DESCRIPTION OF THE COURSES

- Course code: ARR3317
- Course title: SENSORS AND CONVERTERS IN AUTOMATION
- 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					
ECTS credits	*1*		*1*		
Total Student's Workload	*30*		*30*		

- Level of the course (basic/advanced): basic
- Prerequisites: electrical measurements, theoretical electrotechnology, elements of electronics
- Name, first name and degree of the lecturer/supervisor: Jerzy LESZCZYŃSKI, Ph.D.
- Names, first names and degrees of the team's members: Grzegorz KOSOBUDZKI, Ph.D.
- Year: II Semester:. 3
- 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 lecture describes sensors and transformers applied in industrial measurements with particular respect to their dynamical properties, essential in the measurements system and automatic regulation. Mathematical models of transformers are presented, classes of the processed signals, methods of processing and estimation, optimisation and correction of dynamic properties of transformers. Methods of measuring dynamic characteristics of transformers and processing selected signals obtained from the transformers are described. Systems of transformers of electric values are described and methods of transmitting signals in the electroenergetic network.
- Lecture:

Particular lectures contents	*Number of hours*
1. Automatic control objects	1
2. Transfer functions	1
3. Ideal models of dynamic transfer functions	1
4. Models of real converters and sensors. Transducer of zero, first and second transfer function order.	2
5. Static and dynamic properties of sensors and transducers	2
6. Measurement circuits of active and passive sensors.	2
7. Basics elements of measurement transducers	1
8. Temperature sensors, current and voltage transducers	1
9. Power transducers	2
10. Energy transducer (meter), remote energy measurement	2
11. Test	1

- Classes – the contents:
- Seminars – the contents:

- Laboratory – the contents:
  - Dynamic properties of transducers study – unit step response
  - Determining phase and magnitude characteristics of input circuits
  - Determining frequency characteristic of current transducer.
  - Determining convert functions of temperature sensors
  - Determining convert functions of light sensors
  - Determining properties of proximity detectors
- Project – the contents:
- Basic literature:
  - Hagel R., Zakrzewski J., Miernictwo dynamiczne WNT 1984
  - Zajda Z., Żebrowski L., Urządzenia i układy automatyki PWr. Wrocław, 1993
  - Romer E., Miernictwo przemysłowe, PWN, 1978
- Additional literature:
- Conditions of the course acceptance/credition:

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