

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Komputerowe systemy CAD projektowania w elektroenergetyce**  
 Name in English: **Computer Aided Design (CAD) in Energetic**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable): **Industrial Electrical Engineering**  
 Level and form of studies: **2nd level, part-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR052371**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	22		11		
Number of hours of total student workload (CNPS):	60		60		
Form of crediting:	crediting with grade		crediting with grade		
For group of courses mark (X) final course:					
Number of ECTS points:	2		2		
including number of ECTS points for practical (P) classes :			2		
including number of ECTS points for direct teacher-student contact (BK) classes:	1.40		1.40		

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

1. Student has structured and theoretically founded knowledge necessary for planning. and design of low-voltage electrical installations in industrial and municipal.
2. He has knowledge in the field of technical standards and regulations.
3. He can read design assumptions and the design of low-voltage electrical installations.
4. He able to develop project documentation in accordance with applicable regulations and standards.
5. He able to work in a team and understands the need for continuous training.

**SUBJECT OBJECTIVES**

- C1. Familiarize students with the basic advantages and disadvantages of CAD software used in the design of electrical installation and electrical equipment.  
 C2. Familiarize students with CAD programs to design low voltage electrical installation and interpretation of the results.  
 C3. Familiarize students with CAD programs to design the interior lighting and exterior, and the interpretation of the results.  
 C4. Familiarize students with CAD programs to design low voltage electrical switchgear. and interpretation of the results.  
 C5. Familiarize students with CAD programs to create project documentation and interpretation of the results.

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

- PEU\_W01 The student has knowledge about the principles of designing low voltage electrical installations , indoor and outdoor lighting , low-voltage switchgear and design documentation.  
 PEU\_W02 The student has knowledge about the use of CAD software in the design of electric power.

*relating to skills:*

- PEU\_U01 The student is able to interpret design intent in the field of electrical installations and lighting.  
 PEU\_U02 The student is able to design the electrical system and lighting using CAD software and interpret the results.

*relating to social competences:*

- PEU\_K01 The student can work in a group and understand the necessity of lifelong learning.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Familiar with the subject, program requirements and how to pass. General characteristics of CAD computer systems.	2
Lec 2	General characteristics of CAD computer systems design in energetic.	2
Lec 3	Design rules for electrical installations.	2
Lec 4	General characteristics of CAD software for the design of electrical installations.	2
Lec 5	Principles of lighting design and lighting design outdoor areas.	2
Lec 6	General characteristics of CAD software to design lighting.	2
Lec 7	Principles of design of low voltage electrical switchgear.	2
Lec 8	General characteristics of CAD software to design low voltage electrical switchgear.	2
Lec 9	The rules for creating project documentation.	2
Lec 10	General characteristics of CAD software to create project documentation.	2
Lec 11	Final test.	2
Total hours:		<b>22</b>

Form of classes - laboratory		Number of hours:
Lab 1	Presentation of the Rules of Procedure Health and Safety Laboratory. Establish rules for passing. General knowledge of the laboratory positions.	1
Lab 2	Hand and discuss topics of electrical installation projects. The introduction of electrical design data in a selected CAD program for designing electrical installations and execution of design calculations.	2
Lab 3	Production of results for a given electrical installation using a selected CAD program for the design of electrical installations.	2
Lab 4	Hand and discuss the topics of lighting projects. The introduction of lighting design data in a selected CAD program to design lighting and execution of design calculations.	2
Lab 5	Production of results for a given lighting design using a selected CAD program to design lighting.	2
Lab 6	Completion of the course.	2
Total hours:		<b>11</b>

TEACHING TOOLS USED
N1. Lecture with audio-visual technology, multimedia presentations.
N2. Discussion problematic.
N3. Computer Laboratory conducted for a group of students - each student with a separate computer.
N4. Checking messages in the form of oral or written.
N5. Preparation of project documentation.

EVALUATION OF SUBJECT LEARNING OUTCOMES 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)	PEU_W01 PEU_W02	Written test or check messages orally
P(W)	P=F1	
F1(L)	PEU_U01 PEU_U02 PEU_K01	Activity in laboratory classes
F2(L)	PEU_U01 PEU_U02	Evaluation of project documentation
P(L)	P=0.3F1 + 0.7F2	

PRIMARY AND SECONDARY LITERATURE
<b>PRIMARY LITERATURE:</b> [1] Markiewicz H., Urządzenia elektroenergetyczne, Wyd. 4, WNT, Warszawa 2008. [2] Markiewicz H., Instalacje elektryczne, Wyd. 8, WNT, Warszawa 2012. [3] Dołęga W., Kobusiński M., Projektowanie instalacji elektrycznych w obiektach przemysłowych. Zagadnienia wybrane., Oficyna Wydawnicza PWr, Wrocław 2009. [4] Current manuals CAD software contained on the website developers.
<b>SECONDARY LITERATURE:</b> [1] Praca zbiorowa, Poradnik inżyniera elektryka. Tom 3. WNT, Warszawa, 2005. [2] Wiatr J., Orzechowski M., Poradnik projektanta elektryka, wyd 5, Wydawnictwo Medium, Warszawa 2012.

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