

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Systemy pomiarowe i teleinformatyczne w elektrotechnice**  
 Name in English: **Measuring systems in the electrical engineering**  
 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: **obligatory**  
 Subject code: **ELR041316**  
 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):	30		30		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	1		1		
including number of ECTS points for practical (P) classes :			1		
including number of ECTS points for direct teacher-student contact (BK) classes:	0.70		0.70		

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. Has basic knowledge about functionalities of IT systems
2. Has knowledge about ANSI C/ PASCAL programming

**SUBJECT OBJECTIVES**

- C1. basic knowledge about transmission preparation and ICT data processing technology  
 C2. preparation for problem solving in a design team

**SUBJECT EDUCATIONAL EFFECTS***relating to knowledge:*

- PEK\_W01 has knowledge about computer communication and data exchange for engineering purposes  
 PEK\_W02 has knowledge about network event modeling

*relating to skills:*

- PEK\_U01 is able to source information about establishing connection from literature and other sources  
 PEK\_U02 is able to implement communication procedures in the Windows operating system

*relating to social competences:*

- PEK\_K01 is able to evaluate design team performance and perform a critical analysis

**PROGRAMME CONTENT**

<b>Form of classes - lecture</b>		<b>Number of hours:</b>
Lec 1	Objectives and tasks of ICT networks for engineering purposes	2
Lec 2	The program structure and data types and objects integrated with the operating system	2
Lec 3	Topology and logical organization of ICT network	2
Lec 4	Selected elements of network connections: Ethernet, Token Ring, Wi-Fi, Bluetooth, USB, RS232, RS485, GPIB	2
Lec 5	Communication in client-server model - programming of the control events	2
Lec 6	Application layer protocols on the example of HTTP, FTP and custom protocols rules for implementing the user	2
Lec 7	Client-server communication model. The notion of "thin" client. Data storage and process servers	2
Lec 8	Final test	1
Total hours:		<b>15</b>

Form of classes - laboratory		Number of hours:
Lab 1	Network programming in ANSI C/ PASCAL	2
Lab 2	The program structure and data types and objects integrated with the operating system	2
Lab 3	Support local ports - analysis and modification of the exemplary	2
Lab 4	Support network ports - analysis and modification of the exemplary	2
Lab 5	Communication in client-server model - programming of the control events	2
Lab 6	Programming user application - working in groups	2
Lab 7	Programming user application - working in groups - application testing	2
Lab 8	Laboratory assessment	1
Total hours:		<b>15</b>

TEACHING TOOLS USED
N1. introductory lecture with slideshow and elements of e-learning N2. students code case-based programmes both individually and in teams N3. remote self-education - <a href="http://eportal.eny.pwr.edu.pl">http://eportal.eny.pwr.edu.pl</a> - partialy and final tests N4. consultation

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F - forming (during semester)</i> <i>P - concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02	Remote self-teaching - partial test. E-learning platform: <a href="http://eportal.eny.pwr.edu.pl">http://eportal.eny.pwr.edu.pl</a>
F2(w)	PEK_W01 PEK_W02	the final test in the computer laboratory using educational platform: <a href="http://eportal.eny.pwr.edu.pl">http://eportal.eny.pwr.edu.pl</a>
P(w)	$P=0.15 \times F1 + 0.85 \times F2$	
F1(L)	PEK_U01 PEK_U02 PEK_K01	Development of electronic educational platform partial reports: <a href="http://eportal.eny.pwr.edu.pl">http://eportal.eny.pwr.edu.pl</a>
P(L)	$P=F1$	

PRIMARY AND SECONDARY LITERATURE
<b>PRIMARY LITERATURE:</b> [1] Przewodnik po sieciach lokalnych, Greg Nunemacher, MIKOM (any edition) [2] Programowanie w ANSI C, HELION (any edition) [3] E-learning platform: <a href="http://eportal.eny.pwr.edu.pl">http://eportal.eny.pwr.edu.pl</a> [4] Net-literature <b>SECONDARY LITERATURE:</b> [1] Nowoczesne sieci miejskie, J.Jaworski, R.Morawski, J.Olędzki, WNT(any edition) [2] Programowanie w DELPHI, Helion (any edition) [3] JAVA Kompendium programisty, Helion, (any edition)

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
**ELR041316 - Measuring systems in the electrical engineering**  
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_W07 S2OZE_W08	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8	N.1 N.3 N.4
PEK_W02	S2OZE_W07 S2OZE_W08	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8	N.1 N.3 N.4
PEK_U01	S2OZE_U06	C.1 C.2	Lab1 Lab2 Lab3 Lab4 Lab5 Lab6 Lab7	N.2 N.4
PEK_U02	S2OZE_U06	C.1 C.2	Lab1 Lab2 Lab3 Lab4 Lab5 Lab6 Lab7	N.2 N.4
PEK_K01	K2ETK_K06	C.2	Lab5 Lab6 Lab7 Lab8	N.2 N.4