

## DESCRIPTION OF THE COURSES

- Course code: ARR3303
- Course title: Basic Electronics Engineering 2
- 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>15</i>		<i>15</i>		
<i>Form of the course completion</i>	<i>colloquium</i>		<i>note</i>		
<i>ECTS credits</i>	<i>1</i>		<i>1</i>		
<b><i>Total Student's Workload</i></b>	<i>30</i>		<i>30</i>		

- Level of the course (basic/advanced): basic  
Basic information about operational amplifier, stabilization power supply and introduction in digital technique.
- Prerequisites: course ARR 1301
- Name, first name and degree of the lecturer/supervisor: Piotr Madej / PhD
- Names, first names and degrees of the team's members:
 

Daniel Dusza	PhD
Andrzej Kałwak	PhD
Grzegorz Kosobudzki	PhD
Krzysztof Podlejski	PhD
Jarosław Krysiak	MSc.
- 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:  
Introduction in digital technique. Logical functions and their characteristics. Elementary logic elements: gates, flip-flop, decoder, multiplexer, counter, register.
- Lecture:

<i>Particular lectures contents</i>	<i>Number of hours</i>
1. Introduction. Operational amplifier and their parameters.	2
2. Operational amplifier: theory and practice. Idealized simple model. Typical configurations.	2
3. Stabilization of DC: principles, design and project.	
4. Introduction in the digital technique. Binary and decimal number. Logical function. Boole'an algebra.	
5. Logic elements: gates AND, OR, NOT, NAND, NOR. Logic truth table. Conversion of a gates. Decoder, multiplexer, demultiplexer, BCD-decoder.	2
6. RTL, TTL, ECL, NMOS, CMOS technic gates realization. Design and characteristics.	2
7. RS, J-K, D, D-latch, flip-flop synchronous circuits. Design, timing characteristics.	2
8. Colloquium	

	2
	2
	1

- Classes – the contents:
- Seminars – the contents:
- Laboratory – the contents:
- Project – the contents:
  1. Introduction. Organization.
  2. Instrumentation amplifier
  3. Analog and digital switch: bipolar and unipolar CMOS. Isolation switch.
  4. TTL and CMOS gates: NOR, NAND, NOT, Ex-OR. Decoder, multiplexer, demultiplexer.
  5. Flip-flop TTL circuits: RS, J-K Master-Slave, D, latch.
- Basic literature:
  1. Tietze U., Schenk C.: Układy półprzewodnikowe. WNT Warszawa 1996.
  2. Horowitz P., Hill W.: Sztuka elektroniki cz.I, WKŁ Warszawa 1997.
  3. Nadachowski M., Kulka Z.: Analogowe układy scalone. WKŁ Warszawa 1985.
  4. Baranowski J., Czajkowski G.: Układy elektroniczne. Cz.II. WNT Warszawa 1993.
  5. Chwaleba A., Moeske B.: Pracownia elektroniczna. Część II: Układy elektroniczne. WSP Warszawa 1983.
- Additional literature:
  1. Borkowski A.: Zasilanie urządzeń elektronicznych. WKŁ Warszawa, 1990.
  2. Rusek M., Pasierbiński J.: Elementy i układy elektroniczne w pytaniach i odpowiedziach. WNT Warszawa, 1991.
  3. Filipkowski A.: Układy elektroniczne analogowe i cyfrowe. WNT Warszawa, 1980
  4. Pieńkoś J., Turczyński J.: Układy scalone TTL w systemach cyfrowych. WKŁ W-wa 1980
- Conditions of the course acceptance/creditation: colloquium, 100% acceptance of laboratory classes.

\* - depending on a system of studies