FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Elektryczne urządzenia zasilające małej mocy**
Name in English:	**Electrical Low Power Supplies**
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:	**ELR051277**
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 has a general knowledge of electronics

SUBJECT OBJECTIVES

C1. The acquisition of knowledge in the principles of operation, construction and application of electrical low power supplies

C2. Acquisition and developing of social skills including emotional intelligence skills involving the cooperation to effective problem solving during team work

SUBJECT LEARNING OUTCOMES

relating to knowledge:

PEU_W01 Student knows the structure and properties of the basic components used in the power systems

PEU_W02 Student knows the principle of operation and properties and rules of power sources with a small power output

relating to skills:

relating to social competences:

PEU_K01 Student is able to act and to think independently and creatively

PROGRAMME CONTENT

	Form of classes - lecture	Number of hours:
Lec 1	Introduction (Lecture program, credits conditions, literature). Passive components of power systems	2
Lec 2	Low power chokes and transformers, selection of magnetic circuits	2
Lec 3	Active components. Heat sources and cooling of components	2
Lec 4	Rectifies	2
Lec 5	Voltage multipliers	2
Lec 6	AC/AC, DC/DC, DC/AC inverters and converters	2
Lec 7	Linear dc stabilizers	2
Lec 8	Impulse stabilizers of dc voltages	2
Lec 9	Chemical electrical power sources	2
Lec 10	Nowaday ctive components of energy converters and IC controlers	2
Lec 11	Other electrical power sources (thermo-, photo-, piezo-elctrical). Energy harvesting. Test	2
	Total hours:	**22**

TEACHING TOOLS USED
N1. Traditional lecture using a multimedia presentation N2. Consultations N3. Student’s own work

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_K01	Test
P(W)	P=F1	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] Borkowski A, Zasilanie Urządzeń Elektronicznych, WKŁ, Warszawa, 1990. [2] Kwaśniewski S. Stabilizatory napięcia. Dane, zastosowania. NEXT, Gdańsk, 1996. [3] Czerwiński A., Akumulatory baterie i ogniwa. WKŁ, Warszawa, 2005. [4] Beeby S., White N., Energy harvesting for autonomous systems, 2010, Artech House 685 Canton Street, Norwood, MA 02062. **SECONDARY LITERATURE:** [1] Brown M. ,Power Supply Cookbook. EDN Series for Design Eng. Newnes ButterworthHeinemann, 2001.

SUBJECT SUPERVISOR
Ryszard Kacprzyk, ryszard.kacprzyk@pwr.edu.pl