FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Modelowanie systemów OZE**
Name in English:	**Modeling of RES systems**
Main field of study (if applicable):	**Electrical Engineering**
Specialization (if applicable):	**Renewable Energy Sources**
Level and form of studies:	**2nd level, full-time**
Kind of subject:	**optional**
Subject code:	**ELR041320**
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. The basic knowledge of electrical circuit theory and programming in Matlab.

SUBJECT OBJECTIVES

C1. Acquaint students with the methods of computer modeling of renewable energy systems.
C2. Increasing knowledge of the understanding and application of computer simulation RES systems.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEK_W01 Has an extended knowledge of the simulation in Matlab of elements of electrical circuits.
PEK_W02 He knows the methods of modeling RES systems.

relating to skills:

relating to social competences:

PEK_K01 Is able to think act and in a creative manner.

PROGRAMME CONTENT		
Form of classes - lecture		**Number of hours:**
Lec 1	Introduction. Basic elements of Matlab language.	2
Lec 2	Advanced elements of Matlab language.	2
Lec 3	Electrical Power system simulation library Power System Blockset.	2
Lec 4	Modeling of electrical power system elements – selected topics.	2
Lec 5	Computer models of renewable energy sources.	2
Lec 6	Solving differential equations in the program Matlab.	2
Lec 7	Simulation of electrical circuits in steady states.	2
Lec 8	Simulation of electrical circuits in transient.	2
Lec 9	Power line model with distributed parameters	2
Lec 10	Simulation of faults of power line.	2
Lec 11	Design of power system with renewable energy sources.	2
Lec 12	Simulation of the power system with renewable energy sources.	2
Lec 13	Influence of the parameters the model on the results of the analysis.	2
Lec 14	Summary of lecture topics. Conclusions and comments.	2
Lec 15	Final test.	2
	Total hours:	**30**

TEACHING TOOLS USED
N1. Lectures using multimedia tools.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation *F – forming (during semester)* *P – concluding (at semester end)*	**Educational effect number**	**Way of evaluating educational effect achievement**
F1(W)	PEK_W01 PEK_W02 PEK_K01	Written test.
P(W)	P=F1	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
[1] Mathworks, „Power System Blockset- User Guide” 2000 [2] Z. Lubośny, „”Elektrownie wiatrowe w systemie elektroenergetycznym” 2007
SECONDARY LITERATURE:
[1] A. V. Oppenheim, R. W. Schafer „Cyfrowe przetwarzanie sygnałów“ 1989 [2] A. Papoulis „Obwody i układy” 1988

SUBJECT SUPERVISOR
Jacek Rezmer, jacek.rezmer@pwr.edu.pl

MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ELR041320 - Modeling of RES systems
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**
AND SPECIALIZATION **Renewable Energy Sources**

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	S2OZE_W16	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14	N.1
PEK_W02	S2OZE_W16	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14	N.1
PEK_K01	K2ETK_K06	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14 Lec15	N.1