

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Konwencjonalne i inteligentne instalacje elektryczne**  
 Name in English: **Conventional and Intelligent installations**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable): **Industrial Electrical Engineering**  
 Level and form of studies: **2nd level, full-time**  
 Kind of subject: **optional**  
 Subject code: **ELR042313**  
 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. He has basic knowledge in the field of electrical devices.
2. He knows the basic principles for the design of low voltage electrical installations.
3. He understands the need of continuous education and knows possibilities of improving professional competencies.

**SUBJECT OBJECTIVES**

- C1. Acquiring knowledge in the field of requirements for conventional and intelligent electrical installations.  
 C2. Getting to know how to plan and assemble electrical installations in industrial and municipal buildings.  
 C3. Getting to know principles for the development of technical documentation in the electrical installations section.  
 C4. Acquiring knowledge concerning the cooperation of conventional electrical installations with building automation systems and requirements put for the intelligent building and the intelligent installation.  
 C5. 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.  
 C6. Getting to know general rules of planning intelligent installations on the example of chosen building automation systems.

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

- PEK\_W01 Is able to characterize the basic regulations and standards for the conventional and intelligent electrical installations, methods of assembly installations and rules compile technical documentation of installation..  
 PEK\_W02 The student should be able to explain fundamental assumptions of the intelligent building, the building system technology and the intelligent electrical installation  
 PEK\_W03 Student should be able to describe and characterize the sample of systems of intelligent installations applied in practice, their basic advantages and disadvantages and principles of planning the installation in the selected system.

*relating to skills:**relating to social competences:*

- PEK\_K01 Student will be oriented to learning new knowledge in the field of modern installation technologies.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Characteristics of conventional and intelligent electrical installation. The technical requirements and specifications for the both types of electrical installations. The component parts of industrial and municipal installation. The basic regulations and standards for electrical installations.	2
Lec 2	The methods of assembly of the electrical installations in industrial and municipal buildings. The electrical equipment.	2
Lec 3	Rules of planning the electrical installations in industrial and municipal buildings. Determination of power requirements.	2
Lec 4	The electric wiring and and electric power cables and methodology of selection. The circuit protection devices in electrical installations.	2
Lec 5	The technical documentation of electrical installation. CAD and computer assisting of developing the technical documentation.	2
Lec 6	The notion of intelligent installation and intelligent building. Classification of building automation systems.	2
Lec 7	Intelligent relay systems.	2
Lec 8	General characteristics digitally-controlled systems. Manners of realization of digital transmission. General characteristics of the KNX system of installation. The KNX Association (KONNEX).	2
Lec 9	Characteristics of the bus devices and system components, the KNX system topology. The methods of assembly the installation.	2
Lec 10	The logical structure of the KNX system. The group addresses and addressing groups. The digital telegram structure.	2
Lec 11	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).	2
Lec 12	Characteristics of the LCN system - the system topology and the bus devices structure. The methods of assembly of the installation.	2
Lec 13	The logical structure of the LCN system. The LCN-PRO tool software.	2
Lec 14	Wireless systems of intelligent electrical installations.	2
Lec 15	Final colloquium.	2
Total hours:		<b>30</b>

TEACHING TOOLS USED
N1. Information lecture with audio-visual techniques.
N2. A discussion of problematic.
N3. Personal consultations.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F – forming (during semester) P – concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03 PEK_K01	Colloquium
P(w)	P=F1	

PRIMARY AND SECONDARY LITERATURE
<b>PRIMARY LITERATURE:</b> <p>[1] Markiewicz H., Instalacje elektryczne, WNT, Warszawa, current edition</p> <p>[2] Dołęga W., Kobusiński M., Projektowanie instalacji elektrycznych w obiektach przemysłowych. Zagadnienia wybrane., Oficyna Wydawnicza PWr, Wrocław 2009</p> <p>[3] Ustawa z dnia 7 lipca 1994 - Prawo budowlane (tekst jednolity: DzU 2006r. Nr 156, poz. 1118) z późn. zm. z dnia 10 maja 2007 r. (Dz. U. Nr 99, poz. 665), 19 września 2007r. (DzU Nr 191 poz.1373), 8 października 2008 r. (DzU Nr 206, poz. 1287), 26 czerwca 2008r. (DzU Nr 145, poz. 914) oraz z dnia 6 maja 2010 r.(DzU Nr 121, poz. 809) <a href="http://www.isip.sejm.gov.pl/prawo/index.html">http://www.isip.sejm.gov.pl/prawo/index.html</a>.</p> <p>[4] Rozporządzenie Ministra Infrastruktury z dnia 12 kwietnia 2002 r. w sprawie warunków technicznych jakim powinny odpowiadać budynki i ich usytuowanie. (DzU nr 75, poz. 690) z późn. zm. z dnia 13 lutego 2003 r. (DzU Nr 33, poz. 270) z dnia 7 kwietnia 2004r. (DzU Nr 109, poz. 1156), z dnia 6 listopada 2008 r. (DzU Nr 201, poz. 1238) oraz z dnia 12 marca 2009r. (DzU Nr 56, poz. 461), <a href="http://www.isip.sejm.gov.pl/prawo/index.html">http://www.isip.sejm.gov.pl/prawo/index.html</a></p> <p>[5] PN-IEC 60364 Instalacje elektryczne w obiektach budowlanych. Norma wieloarkuszowa.</p> <p>[6] Norma SEP-E-0002: 2002. Instalacje elektryczne w obiektach budowlanych. Instalacje elektryczne w budynkach mieszkalnych. Podstawy planowania. *)</p> <p>[7] PN_EN 60617. Symbole graficzne stosowane w schematach. Norma wieloarkuszowa.</p> <p>*) Title available from the teacher.</p> <b>SECONDARY LITERATURE:</b> <p>[1] PN-EN 50090 Domowe i budynkowe systemy elektroniczne (HBES)</p> <p>[2] <a href="http://www.konnex.org.pl">http://www.konnex.org.pl</a></p> <p>[3] <a href="http://www.lcn.pl">http://www.lcn.pl</a></p> <p>[4] <a href="http://automatykabudynku.pl">http://automatykabudynku.pl</a></p>

**SUBJECT SUPERVISOR**

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
ELR042313 - Conventional and Intelligent installations  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY Electrical Engineering  
AND SPECIALIZATION Industrial Electrical Engineering**

<b>Subject educational effect</b>	<b>Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)</b>	<b>Subject objectives</b>	<b>Programme content</b>	<b>Teaching tool number</b>
PEK_W01	S2ETP_W13	C.1 C.2 C.3	Lec1 Lec2 Lec3 Lec4 Lec5 Lec15	N.1 N.2 N.3
PEK_W02	S2ETP_W13	C.4	Lec6 Lec15	N.1 N.2 N.3
PEK_W03	S2ETP_W13	C.5 C.6	Lec7 Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14 Lec15	N.1 N.2 N.3
PEK_K01	K2ETK_K01	C.4 C.5 C.6	Lec6 Lec7 Lec8 Lec9 Lec10 Lec11 Lec12 Lec13 Lec14 Lec15	N.1 N.2 N.3