

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Elektryczne urządzenia odbiorcze**  
 Name in English: **Electrical receiver**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable):  
 Level and form of studies: **1st level, full-time**  
 Kind of subject: **optional**  
 Subject code: **ELR052404**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30		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. Knowledge of mathematics and physics that allows the understanding of physical phenomena occurring in the thermogeneration and thermokinetic process
2. Basic knowledge of electrical engineering
3. Student can use meters of voltage, current, power, temperature and light of basic measurements
4. Student is able to statistically analyze experimental data and interpret the results
5. Student is able to work in a team
6. Student is able to think and act in a creative way

**SUBJECT OBJECTIVES**

- C1. Recognition of physical phenomena in equipment, which convert electric energy in to the light.  
 C2. Recognition of physical phenomena in equipment, which convert electric energy in to the heat  
 C3. Ability to perform measurements of light and designation of the operating characteristics of electrothermal equipment.

**SUBJECT LEARNING OUTCOMES***relating to knowledge:*

- PEU\_W01 Student identifies and distinguishes the source of light, can describe physical phenomena in equipment, which convert electric energy into the light.  
 PEU\_W02 Student identifies the electrothermal equipment, can describe physical phenomena in equipment, which convert electric energy into the heat.  
 PEU\_W03 Student can name types and parameters of light sources and electrothermal devices and practically use lighting design rules

*relating to skills:*

- PEU\_U01 Student can set basic parameters of electric light sources  
 PEU\_U02 Student is able to regulate the temperature of the resistance furnace and can determine the parameters of the electrothermal devices  
 PEU\_U03 Student is able to establish the basic operating characteristics of the electric arc furnace

*relating to social competences:*

- PEU\_K01 Student learns to think and act in a creative way, and learns to work in teams

## PROGRAMME CONTENT

Form of classes - lecture		Number of hours:
Lec 1	Conversion of electric energy on the useful energy forms	2
Lec 2	Thermogeneration and thermokinetic process. Heat losses	2
Lec 3	Three-dimensional distribution of the luminous flux	2
Lec 4	Electric light sources	2
Lec 5	Criteria of quality illumination	2
Lec 6	Ergonomic illumination design. Point-by-point and efficiency method	2
Lec 7	Control of illumination	2
Lec 8	Resistance materials. Electrothermal resistance conversion	2
Lec 9	Resistance direct-heat and indirect-heat furnace	2
Lec 10	Direct arc and indirect arc furnace	2
Lec 11	Induction furnace	2
Lec 12	Capacitive heating device	2
Lec 13	Radial metod of preheat	2
Lec 14	Temperature regulation and control electroheat equipment	2
Lec 15	Final test	2
Total hours:		<b>30</b>

Form of classes - laboratory		Number of hours:
Lab 1	Presentation of the rules of procedure health and safety in Laboratory. Establishment of passing rules. Rules of the drafting of reports from the laboratory. Laboratory exercises discussion.	2
Lab 2	Luminous flux measurements	2
Lab 3	Investigation of electric light sources and electric light fitting	2
Lab 4	Investigation of arc furnace model	2
Lab 5	Investigation of heating and self-cooling process of resistance furnace	2
Lab 6	Investigation of spot-welding machine	2
Lab 7	Investigation of microwave oven	2
Lab 8	Assessment and complementary laboratory backlogs	1
Total hours:		<b>15</b>

## TEACHING TOOLS USED

- N1. Multimedia presentation  
 N2. Information lecture  
 N3. Measuring position

## EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation <i>F - forming (during semester) P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEU_W01 PEU_W02 PEU_W03	Class attendance
F2(w)	PEU_W01 PEU_W02 PEU_W03	Test
P(w)	$P=0,1F1+0,9F2$	
F1(L)	PEU_U01 PEU_U02 PEU_U03	Activity in laboratory classes
F2(L)	PEU_U01 PEU_U02 PEU_U03	Laboratory report
P(L)	$P=0,25F1+0,75F2$	

<b>PRIMARY AND SECONDARY LITERATURE</b>
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<b>PRIMARY LITERATURE:</b>
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Masny J, Teresiak Z.: Przemiany energii elektrycznej, WNT, Warszawa 1985 Hering M.: Podstawy elektrotermii, Cz.1., WNT, Warszawa 1992 Hering M.: Podstawy elektrotermii, Cz.2., WNT, Warszawa 1998
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<b>SECONDARY LITERATURE:</b>
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Rodacki T.: Urządzenia elektrotermiczne. Warszawa 2002 Żagan W.: Podstawy techniki świetlnej, Warszawa, 2004
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<b>SUBJECT SUPERVISOR</b>
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