

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Projektowanie instalacji elektrycznych**  
 Name in English: **Design of electrical installations**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable):  
 Level and form of studies: **1st level, part-time**  
 Kind of subject: **optional**  
 Subject code: **ELR041370**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	10			20	
Number of hours of total student workload (CNPS):	27			54	
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. Has a basic knowledge of electrical design rules.
2. He can choose the elements of the low-voltage electrical installations and calculate their parameters.
3. Is able to prepare and carry out the calculation of short-circuit currents in three-phase and single-phase circuit.
4. Is able to use computer aided software design process.
5. Can obtain information from literature, databases, and other sources.
6. Can make drawings in the form of a sketch and using the computer program. Can create and read technical documentation including drawings of electrical installations.

**SUBJECT OBJECTIVES**

- C1. Provide basic knowledge of laws and standards in the field of special electrical design of selected buildings, with particular emphasis on conditions of increased risk of electric shock, ignition or explosion.
- C2. The ability to perform electrical design of selected buildings, with particular emphasis on conditions of increased risk of electric shock, ignition or explosion. Is ability to prepare technical documentation of the project.

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

- PEK\_W01 Has knowledge of the rules and regulations governing the exercise of electrical installation projects, with particular emphasis on conditions of increased risk of electric shock, ignition or explosion.
- PEK\_W02 Knows the rules for the planning and design of low-voltage electrical installations in industrial and public utility.
- PEK\_W03 Can choose the elements of low-voltage electrical installations and calculate their parameters and has the knowledge necessary for the preparation of the complete technical documentation of the project.

*relating to skills:*

- PEK\_U01 Can design the electrical system in accordance with the relevant legislation.
- PEK\_U02 Is able to perform electrical design of selected buildings, with particular emphasis on conditions of increased risk of electric shock, ignition or explosion and can prepare a technical documentation of the project.

*relating to social competences:*

- PEK\_K01 Can think and act in a creative and enterprising right solution. Has a sense of responsibility for their own work and a willingness to comply with the principles of teamwork. Show concern for the execution of the tasks assigned.

## PROGRAMME CONTENT

Form of classes - lecture		Number of hours:
Lec 1	Introduction. Familiar with the subject, and the way credit requirements.	1
Lec 2	Legal basis standardizing electrical systems. Types of existing legislation. Special installations for buildings.	2
Lec 3	The conditions and rules for the selection of electrical installations buildings, with particular emphasis on the increased risk of electrical shock, ignition or explosion.	2
Lec 4	The conditions and rules for the selection of fire protection systems in public buildings.	2
Lec 5	Principles of design. Guidelines from the investor. The nature and purpose of the object. Industry data. Technical connection conditions. Reconciliation of Inter. Arrangements official. Obtaining a building permit.	2
Lec 6	Colloquium	1
Total hours:		<b>10</b>

Form of classes - project		Number of hours:
Proj 1	Familiar with the subject, and the way credit requirements. Distribution of project tasks. Discussion of the design proces.	1
Proj 2	Legal framework of the special facilities and utilities.	4
Proj 3	Design rules for special installations.	2
Proj 4	Project of the selected object in an individual or team. Consultation. Discussions problem.	9
Proj 5	Defense projects.	4
Total hours:		<b>20</b>

## TEACHING TOOLS USED

- N1. Lecture using traditional techniques, audiovisual, multimedia presentations, transparencies.  
 N2. Individual project or a problem in the exercises student groups.

## 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	colloquium
P(w)	P=F1	
F1(p)	PEK_U01 PEK_U02 PEK_K01	evaluation of the project.
F2(p)	PEK_W01 PEK_W02 PEK_W03 PEK_U01 PEK_U02 PEK_K01	the defense of the project
F3(p)	PEK_U01 PEK_U02 PEK_K01	participated in discussions of problem
P(p)	$P=0,3 \times F1 + 0,5 \times F2 + 0,2 \times F3$	

## PRIMARY AND SECONDARY LITERATURE

### PRIMARY LITERATURE:

- [1] Markiewicz H.: Instalacje elektryczne, wyd. VIII, WNT, Warszawa 2012.
- [2] Markiewicz H.: Bezpieczeństwo w elektroenergetyce, wyd. III, Warszawa, WNT 2009.
- [3] Markiewicz H., Urządzenia elektroenergetyczne, Wyd. 4, WNT, Warszawa 2008
- [4] Dolega W., Kobusiński M., Projektowanie instalacji elektrycznych w obiektach przemysłowych. Zagadnienia wybrane., Wyd. II, Oficyna Wydawnicza PWR, Wrocław 2012
- [5] 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 2004 (DzU Nr 109, poz. 1156), z dnia 6 listopada 2008 r. (DzU Nr 201, poz. 1238) oraz z dnia 12 marca 2009 r. (DzU Nr 56, poz. 461), <http://www.isip.sejm.gov.pl/prawo/index.html>.

### SECONDARY LITERATURE:

- [1] 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 2008 ( DzU N 145, poz. 914) oraz z dnia 6 maja 2010 r.(DzU Nr 121, poz. 809) <http://www.isip.sejm.gov.pl/prawo/index.html>. Katalog ELEKTRO SPARK.
- [2] PN-IEC 60364 Instalacje elektryczne w obiektach budowlanych oraz inne Polskie Normy.
- [3] <http://www.e-portal.pwr.wroc.pl>
- [4] Witryna dydaktyczna Zakładu Urządzeń Elektroenergetycznych Instytutu Energoelektryki Pwr, <http://www.zue.pwr.wroc.pl/dydaktyka> Serwis publikujący materiały i informacje z dziedziny elektryki, <http://bezel.com.pl>
- [5] Katalogi produktów producentów z branży elektrycznej.

**SUBJECT SUPERVISOR**

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**MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
ELR041370 - Design of electrical installations  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY 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	K1ETK_W32 K1ETK_ETP_W04	C.1	Lec1 Lec2	N.1
PEK_W02	K1ETK_W32 K1ETK_ETP_W04	C.1 C.2	Lec3	N.1
PEK_W03	K1ETK_W32 K1ETK_ETP_W04	C.2	Lec4 Lec5	N.1
PEK_U01	K1ETK_U05 K1ETK_U09 K1ETK_U11 K1ETK_U26 K1ETK_U33 K1ETK_ETP_U02	C.1 C.2	Proj2 Proj3 Proj4 Proj5	N.1 N.2
PEK_U02	K1ETK_U05 K1ETK_U09 K1ETK_U11 K1ETK_U26 K1ETK_U33 K1ETK_ETP_U02	C.1 C.2	Proj2 Proj3 Proj4 Proj5	N.1 N.2
PEK_K01	K1ETK_K05 K1ETK_K09	C.2	Lec6 Proj1 Proj4	N.1 N.2