STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Basics of Electronics		**1010642211010321631**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Mechatronics	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **1**	Classes: **-**	Laboratory: **-**	Project/seminars: **1**	**2**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of physics, electrical engineering and mathematical analysis
2	**Skills**	Ability to analyze and synthesize electrical circuits, perform basic operations on operator calculus and complex numbers. Ability to handle simulation tools. Ability to effectively self-study in a field related to a chosen field of study
3	**Social competencies**	He is aware of the need to expand his / her competence, readiness to cooperate within the team

Assumptions and objectives of the course:

Get acquainted with the construction, parameters and uses of basic electronic components. Get acquainted with the rules of operation of analog and digital electronic circuits. Acquire the ability to design electronic circuits at a basic level. Acquire skills in modeling simple electronic circuits.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Can describe principles of operation and parameters of basic electronic components, characterize the construction and application of basic analogue and digital electronic circuits - [K_W04 + K_W07 + K_W14 +++]
2. Can characterize the basic design criteria of electronic circuits - [K_W04 + K_W14 +++]

Skills:

1. Can use the knowledge of electronics to analyze the operation of basic analogue and digital electronic systems - [K_U01 + K_U03 ++]
2. Can specify the criteria necessary for the proper design of the electronic circuit at the basic level - [K_U01 ++ K_U03 +]

Social competencies:

1. Can think and act in an entrepreneurial way in the field of electronic circuits - [K_K02 ++]

Assessment methods of study outcomes

Colloquium classifying subject.

Evaluation of the project implemented in groups.

Course description

Update 2017.Labels (drawings, patterns, basic content) supplemented by simulation results. Properties and characteristics of basic electronic components and devices: passive components, semiconductor diodes, bipolar and field transistors, and their systems and applications. Semiconductor optoelectronic devices, their properties and application examples. Feedback in analog circuits. Operational amplifiers - ideal and real - their properties, parameters, applications. Division. Linear systems. Analog filters - properties, design principles and their frequency characteristics. Basic digital techniques: binary number system, logical states and logical operations, logic func- tions, truth tables, digital combinational and sequential circuits. Applications of digital circuits. TTL systems. Semiconductor memories: general classification, basic characteristics of selected types of memory. Selected simulation tools for analog and digital electronic circuits.

Basic bibliography:

1. U. Tietze, CH. Schenk, Układy półprzewodnikowe, WNT, Warszawa, 2009.
2. P. Horowitz, W. Hill, Sztuka elektroniki. Część 1 i 2, WKŁ, 2014
3. Z. Kulka, M. Nadachowski, Analogowe układy scalone, WKŁ, W-wa, 1980
4. P. Górecki, Wzmacniacze operacyjne, Wydawnictwo BTC, Warszawa, 2004
5. J. Kalisz, Podstawy elektroniki cyfrowej, WKiŁ, Warszawa, 2002

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Consultings of the course	2
3. Participation in projects	15
4. Preparing for projects	7

Student's workload

Source of workload	hours	ECTS
Total workload	39	2
Contact hours	32	1
Practical activities	22	1