

DESCRIPTION OF THE COURSES

- Course code: ELR3370
- Course title: MEASUREMENT TECHNIQUES OF NON-ELETRIC VALUES
- 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		1		
<i>Number of hours/semester*</i>	22		11		
<i>Form of the course completion</i>	<i>written test</i>		<i>completion of lab exercises</i>		
ECTS credits	1		1		
Total Student's Workload	90				

- Level of the course (basic/advanced): basic
- Prerequisites: Electrical metrology
- Name, first name and degree of the lecturer/supervisor: Jerzy LESZCZYŃSKI, dr inż.
- Names, first names and degrees of the team's members:
Wojciech GROTOWSKI , dr inż.
Grzegorz KOSOBUDZKI, dr inż.
- Year:..... Semester:.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course):
- Form of the teaching (traditional/e-learning): traditional
- Course description: The course includes total problems related to measurement of non-electric values by electric methods. Construction, rules of functioning and characteristics of processing most frequently used measurement transformers are described as well as methods of measuring various non-electric values. The laboratory deals with tensometric measurements, pressure and flows measurements, thermal measurements, p-hmetric, conductrometric and optic measurements.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Processing non-electric values into electric signal – general problems.	2
2. Tensometric sensors, measurement of the twisting moment, forces measurements.	2
3. Measurements of the intensity of the flow of gases and liquids.	2
4. Pressure measurements.	2
5. P-hmetric and conductometric measurements.	2
6. Temperature measurements – temperature scale, methods.	2
7. Resistance and thermoelectric thermometers.	2
8. Methods of temperature measurements – measurements of solid states, gases and liquids.	2
9. Temperature measurements in industrial equipment.	2
10. Higroscopic measurements.	2
11. Measurements of chemical composition.	1
12. Colloquium	1

- Classes – the contents:

- Seminars – the contents:
- Laboratory – the contents:
 1. Temperature measurements – designating characteristics of transformers
 2. Tensometric measurements – transformers properties, examining forces transformers
 3. Pressure measurements – examining manometers
 4. Ph and liquid conductivity measurements
 5. Flow measurements
- 6. Examining contrast dependence on electric illumination.
 - Project – the contents:
 - Basic literature:
 1. Romer R., Miernictwo przemysłowe, PWN, Warszawa, 1970.
 2. Hagel R., Miernictwo wielkości nieelektrycznych metodami elektrycznymi, Cz. 1, Przetworniki i ich zastosowanie, Skrypt Pol. Śląskiej, 1982
 3. Hagel R., Miernictwo wielkości nieelektrycznych metodami elektrycznymi, Cz. 2, Przetworniki i ich zastosowanie, Skrypt Pol. Śląskiej, 1992
 4. Michalski L., Eckersdorf K., Kucharski J.: Termometria – przyrządy i metody. Polít. Łódzka 1998
 - Additional literature:
 1. Szumielewicz B., Słomski B., Stryburski W., Pomiarý elektroniczne w technice, WNT, 1982
 2. Zagajewski T., Malzacher S., Kwieciński A., Elektronika przemysłowa, WNT, Warszawa, 1975
 3. Pomiarý cieplne – praca zbiorowa. WNT 1995 cz. 1 i 2
 - Conditions of the course acceptance/creditation:

* - depending on a system of studies