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, full-time**
Kind of subject:	**optional**
Subject code:	**ELR051214**
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 :					
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 consolidation of social skills including emotional intelligence skills involving the cooperation to effective problem solving

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 requirements, literature). Organization of low power supply system	2
Lec 2	Passive components of power systems	2
Lec 3	Low frequency choking-coils and low power transformers	2
Lec 4	High frequency choking-coils and low power transformers	2
Lec 5	Heat sources and cooling system of the components	2
Lec 6	Rectifier circuits	2
Lec 7	Voltage multipliers	2
Lec 8	Low frequency filters	2
Lec 9	Active components of energy converters and IC controlers	2
Lec 10	Converters and inverters ac/ac, dc/dc, dc/ac	2
Lec 11	Linear dc stabilizers	2
Lec 12	Impulse stabilizers of dc voltages	2
Lec 13	Chemical electrical power sources	2
Lec 14	Other electrical power sources (thermo-, photo-, piezo-elctrical). Energy harvesting	2
Lec 15	Final test	2
	Total hours:	**30**

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
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