DESCRIPTION OF THE COURSES

- Course code: ELR3304
- Course title: *ELECTRICAL METROLOGY 2*
- Language of the lecturer: *polish*

Course form	***Lecture***	***Classes***	***Laboratory***	***Project***	***Seminar***
*Number of hours/week**	*1*		*1*		
*Number of hours/semester**	*15*		*15*		
Form of the course completion	*Exam*		*Acceptance*		
ECTS credits	*1*		*1*		
Total Student's Workload	*30*		*30*		

- Level of the course (basic/advanced): *basic*
- Prerequisites: *Electrical Metrology 1*
- Name, first name and degree of the lecturer/supervisor:
  Zdzisław Nawrocki prof.
- Names, first names and degrees of the team's members:
  Jerzy BAJOREK PhD
  Jerzy BARTOSZEWSKI PhD
  Andrzej KAŁWAK PhD
  Jerzy LESZCZYŃSKI PhD
  Karol NOWAK PhD
  Krzysztof PODLEJSKI PhD
  Grzegorz KOSOBUDZKI PhD
  Daniel DUSZA PhD
  Wojciech GROTOWSKI PhD
  Piotr Madej PhD
- Year: II Semester: 4.....
- Type of the course (obligatory/optional): *obligatory*
- Aims of the course (effects of the course): Students knowledge will be in measurements range:

– active and reactive power in high voltage power net,
– resistance and impedance in bridge systems,
– voltages and currents by compensation methods,
– digital methods: voltage, phase shift, frequency and period,
– power loss of ferromagnetic materials.

- Form of the teaching (traditional/e-learning): *traditional*
- Course description:
- *Course contains: Reactive power measurement in 1 phase and 3 phase circuit. Active power measurement in high-tension system. Direct current resistance bridge, transformer bridge. Differential method in measuring voltage. Analog to digital and digital to analog converters, wattmeter, frequency metter.*
- Lecture:

Particular lectures contents	*Number of hours*
1. Reactive power measurement in 1 phase and 3-phase circuit.	*1*

2. Current and voltage transformer. Normalize transducer	*1*
3. Active power measurement in high tension system	*1*
4. Measuring of impedance and its component (RLC)	*2*
5. Voltage and current standards. Differential method in measuring voltage and current.	*1*
6. Introduction to digit method of measurement. Sampling, quantization and coding of signal	*2*
7. Digital to analog converters.	*2*
8. Analog to digital converters.	*2*
9. Digital voltmeter. Measuring of alternative current and voltage	*1*
10. Analogue and digital measuring systems.	*1*
11. Exam	*1*

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
  a) *Principle of chosen measuring methods for determination parameters of electrical object like current transformer, coil, operation amplifier, measuring transducer*
  b) *Differential method in measuring systems. Digital signal processing in measurement.*
- Project – the contents:
- Basic literature:
  1. Chwaleba A., Poniński M., Siedlecki A.:Metrologia elektryczna, WNT, W-wa 1994.
  2. Miernictwo elektryczne – Ćwiczenia laboratoryjne, praca zbiorowa pod redakcją D. Koczeli, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2001
  3. Stabrowski M., Miernictwo elektryczne. Cyfrowa technika pomiarowa, PWN, Warszawa, 2003.
  4. Tymański S.: Technika pomiarowa, WNT, Warszawa, 2007
  5. Piotrowski J., Podstawy metrologii, WNT, Warszawa, 2003
- Additional literature:
  1. Szumielewicz B., Słomski B., Styburski W., Pomiary elektroniczne w technice, Warszawa, WNT, 1982.
  2. Badźmirowski K., Karkowska H., Karkowski Z., Cyfrowe systemy pomiarowe, Warszawa, WNT, 1979.
  3. Orzeszkowski Z.: Podstawy metrologii elektrycznej, Wyd. Pol. Wrocławskiej, Wrocław 1981.
- Conditions of the course acceptance/credition: Exam
- ***** - depending on a system of studies