

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Podstawy elektroniki 1**
 Name in English: **Basics of Electronics 1**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable):
 Level and form of studies: **1st level, part-time**
 Kind of subject: **obligatory**
 Subject code: **ELR043363**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	20				
Number of hours of total student workload (CNPS):	108				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	4				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	2.80				

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Has a basic knowledge of mathematics.
2. Has a basic knowledge of physics.
3. Has knowledge of the basic theory of electrical circuits
4. Is able to apply the knowledge of the above to analysis of linear circuits.
5. Is aware of their responsibility for their own work.

SUBJECT OBJECTIVES

- C1. Awareness of the importance use of electronic circuits in engineering practice.
 C2. Provides with the basic properties of electronic components.
 C3. Provides with the methods of the description of a model of electronic components and parameters used in the description.
 C4. To provide students with simple electronic circuits - applications of elements: □ analog linear and non-linear and digital.
 C5. Provide with the purpose and way of describing the operation of electronic circuits.
 C6. Provide with the methods: qualitative and quantitative analysis of the properties based on the properties of elements, use this analysis to some simple circuits.

SUBJECT EDUCATIONAL EFFECTS*relating to knowledge:*

- PEK_W01 Has basic knowledge in the area of work of electronic elements and describes them by the circuit model
 PEK_W02 Differentiates and analyses simple electronic systems – analog and digital, knows the basis of interaction between them
 PEK_W03 Knows the methods and means of using of analysis of properties of simple electronic systems

*relating to skills:**relating to social competences:*

- PEK_K01 Understands the need and knows the possibility of lifelong learning vocational skills development,

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Introduction, the scope of the subject. Passive elements, junctionless semiconductor devices.	2
Lec 2	Diodes. The structure of AC/DC adapters	2
Lec 3	Active linear four-pole.	2
Lec 4	Bipolar transistor – parameters, characteristics, polarization, basic linear work circuits, low-signal analysis. Transistor key.	2
Lec 5	Unipolar transistor – parameters, characteristics, polarization, basic linear work circuits, low-signal analysis. Transistor key.	2
Lec 6	The elements of the feed-back theory; the kinds of feed-back, their pros and contras. Ideal operational amplifier. The basic configurations of signal transducers with the operational amplifier	2
Lec 7	cont. The basic configurations of signal transducers with the operational amplifier. The real operational amplifier – parameters and their effect on the work of systems with the operational amplifiers	2
Lec 8	Generation of electric signals, the basis. Relaxation generator, two-terminal-pair network generator of sinusoidal wave, functional generator. Monolithic stabilizers of voltage and current.	2
Lec 9	Logical functors, realization and minimalization of logical functions. Basic combinatory circuit. Flip-flops in digital techniques.	2
Lec 10	Basic sequential circuits Final test.	2
Total hours:		20

TEACHING TOOLS USED
N1. Information traditional lecture, presentation of slides and/or transparencies.
N2. Consultation.
N3. Own independent work - self-study and preparation for the test.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F – forming (during semester) P – concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03 PEK_K01	Final test
P(w)	P=F1	

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE:
[1] Madej P., Zadania z rozwiązaniami z elementarnej techniki układowej w elektronice, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2014.
[2] Madej P., Ćwiczenia laboratoryjne z Podstaw Elektroniki, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2014.
[3] Tietze U., Schenk Ch., Układy półprzewodnikowe, WNT, Warszawa 2009
[4] Rusek M., Pasierbiński J., Elementy i układy elektroniczne w pytaniach i odpowiedziach, WNT, Warszawa 2006
[5] Kulka Z., Nadachowski M., Zastosowania wzmacniaczy operacyjnych, WNT, Warszawa 1986
SECONDARY LITERATURE:
[1] Pióro B., Pióro M., Podstawy elektroniki, cz. 1 i 2, Wyd. Szkolne i Pedagogiczne, Warszawa 1997
[2] Horowitz P., Hill W., Sztuka elektroniki, WKŁ, Warszawa 2003
[3] Kaźmierkowski M. P., Matysik J. T., Wprowadzenie do elektroniki i energoelektroniki, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2005
[4] Nowaczyk E., Nowaczyk J., Podstawy elektroniki: materiały pomocnicze do ćwiczeń projektowo-laboratoryjnych, Oficyna Wydawnicza PWr., Wrocław 1995
[5] Kalisz J., Podstawy elektroniki cyfrowej, WKŁ, Warszawa 1991
[6] Górecki P., Wzmacniacze operacyjne: podstawy, aplikacje, zastosowania, Wyd. BTC, Warszawa 2004

SUBJECT SUPERVISOR
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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ELR043363 - Basics of Electronics 1
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	K1ETK_W24	C.1 C.2 C.3 C.4 C.5 C.6	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2 N.3
PEK_W02	K1ETK_W24	C.1 C.2 C.3 C.4 C.5 C.6	Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2 N.3
PEK_W03	K1ETK_W24	C.1 C.4 C.5 C.6	Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2 N.3
PEK_K01	K1ETK_K04	C.1	Lec1 Lec2 Lec3 Lec4 Lec5 Lec6 Lec7 Lec8 Lec9 Lec10	N.1 N.2