

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Instalacje inteligentne**
 Name in English: **Intelligent installations**
 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: **ELR042306**
 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		60		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	1		2		
including number of ECTS points for practical (P) classes :			2		
including number of ECTS points for direct teacher-student contact (BK) classes:	0.70		1.40		

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. He has a basic knowledge concerning the topology and elements of receiving electrical installations.
2. Student is able to use basic computer hardware and software.

SUBJECT OBJECTIVES

- C1. Understanding what idea of the intelligent building, building system technology and idea of the intelligent installation consist in.
- C2. Acquiring knowledge in the field of topology, physical and logical structure of chosen solutions of intelligent installation systems and getting to know of basic tool software used for system configuration.
- C3. Developing the practical ability of using devices applied in intelligent installations.
- C4. Getting to know general rules of planning intelligent installations on the example of chosen building automation systems.
- C5. Acquiring and grounding the ability of the safe work by electrical equipment constituting elements of an intelligent installation.
- C6. Acquiring practical abilities of planning and launching simple arrangements of intelligent installations in chosen building automation systems with using products of various manufacturers.
- C7. Acquiring and strengthening social competencies concerning the ability of cooperating in the team, simultaneously self-dependence, responsibility and reliability in the proceedings, awareness of effects of engineering actions taken.

SUBJECT EDUCATIONAL EFFECTS*relating to knowledge:*

- PEK_W01 He knows the fundamental assumptions of the intelligent building, the building system technology and the intelligent installation. He has basic knowledge concerning systems of intelligent installations applied in practice, knows their basic advantages and disadvantages, is able to compare them objectively.
- PEK_W02 He has a detailed and verified practically knowledge in the field of the construction and operation of chosen intelligent installation systems.
- PEK_W03 He has knowledge about the catalogue base of the equipment used in intelligent electrical installations.

relating to skills:

- PEK_U01 He is able to create intelligent installation design in the chosen building automation system.
- PEK_U02 He is able to program, put into operation, test the chosen intelligent installation and make changes in the operation of the arrangement.

relating to social competences:

- PEK_K01 He is able to collaborate with the team on the accomplishment of assumed tasks.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Preliminary information about the intelligent building, building management system (BMS) and the localization of the intelligent installation.	2
Lec 2	Relay systems of intelligent installations	2
Lec 3	Digital control systems of intelligent installations. The bus system, methods of coding data and signal transmission.	2
Lec 4	General characteristics of the KNX system. The role of the KNX Association (KONNEX). Topology of the KNX system. Division and construction of bus devices and system components. The physical address of bus devices.	2
Lec 5	The structure of the telegram and the method of coding data in the KNX system. Manner of communication with the TP, RF and PL use. The role of the choke in the power supply. The logical structure of the KNX system and group addresses. Assign communications objects into the addressing groups.	2
Lec 6	The ETS tool software (the overall structure, assuming the project and planning the control functions, program communication with system components and bus devices, putting into operation the installation). The LCN system. The internal structure of the module, the module designs, system topology.	2
Lec 7	The LCN system expandability. The LCN-PRO tool software. Programming of the LCN installation function. Intelligent wireless systems.	2
Lec 8	Final colloquium.	1
Total hours:		15

Form of classes - laboratory		Number of hours:
Lab 1	Presentation of the rules of Procedure Health and Safety (PHS) and internal regulations of laboratory. Presentation of the rules of complete the course and laboratory stands.	2
Lab 2	Installation in the KNX system.	2
Lab 3	Installation in the KNX system.	2
Lab 4	Installation in the LCN system.	2
Lab 5	Installation in the LCN system.	2
Lab 6	The additional chosen systems of intelligent installation.	2
Lab 7	The additional chosen systems of intelligent installation.	2
Lab 8	Final rating.	1
Total hours:		15

TEACHING TOOLS USED
<p>N1. Information lecture with audio-visual techniques.</p> <p>N2. Problema discussion.</p> <p>N3. Software tools to design and programming the intelligent installations.</p> <p>N4. Laboratory exercises conducted in groups of students.</p> <p>N5. Personal consultations.</p> <p>N6. Develop the reports of performed exercises.</p>

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 PEK_W03	Final colloquium.
P(W)	P=F1	
F1(L)	PEK_U01 PEK_U02	Oral questions or written test (check preparation for classes).
F2(L)	PEK_U01 PEK_U02 PEK_K01	Activity during classes.
F3(L)	PEK_U01 PEK_U02 PEK_K01	Reports from the laboratory classes.
P(L)	P=0,5F1+0,3F2+0,2F3	

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Markiewicz H., Instalacje elektryczne, Wyd. 8, WNT, Warszawa, current edition

SECONDARY LITERATURE:

- [1] PN-EN 50090 Domowe i budynkowe systemy elektroniczne (HBES);
- [2] Klajn A., Bielówka M., Instalacja elektryczna w systemie KNX/EIB, Informacje o Normach i Przepisach Elektrycznych – Miesięcznik Stowarzyszenia Elektryków Polskich, Podręcznik dla Elektryków – Zeszyt 10, Warszawa 2006;
- [3] <http://www.knx.org/pl/>
- [4] <http://www.lcn.pl>
- [5] Selected websites of manufacturers of intelligent installation systems indicated by the teacher.

SUBJECT SUPERVISOR

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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT **ELR042306 - Intelligent installations** AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**

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	K1ETK_EEN_W08	C.1 C.2 C.4	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7	N.1 N.2 N.5
PEK_W02	K1ETK_EEN_W08	C.2 C.4 C.6	Lec2 Lec3 Lec4 Lec5 Lec6 Lec7	N.1 N.2 N.5
PEK_W03	K1ETK_EEN_W08	C.4 C.5 C.6	Lec2 Lec4 Lec6 Lec7	N.1 N.2 N.5
PEK_U01	K1ETK_EEN_U05	C.4 C.6	Lab2 Lab3 Lab4 Lab5 Lab6	N.2 N.3 N.4 N.5 N.6
PEK_U02	K1ETK_EEN_U05	C.3 C.5 C.6	Lab2 Lab3 Lab4 Lab5 Lab6 Lab7	N.2 N.3 N.4 N.5 N.6
PEK_K01	K1ETK_K05 K1ETK_K09	C.7	Lab1 Lab2 Lab3 Lab4 Lab5 Lab6 Lab7 Lab8	N.2 N.3 N.4 N.5 N.6