

DESCRIPTION OF THE COURSES

- Course code: ARR2301
- Course title: Electrical devices and Power Substation
- 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				
<i>Number of hours/semester*</i>	30				
<i>Form of the course completion</i>	test				
<i>ECTS credits</i>	2				
<i>Total Student's Workload</i>	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:
Kazimierz Herlender, dr inż.
- Names, first names and degrees of the team's members:
Jan Bujko, dr hab. inż., prof. P.Wr.
Antoni Klajn, dr inż.
Waldemar Dołęga, dr inż.
Mirosław Kobusiński, mgr inż.
- Year:....2..... Semester: 3.....
- 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.
Skills and competences: understanding of problems concerned power substations
- Form of the teaching (traditional/e-learning): traditional
- Course description:
Basic notions and definitions. Short-circuits in electrical power energy systems. Thermal and dynamical effects of electrical currents. Electrical switching arc and principles of its extinguishing. Low voltage switches. Basic elements of low-voltage installations. High-voltage switchgears. Power electric transformers, characteristic parameters and conditions its design. Basic configurations and constructional solutions of high-voltage power substations. Auxiliary devices in high-voltage power substations. Devices and arrangements of power stations control.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>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.</i>	2

2. <i>Short-circuits in power electrical networks. Fault current flows. Parameters of short-circuit elements and replace schemas of these circuits.</i>	3
3. <i>Thermal and dynamical effects of electrical currents.</i>	2
4. <i>Electrical switching arc and principles of its extinguishing in DC and AC switching apparatus.</i>	2
5. <i>Low-voltage switchgears.</i>	2
6. <i>Basic elements of electrical installations.</i>	3
7. <i>Principles of electrical installations design.</i>	3
8. <i>High-voltage switchgears and conditions its design.</i>	2
9. <i>Power electric transformers, characteristic parameters and conditions its design.</i>	1
10. <i>Basic definition, classification and constructional solutions of high-voltage power substations.</i>	2
11. <i>Configuration of medium and high-voltage power substations.</i>	3
12. <i>Auxiliary devices in high-voltage power substations.</i>	1
13. <i>Devices and arrangements of power stations control.</i>	2

- Classes – the contents: isn't concerned
- Seminars – the contents: isn't concerned
- Laboratory – the contents: isn't concerned
- Project – the contents: isn't concerned
- Basic literature:

1. Markiewicz H.: Urządzenia elektroenergetyczne, WNT, Warszawa, 2005.
2. Dołęga W.: Stacje elektroenergetyczne, Wydawnictwo Politechniki Wrocławskiej, Wrocław, 2007.
3. Praca zbiorowa: Poradnik inżyniera elektryka, Tom.2,3, WNT, Warszawa, 2005.

- Additional literature:

1. Praca zbiorowa pod redakcją W. Jabłońskiego: Sieci, instalacje i urządzenia elektroenergetyczne o napięciu powyżej 1kV. Poradnik inżyniera elektryka, projektanta i inwestora. Warszawa, Wydawnictwo Verlag Dashofer Sp.z.o.o., 2006.
2. Praca zbiorowa pod redakcją S. Kujszczyka: Elektroenergetyczne sieci rozdzielcze. Tom 1, 2. Warszawa, Oficyna Wydawnicza Politechniki Warszawskiej 2005.

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

* - depending on a system of studies