Way of evaluating educational effect achievement**
F1(W)	PEU_W01 PEU_W02 PEU_W03 PEU_K01	test
P(W)	P=F1	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] Maksymiuk J., Nowicki J.,: Aparaty elektryczne, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2016 **SECONDARY LITERATURE:** [1] Markiewicz H., Urządzenia Elektroenetgetyczne, PWN, Warszawa 2016 [2] Touran Gonen: Elekctrical Power Transmission System Engeneering: Analysis and Design by CRC Press

SUBJECT SUPERVISOR
Joanna Budzisz, joanna.budzisz@pwr.edu.pl