

DESCRIPTION OF THE COURSES

- Course code: ARR2303
- Course title: Equipment and control standards in electrical installations
- Language of the lecturer: Polish

<i>Course form</i>	<i>Lecture</i>	<i>Classes</i>	<i>Laboratory</i>	<i>Project</i>	<i>Seminar</i>
<i>Number of hours/week*</i>	2	2	0	0	0
<i>Number of hours/semester*</i>	30	30	0	0	0
<i>Form of the course completion</i>	<i>Exam</i>	<i>Test</i>			
<i>ECTS credits</i>	6(4,2)				
<i>Total Student's Workload</i>	180				

- Level of the course (basic/advanced): basic
- Prerequisites: Mathematical analysis, Theory of electrical circuits.
- Name, first name and degree of the lecturer/supervisor:
Antoni Klajn, dr inż.
- Names, first names and degrees of the team's members:
Waldemar Dołęga, dr inż.
Kazimierz Herlender, dr inż.
Mirosław Kobusiński, mgr inż.
Małgorzata Bielówka, mgr inż.
Ireneusz Surówka, mgr inż.
- Year: 1..... Semester: 2.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):

Understanding of the physical phenomena in electrical equipment and installations.
Know-how of the basic parameters of electrical equipment and principles of designing.
Understanding of relations between construction of electrical apparatus and its operation, reliability as well as effectiveness.

- Form of the teaching (traditional/e-learning): traditional
- Course description:

Basic rules concerning planning and designing of electrical installations. Calculation of short circuit currents in electrical installations. Thermal effects of current. Low voltage switching apparatus. Over-current protection of load and wires in low-voltage installations. Over-voltage protection in electrical installations. Principles of designing of electrical installations. Supplying networks of LV load. Planning of electrical installations and calculation of equivalent power of the load. Control systems of the load.

- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Basic rules concerning planning and designing of electrical installations in buildings.	2
2. Calculation of 3-phase and 1-phase short-circuit currents in electrical installations.	2

3. Thermal effects of currents in normal and fault operation conditions.	2
4. Electric switching arc. Low voltage switches.	2
5. Low voltage switchgears. Wires in electrical installations.	2
6. Over-current protection of load and wires in electrical installations and principles of its design.	2
7. Selectivity of over-current protection in electrical installations.	2
8. Protection against over-voltages in electrical installations.	2
9. Earthing installation, principles of design and calculation.	2
10. Elements of installations in buildings. Planning of electrical installation in residential buildings, offices and industry.	2
11. Supplying systems of LV consumers.	2
12. Design of wiring and equipment in electrical installations.	2
13. Calculation of equivalent load and peak load in electrical installations.	2
14. Relay-based and digital control systems.	2
15. Control systems in electrical installations.	2

- Classes – the contents:

<i>Contents of the classes</i>	<i>Number of hours</i>
1. Calculation of 3-phase symmetrical short-circuit currents.	2
2. Calculation of 1-phase short-circuit currents in electrical installations.	2
3. Considering of electrical motors in short-circuit currents.	2
4. Thermal effects of current in normal and fault operation conditions.	2
5. Over-current protection of LV load.	2
6. Over-current protection of wires.	2
7. Design of phase-wires in electrical installations.	2
8. Design of protective wires and wires in equipotential systems.	2
9. Planning and design of switchgears, main and additional equipotential systems as well as earthing installation of the building.	2
10. Selectivity of the over-current protection in LV installations.	2
11. Design of wires in electrical installations.	2
12. Design of arresters in the over-voltage protection in installation in buildings.	2
13. Plans and schemas of installation.	2
14. Control systems in LV electrical installations.	2
15. Examples of typical solutions of the relay-based control systems.	2

- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
- Basic literature:

1. Markiewicz H.: Instalacje elektryczne, WNT, Warszawa, 2006.
2. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2005.

- Additional literature:

1. PN-IEC 60364 Instalacje elektryczne w obiektach budowlanych.
2. Norma SEP: *N SEP-E-002*. Wytyczne. Komentarz. “Instalacje elektryczne w obiektach budowlanych. Instalacje elektryczne w budynkach mieszkalnych.

Podstawy planowania. Centralny Ośrodek Szkolenia i Wydawnictw SEP,
Warszawa 2003.

- Conditions of the course acceptance/creditation:

Lecture: pass the exam

Classes: pass the test

* - depending on a system of studies