DESCRIPTION OF THE COURSES

- Course code: ELR2301
- Course title: Electrical devices 1
- Language of the lecturer: Polish

Course form	***Lecture***	***Classes***	***Laboratory***	***Project***	***Seminar***
*Number of hours/week**	*2*				
*Number of hours/semester**	*30*				
Form of the course completion	*test*				
ECTS credits	*2*				
Total Student's Workload	*60*				

- Level of the course (basic/advanced): basic
- Prerequisites: Basics of electrotechnique 1, Mathematical analysis 1
- Name, first name and degree of the lecturer/supervisor:
  Zbigniew Wróblewski, prof. dr hab. inż.
- Names, first names and degrees of the team's members:
  Henryk Markiewicz, prof. dr hab. inż.
  Antoni Klajn, dr inż.
  Kazimierz Herlender, dr inż.
  Waldemar Dołęga, dr inż.
  Mirosław Kobusiński, mgr inż.
- Year:...2..... Semester:.4.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
  Understanding of the physical phenomena in electrical equipment. Know-how of the basic parameters of electrical devices and principles of designing. Understanding of relations between construction and reliability as well as effectiveness of devices.
- Form of the teaching (traditional/e-learning): traditional
- Course description:

Electrical devices in production, transmission, distribution and consuming of the electrical energy. Standardisation and typification of equipment. Environmental conditions of operation of electrical devices. Short-circuits in power electrical systems. Electromagnetic , thermal and dynamical effects. Electrical switching arc and switching phenomena in electrical circuits. Over-voltages in electrical devices and its limitation. Low voltage switches. Supplying networks and elements of LV electrical installations. Principles of designing of electrical installations.

- Lecture:

Particular lectures contents	*Number of hours*
1. Basic definitions, notions and rated parameters of electrical equipment. Standardisation and typification. Environmental conditions of operation of electrical devices and its classification. Protection of electrical	

devices against environmental stress.	*2*
2. Short-circuits in power electrical networks. Fault current flows. Parameters of short-circuit elements and replace schemas of these circuits.	*2*
3. Calculation of fault current parameters, needful for design of power electrical devices.	*2*
4. Thermal effects of operation and fault currents in electrical devices. Exemplary calculations of thermal effects.	*2*
5. Electro-dynamical effects of short-circuit currents in electrical devices. Exemplary calculations.	*2*
6. Classification of over-voltages in power electric networks. Over-voltage protection in low-voltage and high voltage networks.	*2*
7. Switching phenomena in electrical networks and typical examples of switching over-voltages.	*2*
8. Electrical switching arc and principles of its extinguishing in DC and AC switching apparatus.	*2*
9. Classification of electrical low-voltage switches. Fuses and hand-operated switches.	*2*
10.Contactors and its application in basic control circuits.	*2*
11.LV power circuit breakers.	*2*
12. Residual current devices and its application.	*2*
13. Switchgears and basic elements of electrical installations.	*2*
14. Power electrical conductors and principles of its design in electrical installations.	*2*
15. Principles of design of electrical installations.	*2*

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

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

- Additional literature:

1. Maksymiuk J.: Aparaty elektryczne, WNT, Warszawa 1995
2. Poradnik inżyniera elektryka, Tom 2 i 3, WNT, Warszawa 1996

- Conditions of the course acceptance/credition: completion of the test

***** - depending on a system of studies