FACULTY OF ELECTRICAL ENGINEERING

SUBJECT CARD

Name in Polish:	**Ochrona odgromowa i przepięciowa**
Name in English:	**Lightning and overvoltage protection**
Main field of study (if applicable):	**Electrical Engineering**
Specialization (if applicable):	**Electrical Power Engineering**
Level and form of studies:	**2nd level, full-time**
Kind of subject:	**obligatory**
Subject code:	**ELR051107**
Group of courses:	**NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	15		15		
Number of hours of total student workload (CNPS):	60		30		
Form of crediting:	crediting with grade		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. Basic knowledge of electrical engineering and high-voltage technology

SUBJECT OBJECTIVES

C1. Gaining knowledge about the techniques of lightning and surge protection

C2. Gaining skills of the measurement range the properties of selected surge protection devices

SUBJECT LEARNING OUTCOMES

relating to knowledge:

PEU_W01 The student has knowledge about the high-voltage pulse exposures

PEU_W02 The student is become familiar with the devices to overvoltage protection of a building

relating to skills:

PEU_U01 The student can examine the basic properties of surge arresters

PEU_U02 The student can select the devices to surge protection

relating to social competences:

PEU_K01 Is aware about the importance and non-technical aspects of engineering activities, i.e. influence on environment, therefore takes responsible actions.

PROGRAMME CONTENT

	Form of classes - lecture	Number of hours:
Lec 1	The preliminary, introduction to the problems of the subject	2
Lec 2	Lightning strikes	2
Lec 3	Lightning protection system	2
Lec 4	Lightning protection levels	2
Lec 5	Surge arresters	2
Lec 6	Reducing surge in the overhead installations	2
Lec 7	Protection of power stations	2
Lec 8	Test	1
	Total hours:	**15**

Form of classes - laboratory		Number of hours:
Lab 1	Preface, knowing with the rules of laboratory work, health and safety knowing	3
Lab 2	The study of static characteristics of surge protection elements	3
Lab 3	The study of dynamic characteristics of surge protection elements	3
Lab 4	Research of the surge arresters for medium voltage lines	3
Lab 5	Catch up for overdue exercise, credit lab	3
	Total hours:	**15**

TEACHING TOOLS USED
N1. Traditional lecture using multimedia presentation
N2. Student's own work
N3. Laboratory test conducted in the traditional manner by the students exercise group
N4. Reports of the laboratory exercises

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	
F1(L)	PEU_U01 PEU_U02 PEU_K01	Checking and evaluation of the preparation to laboratory exercises
F2(L)	PEU_U01 PEU_U02 PEU_K01	Evaluation of the reports from performed researches
P(L)	P=0,5 F1+0,5 F2	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Sowa A., Kompleksowa ochrona odgromowa i przepięciowa. Biblioteka COSiW SEP, Warszawa 2005.
[2] Szpor St., Samuła J., Ochrona odgromowa, tom 1, wiadomości podstawowe, WNT 1983.
[3] Szpor St., Ochrona odgromowa, tom2, Ochrona urz. elektroenergetycznych, WNT 1975.
[4] Szpor St., Ochrona odgromowa, tom 3, Piorunochrony, WNT 1978.

SECONDARY LITERATURE:

[1] Dehn + Soehne, Lightning protection guide. 2007.
[2] Uman M.A., The art and science of lightning protection. Cambridge University Press 2008.

SUBJECT SUPERVISOR

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