

## DESCRIPTION OF THE COURSES

- Course code: ELR1167
- Course title: Measurement of high voltage
- 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>	<i>1</i>		<i>1</i>		
<i>Number of hours/semester*</i>	<i>11</i>		<i>11</i>		
<i>Form of the course completion</i>	<i>w r i t t e n t e s t</i>		<i>r e p o r t s</i>		
<b><i>ECTS credits</i></b>					
<b><i>Total Student's Workload</i></b>					

- Level of the course (basic/advanced): advanced
- Prerequisites: Electrical Metrology, High Voltage Engineering
- Name, first name and degree of the lecturer/supervisor:  
Professor Janusz Fleszyński, D.Sc., Ph.D, B.Eng.
- Names, first names and degrees of the team's members:  
Adam Tymań, Ph.D, B.Eng.  
Maciej Jaroszewski, Ph.D, B.Eng.  
Krzysztof Wieczorek, Ph.D, B.Eng.
- Year: II..... Semester: 3.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):  
Specialization in high voltage measuring and testing techniques
- Form of the teaching (traditional/e-learning): traditional
- Course description: The course specializes in domains of high voltage measurements making up separate – with regards on one's specific – electric metrology. The lectures and laboratories acquaint the students with methods of high voltage measurements (direct voltages - D.C., alternating voltages - A.C. and impulse voltages) as well as with impulse current measuring techniques and with problem of partial discharges and their measurements on high voltage insulation. Also optoelectronics and digital techniques are considered.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
<i>1. Introduction to the matter of high voltage measuring techniques. DC voltage dividers, series resistor.</i>	<i>2</i>
<i>2. AC voltage dividers. Cooperation between capacitor divider and a voltage transformer.</i>	<i>1</i>
<i>3. The measurement of peak voltage.</i>	<i>1</i>
<i>4. Voltage dividing systems (resistor, capacitor and mixed resistor-capacitor) for impulse voltage.</i>	<i>2</i>
<i>5. The methods for impulse current measurements: high current resistor, Rogowski's coil, integrating systems.</i>	<i>1</i>
<i>6. The voltage and current optoelectronics measuring systems.</i>	<i>1</i>

7. <i>Partial discharges and their measurement. Digital PD instruments and measurements.</i>	2
8. <i>Partial discharges measurements on high voltage insulation diagnosis.</i>	1

- Classes – the contents:

- Seminars – the contents:

- Laboratory – the contents:

The syllabus of laboratory includes following practical tasks:

measurement of direct, alternating and impulse voltages, measurement of partial discharges, verification and calibration of measuring systems.

At laboratory tasks students are introduced to high voltage test systems, high voltage measuring systems and modern electronic apparatus.

- Project – the contents:

- Basic literature:

1. J. Wodziński, Wysokonapięciowa technika prób i pomiarów, Wydawnictwo Naukowe PWN, Warszawa, 1997.

2. Praca zbiorowa, Laboratorium wysokonapięciowe w dydaktyce i elektroenergetyce, J. Fleszyński (red.), Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 1999.

- Additional literature:

1. Praca zbiorowa, Technika badań wysokonapięciowych, R. Kosztaluk (red.), WNT, Warszawa, 1985.

2. Florkowska B., Florkowski M., Włodek R., Mechanizmy, pomiary i analiza wyładowań niezupełnych w diagnostyce układów izolacyjnych wysokiego napięcia, Wyd. JPPT PAN, Warszawa, 2001.

Selected scientific papers and leaflets concerning high voltage systems.

- Conditions of the course acceptance/creditation:

Completed laboratory tasks and reports, positive mark of written test.